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## Systematics of *Phasia* Latreille (Diptera: Tachinidae)

XUEKUI SUN & STEPHEN A. MARSHALL



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XUEKUI SUN & STEPHEN A. MARSHALL

Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1

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## Abstract

The genus *Phasia* (Diptera, Tachinidae) is redefined and the world species (excluding Neotropical species) are revised. Six species-groups are defined, and seventy-five species are described or redescribed, including 31 new species. Revised host lists and distribution maps are given.

Fifteen generic names are treated as new synonyms of *Phasia*: *Akosempomyia* Villeneuve, *Alophorophasia* Townsend, *Androeuryps* Beneway, *Besserioides* Curran, *Bogosiella* Villeneuve, *Campbellia* Miller, *Efftayloria* Malloch, *Epaulophasia* Townsend, *Heyneophasia* Townsend, *Kosempomyia* Villeneuve, *Paraphasiana* Townsend, *Tayloria* Malloch, *Trichophasia* Townsend, *Xanthotrichius* Townsend and *Xiphophasia* Townsend.

The following new species are described: *Phasia africana*, *P. australiensis*, *P. brachyptera*, *P. cana*, *P. clavigralla*, *P. bifurca*, *P. cylindrata*, *P. distincta*, *P. faceta*, *P. frontata*, *P. furcata*, *P. japonensis*, *P. kuodi*, *P. lauta*, *P. malaisei*, *P. malayana*, *P. mathisi*, *P. minima*, *P. nigromaculata*, *P. rotundata*, *P. serrata*, *P. siberica*, *P. sichuanensis*, *P. singuliseta*, *P. subnitida*, *P. sumatrana*, *P. transvaalensis*, *P. triangulata*, *P. wangi*, *P. woodi* and *P. yunnanica*.

The following new synonyms are proposed: *P. umbrifera* (Wulp), *P. occidentalis* (Brooks), *P. opaca* (Coquillett), *P. polita* (Brooks), *P. alaskensis* (Brooks) and *P. umbrosa* (Wulp) are junior synonyms of *P. aeneoventris* (Williston); *P. nigra* (Brooks) is a junior synonym of *P. albipennis* (Brooks); *P. karczewskii* (Draber-Mońko) is a junior synonym of *P. aldrichii* (Townsend); *P. splendida* (Coquillett) and *P. meliceris* (Reinhard) are junior synonyms of *P. aurulans* Meigen; *P. cockaynei* (Miller) and *P. lancifer* (Malloch) are junior synonyms of *P. campbelli* (Miller); *P. peruviana* (Townsend), *P. pollinosa* (Brooks), *P. auricaudata* (Brooks) and *P. dimidiata* (Townsend) are junior synonyms of *P. chilensis* (Macquart); *P. basalis* (Malloch), *P. hyalis* (Malloch) and *P. nigrihirta* (Malloch) are junior synonyms of *P. lepidofera* (Malloch); *P. bancrofti* (Paramonov) is a junior synonym of *P. normalis* (Curran); *P. celer* (Townsend) and *P. argentifrons* (Brooks) are junior synonyms of *P. purpurascens* (Townsend); *P. fumosa* (Coquillett), *P. nitida* (Coquillett), *P. phasioides* (Coquillett), *P. pulvereae* (Coquillett), *P. furva* West and *P. brevineura* West are junior synonyms of *P. robertsonii* (Townsend); *P. chrysis* (Malloch), *P. aureiventris* (Curran), *P. costalis* (Malloch), *P. nigrisquama* (Malloch) and *P. discalis* (Malloch) are junior synonyms of *P. rufiventris* (Macquart); *P. lativentris* (Malloch) is a junior synonym of *P. sensua* (Curran).

A cladistic analysis of *Phasia*, based on fifty-one characters, is presented and the zoogeography of the genus is discussed.

**Key words:** *Phasia*, revision, phylogeny, zoogeography, new species.

## 1. Introduction

The Phasiinae, a large and morphologically diverse subfamily of Tachinidae, includes nine tribes according to Herting (1984). The genus *Phasia* Latreille, one of the largest genera in the subfamily Phasiinae, belongs in the tribe Phasiini and has a worldwide distribution. It is of particular interest to economic entomologists because *Phasia* species parasitize a

number of nymphal or adult Heteroptera, including pests of potential economic significance such as *Lygus lineolaris* (Palisot de Beauvois 1818), a common and widely distributed oilseed and alfalfa pest, and *Dysdercus* spp., which attack cotton throughout the world.

The primary purpose of this study is to reclassify the genus *Phasia* based on phylogenetic principles and provide keys for the identification of species from the Nearctic, Palaearctic, Afrotropical, Australian and Oriental regions. An updated list of hosts and associated *Phasia* species is provided.

### 1.1. Historical classification of *Phasia*

The taxonomy of *Phasia* is confusing and has had a complex history, with extensive debate about the type species (*Bull. zool. Nomencl.* **22**: 243-245, **23**: 9-11, 134-144, 196-197, and **24**: 68-69, 70-72). The type species of *Phasia* Latreille, *Conops subcoleopratus* Linnaeus, 1767, was fixed by the ICZN under Opinion 896 (1970, *Bull. zool. Nom.*, **26**: 196-199).

The most extensive recent treatment of *Phasia* is that of Draber-Mońko (1965) on the Palaearctic species. Based on external and genitalic characters, she recognized 7 subgenera and 21 species including 10 new species. Herting (1984) catalogued 2 subgenera (*Phasia* and *Hyalomya* Robineau-Desvoidy) and 21 valid species in the Palaearctic region. Ziegler (1994) revised the central European species of the subgenus *Hyalomya*. He synonymised *Phasia theodori* (Draber-Mońko) with *Phasia mesnili* (Draber-Mońko), and grouped the species using the female sheath (sternite VII), but made little use of other useful morphological characters such as male terminalia.

Oriental *Phasia* are still poorly known, with the limited material available mainly collected from the northern Oriental region. Two species, *Phasia pusilla* Meigen and *Phasia indica* (Mesnil) occur in Pakistan and northern India but not farther eastward and southwards (Crosskey 1976). *Phasia godfreyi* (Draber-Mońko) was described from Laos by Draber-Mońko (1964a) based on a single male specimen.

The first Australian species was described by Macquart (1851), but Malloch (1929, 1930a, 1930b) was the first dipterist to work extensively on the Australian Phasiinae. He described 10 species, all placed in the genus *Hyalomya*. Miller (1923) described a new genus *Campbellia* Miller [= *Phasia*] and two new species from New Zealand, giving a classification followed by Dugdale (1969) in his revision of the New Zealand genera of Tachinidae. Curran (1927) described *Catharosia varicolor* Curran [= *Phasia varicolor*], a parasitoid of *Dysdercus sidae*, and later designated it as the type species of the new genus *Besserioides* Curran [= *Phasia*] (Curran 1938). Paramonov (1958) added two other species to this genus. Crosskey (1973) verified all Australian species and assigned them to three subgenera (subg. *Mormonomya* Brauer & Bergenstamm, *Alophorella* Townsend and

*Hyalomya*). Two Australian species were left as unplaced (Crosskey 1973). *Campbellia* and *Besseriodes* were treated as valid genera by Crosskey (1973) and Cantrell and Crosskey (1989).

The first species to be described from the Afrotropical region was *Phasia argentifrons* Walker in 1849. Later, Loew (1852), Schiner (1869a), Brauer and Bergenstamm (1891), Bezzi (1908), Speiser (1910), Villeneuve (1923, 1935), and Curran (1936), described many new species under different generic names. Emden (1945) examined most of the types, and recognized only 5 valid species and listed many new synonyms. Mesnil (1953) added another species, *Phasia jeanneli*, to the Afrotropical fauna. *Phasia jeanneli* was redescribed by Draber-Moňko (1964b). Crosskey (1980) catalogued the six Afrotropical species into two subgenera, namely *Alophorella* and *Mormonomya*.

Coquillett (1897) was first to revise the North American species of *Phasia*. He recognized two genera, *Phorantha* Rindani and *Allophora* Mik. The most recent revision of North American species of *Phasia* [termed the *Phasia* complex] was that of Brooks (1945), including 12 genera and 23 species. Brooks followed Townsend's (1938b) generic definition, and his revision is now outdated and misleading due to the recognition of colour morphs as different species. Sabrosky and Arnaud (1965) catalogued all described Nearctic species into 6 genera. Recently, Wood (1987b) treated Brooks' *Phasia* complex as a single genus, *Phasia* Latreille, with 3 subgenera, *Hyalomya*, *Paraphorantha* Townsend and *Phasia* s.str.

Neotropical species of *Phasia* were described by Wulp (1892), Brauer (1898), Townsend (1897a, 1897b, 1927, 1929, 1934, 1937, 1939, 1940) and Aldrich (1934) under different generic names. Guimarães (1971) followed Townsend's system and divided *Phasia* into several genera. Revision of the Neotropical *Phasia*, although badly needed, is beyond the scope of the present work.

## 1.2. Biology of *Phasia*

Almost all species of *Phasia* are endoparasitic on bugs (Insecta: Heteroptera), and are characterised by modifications of abdominal segments for grasping and holding victims, and a sharp stylet for puncturing. The victim is usually held or controlled by the legs. The puncturing structures of *Phasia* are formed from the last sternites of the abdomen and are called the piercing ovipositor (sternite VIII) and sheath (sternite VII). The parasitic behaviour has not been well studied. R.C. Shannon described the behaviour of an undescribed Neotropical species of *Phasia* as follows: "The one with the Reduviid was collected while in the act of ovipositing, the bug sitting on the ground with wings outspread and absolutely motionless as if hypnotized" (from R.C. Shannon, 1932 collecting label).

Female adults of *Phasia* can lay several eggs into the body of a host, but usually only one larva survives. Dupuis (1963) found one *Phasia hemiptera* (Fabricius) egg in the tho-



racic muscle of *Palomena prasina* (Linnaeus) (Pentatomidae), and five *Phasia obesa* (Fabricius) eggs in the mesothoracic muscle of *Beosus maritimus* (Scopoli) (Lygaeidae), but no direct parasitism of these species has been observed (Dupuis 1963).

*Phasia* eggs do not hatch immediately. Dupuis (1963) provided some detailed data: *P. hemiptera* eggs incubated from 52 hours to 91 hours; *Phasia subcoleoprata* (Linnaeus) eggs 47 hours; *P. obesa* eggs about 71 hours, *Phasia pusilla* (Meigen) eggs about 48 hours and *Phasia barbifrons* (Girschner) eggs about 44 hours. Before hatching, the mature embryo needs to turn 180° before breaking the egg shell (Dupuis 1963).

Larvae usually develop for about 2 weeks in the host's body, and then exit from the host for pupation. Adults emerge 2.5-4.0 weeks after pupation. Like other tachinid flies, male emerge earlier than females. Mating occurs within 48 hours of male emergence (Dupuis 1963). Maximum adult longevities are: 21 days for *P. hemiptera* females; 31 days for *P. subcoleoprata* males and 29 days for females; 19 days for *P. obesa* males and 16 days for females; 10 days for *P. pusilla* females (Dupuis 1963). In the field, adults of *P. hemiptera* and *P. aurigera* (Egger) can survive 15 days and disperse 250-900m (Dupuis 1985).

*Phasia obesa* and *P. aurigera* overwinter in the host's body as a first or second instar larva (Dupuis 1963), but overwintering stages are unknown for most species.

Most *Phasia* species are polyvoltine. *P. hemiptera* and *P. subcoleoprata* are bivoltine (Rubtzov 1947). The phenologies of *Phasia* species correspond closely to those of their hemipteran hosts. In Europe, the first generation of *P. hemiptera* parasitises *Tropicoris rufipes* (Linnaeus) [= *Pentatoma rufipes*] (Pentatomidae) in spring, and the second one starts to attack *Palomena prasina* (Linnaeus) (Pentatomidae) in autumn (Dupuis 1963). *P. subcoleoprata* can successfully develop in *Eurygaster integriceps* Put. (Scutelleridae) and *Dolycoris baccarum* (Linnaeus) (Pentatomidae) (Kamenkova 1956). In southern California, *Phasia aldrichii* (Townsend) attacks *Nysius raphanus* Howard (Lygaeidae) in the spring, and its second generation parasitises *Geocoris* spp. (Lygaeidae) (Clancy and Pierce 1966). Day (1995) reported that there are two generations per year of *Phasia robertsonii* (Townsend) in northwestern New Jersey. In spring to early summer, the first generation usually attacks grass-feeding mirids, such as *Leptopterna dolabrata* (Linnaeus), *Stenotus binotatus* (Fabricius) and *Megaloceroea recticornis* (Geoffroy), most of which are univoltine. In October, the second generation developed exclusively in *Lygus* spp. (Miridae). Some widespread species, such as *P. obesa*, *P. pusilla*, and *P. hemiptera* may be trivoltine in temperate regions (Dupuis 1963).

The abundance of *Phasia* varies from species to species and year to year. The most common species such as *P. pusilla*, *P. hemiptera*, *P. aeneoventris*, *P. robertsonii*, *P. aldrichii* and *P. obesa*, are sometimes easily collected in large numbers during short periods. The more rarely collected species, such as *P. godfreyi* and *P. multisetosa* (Villeneuve), are known from very few specimens. Townsend (1897b) reported that *Hyalomyia ecitonis* Townsend (= *Phasia ecitonis*) occurred in large numbers over swarm raids of army ants

*Eciton foreli* (= *burchellii*) in southern Mexico. Rettenmeyer (1961) also found this species in large numbers over swarm raids of both *Eciton burchellii* (Westwood) and *Labidus praedator* (F. Smith) in Panama, but unfortunately, no host was recorded. For unknown reasons, *Phasia ecitonis* is abundant in the dry season and early rainy season and then rapidly decreases in abundance (Rettenmeyer 1961). We have observed males and females of *Phasia ecitonis* perching on litter and vegetation along *Eciton burchellii* swarm fronts on the slopes of Rincón de la Vieja, Costa Rica. Numerous coreids were noted running away from the advancing army ant raid, and it is presumed that *Phasia ecitonis* takes advantage of the activity around the swarm front to find exposed hosts (although no actual parasitism was observed due to the rapid flight of *Phasia ecitonis* and low light conditions).

With a few exceptions *Phasia* species parasitise Hemiptera, but tend to be "generalists" in comparison with Hymenoptera parasitoids. *P. obesa*, a well-studied species, is recorded from 8 species in 4 families (Dupuis 1963, Draber-Moňko 1965); *P. pusilla* is recorded from 13 species in 4 families (Dupuis 1963, Draber-Moňko 1965); *P. robertsonii* is recorded from 11 species in 3 families including 8 species of mirids; *P. aldrichii* is recorded from 8 species in 2 families.

Parasitism rates of the few *Phasia* species that are known indicate that they occur in very small numbers compared to their hosts and are therefore of little or no economic importance (Clancy and Pierce 1966). Painter (1929) found about 2-4% of overwintering *Lygus lineolaris* were parasitised by *Alophora opaca* Painter [= *Phasia robertsonii*] in Ontario, but Clancy and Pierce (1966) found a parasitism rate of less than 1% in New Jersey during 1962-1964. Medler (1961) reared 10 specimens of *Alophorella aeneoventris* and *A. opaca* [misidentification, both species = *Phasia robertsonii*] from more than 500 *Lygus lineolaris* in Wisconsin. Clancy and Pierce (1966) observed that about 9% of adult females of *Nysius raphanus* and about 11% of *Geocoris* adults were parasitised by *Phasia aldrichii* in the spring of 1964. We found that the parasitism rate of *Lygus lineolaris* by *Phasia robertsonii* was less than 1% in Guelph, Ontario. Day (1995) conducted a study in northwestern New Jersey during 1980-1990, and found the parasitism rates of mirids by *Phasia robertsonii* to be only 1.8%.

According to Dupuis (1963), the natural enemies that regulate *Phasia* populations, include undetermined spiders (Araneae) as predators of *Phasia obesa* (Dupuis 1963); *Phymata americana* Melin (Hemiptera, Phymatidae) as a predator of *Phasia aldrichii* (Balduf 1943); *Dysmachus trigonus* (Mg.) (Diptera, Asilidae) as a predator of *Phasia hemiptera* (Hobby 1931); and *Dasyproctus bipunctatus* (Lep.) (Hymenoptera, Sphecidae) as a predator of *Phasia nasuta* (Loew) and *Phasia nigrofimbriata* (Villeneuve) (Cuthbertson 1937). We know of no parasitoids that attack *Phasia*.

## 2. Material and methods

### 2.1. Sources of material

Over 12,000 specimens of *Phasia*, including most types were examined. The following list indicates the collections (or museums) that were sources of material and the abbreviations used throughout this paper.

**AMSA** Australian Museum, 6-8 College Street, Sydney, N.S.W. 2000, AUSTRALIA.

**AMNH** Department of Entomology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024, USA.

**ANIC** Australian National Insect Collection, Division of Entomology, CSIRO, P.O. Box 1700, Canberra, ACT. 2601, AUSTRALIA.

**BIRL** USDA Beneficial Insects Research Laboratory, 501 S Chapel Street, Newark, DE 19713, USA.

**BLKU** Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University, Ropponmatsu, Fukuoka 810, JAPAN.

**BMNH** Department of Entomology, The Natural History Museum, Cromwell Road, London, England SW7 5BD, UNITED KINGDOM.

**BPBM** Department of Entomology, Bernice P. Bishop Museum, 1525 Bernice Street, Honolulu, HI 96819, USA.

**CASC** Department of Entomology, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118, USA.

**CNCI** Canadian National Collection of Insects, Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa, Ontario K1A 0C6, CANADA.

**CUIC** Cornell University Insect Collection, Department of Entomology, Cornell University, Ithaca, NY 14853, USA.

**DEBU** Department of Environmental Biology, University of Guelph, Guelph, Ontario N1G 2W1, CANADA.

**DEIC** Projekt Entomologie, Deutsches Entomologisches Institut, Postfach 100238, D-16202 Eberswalde, GERMANY.

**IZAS** Insect Collection, Institute of Zoology, Chinese Academy of Sciences, 19 Zhongguancun Road, Haidian, Beijing 100080, P.R. CHINA.

**KSUC** Department of Entomology, Kansas State University, Manhattan, KS 66506, USA.

**LACM** Los Angeles County Museum of Natural History, Los Angeles, CA 90007, USA.

**MNHN** Entomologie générale et appliquée, Musée National d'Historie Naturelle, 45, rue de Buffon, Paris 75005, FRANCE.

**MRAC** Section d'Entomologie, Musée Royal de l'Afrique Centrale, Leuvenseleeweg 13, B-3040 Tervuren, BELGIUM.

**MVNH** Museum of Victoria Natural History, 71 Victoria Crescent, Abbotsford, Victoria,

3067 AUSTRALIA.

**NIHJ** Department of Medical Entomology, National Institute of Health, Toyama 1-23-1, Shinjuku-ku, Tokyo, 162, JAPAN.

**NMBZ** The National Museum and Monuments, Centenary Park, Bulawayo, P.O. Box 240, ZIMBABWE.

**NMSA** Natal Museum, Private Bag 9070, Pietermaritzburg 3200, SOUTH AFRICA.

**NSWA** Biological and Chemical Research Institute, New South Wales Agriculture, PMB10, Rydalmere, N.S.W. 2116, AUSTRALIA.

**NZAC** New Zealand Arthropod Collection, Ko Te Aitanga Pepeke O Aotearoa, Landcare Research New Zealand Ltd, Private Bag 92170, Auckland, NEW ZEALAND.

**QDPC** Department of Primary Industries, Entomology Branch Insect Collection, Meiers Road, Indooroopilly, Queensland, 4068 AUSTRALIA.

**ROME** Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6, CANADA.

**SAMA** South Australian Museum, North Terrace, Adelaide, South Australia 5000, AUSTRALIA.

**SEMC** Snow Entomological Museum, Department of Entomology, The University of Kansas, Lawrence, KS 66045-2106, USA.

**SMNS** Staatliches Museum für Naturkunde, Rosenstein 1, D-70191 Stuttgart, GERMANY.

**TAMU** Insect Collection, Department of Entomology, Texas A & M University, College Station, TX 77843, USA.

**UQIC** Insect Collection, Department of Entomology, University of Queensland, Brisbane, Queensland 4072, AUSTRALIA.

**USNM** Department of Entomology, U.S. National Museum of Natural History, Washington, DC 20560, USA.

**WAMP** Western Australian Museum, Francis Street, Perth, Western Australia 6000, AUSTRALIA.

**ZMHB** Museum für Naturkunde der Humboldt Universität zu Berlin, Bereich Zoologisches Museum, Invalidenstrasse 43, 1040 Berlin, GERMANY.

**ZMPA** Instytut Zoologii, Polska Akademia Nauk, ul. Wilcza 64, 00-679 Warszawa, P.O. Box 1007, POLAND.

## 2.2. Specimen Preparation

Most specimens of *Phasia* examined in this study were mounted on pins. Card-mounted specimens were removed using water or ethanol, then re-mounted on pins. Male terminalia were studied after removal of the whole abdomen and maceration in warm 10% NaOH, following the procedures outlined in O'Hara (1982). After examination and illustration, the terminalia were stored in glycerine in microvials pinned below the specimens.

### 2.3. Phylogenetic Reconstruction

Phylogenetic reconstruction followed the principles and methods of cladistic analysis (Hennig 1966). Character states were polarized into plesiomorphic (ancestral) and apomorphic (derived) characters through outgroup comparison (Watrous and Wheeler 1981, Maddison et al. 1984). As the phylogenetic position of *Phasia* within the subfamily Phasiinae is uncertain, and the exact sister group relationship still undetermined, the remaining genera of Phasiinae, such as *Ectophasia* Townsend and *Gymnosoma* Meigen, were taken as a broad functional outgroup.

The following weighting concept is used, following Marshall (1987): Unique characters thought to be very strong evidence for monophyly were coded as high weight (+++). Characters uniquely derived or with minimal homoplasy in the ingroup but also present in one or more outgroups were coded as medium weight (++). Medium weight characters can still provide strong evidence for monophyly, even though they are homoplastic in the Phasiinae. The lowest weight (+) category includes characters of equivocal polarity and characters apparently subject to repeated homoplasy as reflected in their repeated derivation in both ingroup and outgroups. .

HENNIG86, a PC-DOS computer program for phylogenetic analysis (Farris 1988), was used to analyse the data. The weighting system was interpreted as 3 (+++), 2 (++), 1(+) using "ccode" command. Analyses were performed using the "mhennig\*" and "bb" commands. A Nelson consensus tree was generated for all the species from the trees stored in memory following the "mhennig\*" and "bb" operations. The Nelson consensus tree (Figure III-1 and Figure III-2) was imported into CLADOS 1.2 (Nixon 1992) for editing and printing.

### 2.4. Character Analysis

Fifty-one characters were used in the phylogenetic analysis, and for establishing the monophyly of *Phasia*. For each character, the plesiomorphic (P) and apomorphic (A for each binary character, A1, A2, A3 ... for multistate characters) states are described below.

1. **Head shape** ( $\sigma$ ) (+). Compressed anteriorly (P); spherical or nearly so (A). This is a sexually dimorphic character, found in some males of *Phasia*; all females have a spherical head. A compressed head is also found in *Ectophasia* Townsend, *Trichopoda* Berthold.

2. **Width of frons** ( $\sigma$ ) (++). Eyes touching or separated by a distance less than ocellar width (P); single ocellus  $\leq$  width of frons  $<$  ocellar triangle (A1); Width of frons  $>$  = ocellar triangle (A2). This is an ordered multistate character (P  $\rightarrow$  A1  $\rightarrow$  A2).

3. **Shape of fronto-orbital plate** (+++). Inconspicuous or not swollen (P); conspicuously swollen (A). The derived state is only found in the *P. barbifrons* species-group, and thought to be strong evidence for monophyly.

4. **Fronto-orbital plate** (+++). Over 3 rows of hairs or entirely haired laterally (**P**), only 1-3 rows of hairs laterally (**A1**), entirely bare laterally (**A2**). This is an ordered multi-state character ( $P \rightarrow A1 \rightarrow A2$ ). Both states A1 and A2 are considered strongly indicative of monophyly.

5. **Dorsal facets of eye** (+++). Size equal to ventral facets (**P**); larger than ventral facets (**A**). The plesiomorphic state of this character is universal in the outgroup. This character may relate to the adult swarming behaviour of *Phasia*.

6. **Inner side of eyes** (++) . Divergent (**P**); parallel or nearly so (**A**). The apomorphic state of this character occurs in the *P. varicolor* species-group.

7. **Hairs of parafacial** (++) . Absent (**P**); present (**A**).

8. **Lower margin of face** (+++). Perpendicular, not projecting (**P**); projecting, visible in profile (**A1**); strongly projecting, almost forming a right angle with face (**A2**). This is an ordered multistate character and sexually dimorphic.

9. **Width of parafacial** (++) . At least half width of flagellomere (**P**); extremely narrow and much less than half width of flagellomere (**A**). The plesiomorphic state is widespread in the outgroup and is found in most species of *Phasia*.

10. **Genal hairs** (+). White only (**P**); black or mixture of black and white (**A**). The apomorphic state occurs sporadically in *Phasia* and is considered highly homoplastic.

11. **Sublunular bulla** (+++). Indistinct (**P**); rounded or knob-like and brilliantly shining (**A**). As in the majority of Phasiinae, the sublunular bulla of most species of *Phasia* is inconspicuous. The apomorphic state is considered highly indicative of monophyly.

12. **Length of first flagellomere** (++) . Short (less than 2.0 times length of pedicel, or much less than half facial height) (**P**); long (usually longer than 2.0 times length of pedicel, or over half of facial height) (**A**).

13. **Length of oral opening** (+). Less than 2.5 times longer than wide (**P**); more than 2.5 times longer than wide (**A**).

14. **Occipital hairs** (+). White only (**P**); black or mixture of black and white (**A**).

15. **Pruinosity of mesonotum** (++) . Absent, or thinly pruinose (**P**); strongly pruinose, forms pruinose vittae or spot (**A**).

16. **Scale-like setae** ( $\sigma$ ) (+++). Absent (**P**); present (**A**). The scale-like setae are found on the basicosta, femur, notopleuron, postpronotum, and pleuron only in the males of some species in the *P. argentifrons* species-group.

17. **Katepisternal setae** (+). Two or more (**P**); one or absent (**A**). The apomorphic state is considered independently derived several times in *Phasia*.

18. **Colour of Scutellum** (+). Black (**P**), yellow or yellowish brown (**A**).

19. **Number of marginal scutellar setae** (++) . Two pairs (**P**); one pair (**A**).

20. **Subscutellum** (+++). Not prominent (**P**); very prominent (**A**). Some species of *Phasia* have a very prominent subscutellum, which extends well beyond the scutellar apex. This apomorphic state is unique for the *P. argentifrons* species-group and is considered highly indicative of monophyly.

21. **Basicosta** (+). Yellow (**P**); brown to black (**A**).
22. **Wing colour of male** (+). Pictured or infuscated (**P**); hyaline or most individuals hyaline (**A**). Wing colour is extremely varied among and within species of *Phasia*. This sexually dimorphic character was overemphasized by previous authors (e.g. Coquillett 1897, Brooks 1945).
23. **Length of petiole of apical cell** (+). Short, usually less than 0.25 times as long as preceding section of  $R_{4+5}$  (**P**); long, usually over than 0.25 times as long as preceding section of  $R_{4+5}$  (**A**).
24. **Angle at which M meets  $R_{4+5}$**  (+). Acute angle (**P**); almost at right angle (**A**). The apomorphic state of this character is also found in other genera, such as *Gymnosoma* Meigen, but is considered to be independently derived in *Phasia*.
25. **Abdomen shape** (++) . Subovate (**P**); slender, sides subparallel (**A**). The subovate abdomen occurs in some species of the ingroup, but is also found in many outgroup genera, such as *Elomyia* Robineau-Desvoidy, *Xysta* Meigen and most genera of Gymnosomatini (*sensu* Tschorsnig, 1985).
26. **Colour of abdominal tergites** (+). Yellow, or black with yellow area and spot (**P**); Black only (**A**). The colour pattern of abdominal tergites is varied among and within species of Phasiinae. The apomorphic state is of sporadic occurrence in *Phasia*.
27. **Pruinosity of abdominal tergites** (+). Present (**P**); absent (**A**).
28. **Hair spots of tergite IV and / or tergite V** (+). Indistinct (**P**); distinct (**A**).
29. **Notch of syncercus posteriorly** ( $\sigma$ ) (+). Absent, or slightly notched only (**P**); present (**A**). The notched syncercus has arisen several times in *Phasia* and is subject to homoplasy.
30. **Apex of syncercus** ( $\sigma$ ) (+). Not or slightly bent downward (**P**); strongly bent downward (**A**).
31. **Shape of cercus** ( $\sigma$ ) (+). Short and broad, length less than 1.5 times width (**P**); slender or long-triangular, length over 1.5 times width (**A**). The cercus in *Ectophasia* and most species of *Phasia* is short and broad; sometimes rectangular or broadly triangular.
32. **Relative length of cercus and surstylus** ( $\sigma$ ) (+). Surstylus not longer than cercus (**P**); surstylus longer than cercus (**A**).
33. **Shape of surstylus** ( $\sigma$ ) (+). Straight or slightly bent (**P**); strongly arched (**A**).
34. **Apex of surstylus** ( $\sigma$ ) (+). Slender, not broadened (**P**); very broad (**A**).
35. **Hairing of phallus** ( $\sigma$ ) (++) . Present (**P**); absent (**A**). The phallus in *Ectophasia* Townsend and some species of *Phasia* has fine white hairs dorsally that vary in density and number.
36. **Length of phallus** ( $\sigma$ ) (+). Long, distinctly longer than hypandrium (**P**); short (**A**).
37. **Epiphallus** ( $\sigma$ ) (+). Absent or not distinctly sclerotized (**P**); sclerotized, well developed (**A**); The epiphallus is well developed and forms a special structure in a few species of *Phasia*, but it is indistinct in *Ectophasia* and most species of *Phasia*.
38. **Branches of distiphallus** ( $\sigma$ ) (++) . Absent (**P**); present (**A**). The distiphallus of a

few species of *Phasia* is divided into 2-3 branches, but this character state seems to have evolved more than once in the *P. hemiptera* species-group.

39. **Degree of distiphallus sclerotization** ( $\sigma$ ) (+). Partly to well sclerotized (**P**); membranous (**A**). Among the species having the plesiomorphic state, the degree of the distiphallus sclerotization is quite variable.

40. **Apex of distiphallus** ( $\sigma$ ) (+). Relatively broad, or spherical (**P**); pointed or narrow (**A**).

41. **Ejaculatory apodeme** ( $\sigma$ ) (+). Small and knob-like (**P**); enlarged and modified (**A**). The shape of the ejaculatory apodeme is highly varied in *Phasia*. It is difficult to determine its evolutionary direction (Tschorsnig 1985). The small, knob-like ejaculatory apodeme is considered a ground plan character in *Phasia*, and other forms are derived.

42. **Pregonite** ( $\sigma$ ) (+). Well developed (**P**); not developed (**A**). The apomorphic state of this character has apparently arisen more than once within *Phasia*, and occurs elsewhere in the Phasiinae.

43. **Apex of pregonite** ( $\sigma$ ) (+). Narrow, or pointed (**P**); broad (**A**).

44. **Apex of postgonite** ( $\sigma$ ) (+). Narrow, or pointed (**P**); broad (**A**).

45. **Relative length of phallapodeme and hypandrial apodeme** ( $\sigma$ ) (Fig I-32.3) (+). Phallapodeme not longer than hypandrial apodeme (**P**); phallapodeme much longer than hypandrial apodeme (**A**). The apomorphic state is also seen in some species of *Ectophasia*.

46. **Anterior spine-like setae of hind tibia** ( $\varphi$ ) (+). Absent (**P**); present (**A**).

47. **Sternite VII** ( $\varphi$ ) (+). Straight, directed posteriorly (**P**); bent or directed dorsally (**A1**); bent, or directed ventrally (**A2**).

48. **Posterior margin of sternite VII** ( $\varphi$ ) (+). Broad, not pointed in ventral view (**P**); pointed or nearly so in ventral view (**A**). Sternite VII has a wide posterior margin in most species of Phasiinae. Only those species that have a piercing ovipositor may have a narrow or pointed posterior margin of sternite VII. The apomorphic state of this character is believed to have arisen several times in *Phasia*.

49. **Posterior notch of sternite VII** ( $\varphi$ ) (++). Absent (**P**); present (**A**).

50. **Ovipositor (sternite VIII)** ( $\varphi$ ) (+). Directed or bent dorsally (**P**); directed or bent ventrally (**A**). This character is related to the female's position while parasitizing the host. The apomorphic state is found in the *P. hemiptera* and *P. argentifrons* species groups.

51. **Phallapodeme** ( $\sigma$ ) (++). Not arched (**P**); strongly arched (**A**). The apomorphic state is found in several species in the *P. argentifrons* species-group.

## 2.5. Morphological terminology

Morphological terms used in the descriptions are those of McAlpine (1981) (see Figures I-31, I-32) except for male terminalia for which we follow the modifications of Wood (1991), Cumming *et al.* (1995) and Cumming and Sinclair (1996). The genital arch formed



from tergite IX is termed the **epandrium**. Sternite IX, which supports the aedeagal complex, is termed the **hypandrium**. The **surstyli** are lobes derived from the epandrium and articulated to its ventrolateral margin. The structures posterior to the ninth segment comprise the proctiger. The only components of the proctiger retained in male *Phasia* are the **cerci**. The cerci are fused in Gymnosomatini (*sensu* Tschorsnig 1985), but are separated in *Phasia* ["**syncercus**" refers to cerci as a single structure herein]. The **phallus** is a tubular structure with a pair of **postgonites** associated with its base. We follow Cumming and Sinclair (1996) and Pollet and Cumming (1998) in using the neutral term postgonite for the structures referred to as parameres by McAlpine (1981) and gonostyli in Cumming *et al.* (1995). The phallus is divided into a proximal **basiphallus** and a distal **distiphallus** and exhibits a variety of forms in the genus *Phasia*. The basiphallus bears a posterior process termed the **epiphallus**. The **ejaculatory apodeme**, the prominent feature of the sperm pump, is connected with the base of the phallus.

The female terminalia are modified for parasitism, and are discussed by Herting (1957), McAlpine (1981) and Cantrell (1988). Tergite VI is well sclerotized, and spiracle 6 is always located in the lateral margin of tergite VI. Spiracle 7 is situated either on tergite VII (not sclerotized and reduced in *Phasia*) or displaced anteriorly to tergite VI. Tergite VIII, which is usually divided middorsally into two remnants in Tachinidae, is absent in *Phasia*. Tergite IX is always absent in Tachinidae. The piercing ovipositor in *Phasia* is derived from sternite VIII (termed segment VIII by Draber-Mońko 1965). Sternites IX and X are absent. A pair of short, unmodified cerci is present behind tergite X.

#### Measurements:

**Body length:** measured dorsally, and taken as length from base of antenna to apex of abdomen.

**Vertex width:** distance between eyes at vertex.

**Parafacial width:** minimum distance between anterior margin of eye and facial ridge.

**Intervibrissal distance:** straight-line distance between two vibrissae.

**Width/length ratio of oral opening:** shortest width and maximum length of oral opening in ventral view.

**Eye height:** maximum vertical height of eye, as taken parallel to occipital region of head.

**Genal height:** linear distance between most ventral point of eye and ventral margin of gena directly below that point.

**Angle of M meeting R<sub>4+5</sub>:** if less than 80 degrees, called "at acute angle", otherwise, it is "almost at right angle".

**Wing vein length:** measured as length along the vein, not as linear distance.

**Ratio of width/length of abdominal tergite:** width measured at the base of each tergite; length is median length excluding the hidden part of tergite.

**Sternite length:** maximum linear length excluding hidden part of sternite.

**Direction of sternites VII and VIII:** direction relative to body axis.

**Abbreviations for leg setae:**

- a*: anterior seta
- ad*: anterodorsal seta
- av*: anteroventral seta
- d*: dorsal seta
- pd*: posterodorsal seta
- p*: posterior seta
- pv*: posteroventral seta
- v*: ventral seta

### 3. Taxonomy

This section deals with the classification of *Phasia* exclusive of the Neotropical species. The species previously placed in *Alophorophasia* Townsend (*sensu* Crosskey 1976) and *Effitayloria* Malloch (*sensu* Crosskey 1973) are here transferred to *Phasia*, but not keyed or revised because of lack of data; types of these genera have not been re-examined.

The species-groups and species descriptions within each species-group are presented in alphabetical order, following the key to species groups. Keys to species are provided separately for each species-group.

#### 3.1. Genus *Phasia* Latreille 1804

*Thereva* Fabricius, 1798: 548, 560. (preocc. Latreille, 1796). Type species: *Conops subcoleoptratus* Linnaeus, 1767, by designation of Herting, 1984: 168.

*Phasia* Latreille, 1804: 379. Type species: *Conops subcoleoptratus* Linnaeus, 1767, by subsequent monotypy of Latreille 1805: 379 (ICZN 1970, Opinion 896).

*Alophora* Robineau-Desvoidy, 1830: 293. Type species: *Syrphus hemipterus* Fabricius, 1794, by designation of Robineau-Desvoidy, 1863(II): 226.

*Hyalomya* Robineau-Desvoidy, 1830: 298. Type species: *Phasia semicinerea* Meigen, 1841 [= *Phasia pusilla* Meigen, 1824], by designation of Westwood, 1840: 140.

*Hyalomyia*. Incorrect subsequent spelling of *Hyalomya* Robineau-Desvoidy.

*Halophora* Agassiz, 1846: 171. Emendation of *Alophora* Robineau-Desvoidy 1830.

*Phorantha* Rondani, 1862: 6, 21. Type species: *Phorantha musciformis* Rondani, 1862 [= *Conops subcoleoptratus* Linnaeus, 1767], by monotypy.

*Mormonomyia* Brauer and Bergenstamm, 1891: 388. Type species: *Mormonomyia laniventris* Brauer and Bergenstamm, 1891 [= *Phasia argentifrons* Walker, 1849], by subsequent designation of Townsend, 1916: 8.

*Allophora* Mik, 1894: 49. Emendation of *Alophora* Robineau-Desvoidy.

*Allophorella* Townsend, 1912: 45. Type species: *Thereva obesa* Fabricius, 1798, by original designation.

- Euphorantha* Townsend, 1915: 20. Type species: *Alophora diversa* Coquillett, 1897, by original designation.
- Paraphasia* Townsend, 1915: 20. Type species: *Alophora fenestrata* Bigot, 1889, by original designation.
- Paraphorantha* Townsend, 1915: 20. Type species: *Allophora grandis* Coquillett, 1897, by original designation.
- Phasiomyia* Townsend, 1915: 20. Type species: *Alophora splendida* Coquillett, 1902 [= *Phasia aurulans* Meigen, 1824], by original designation.
- Alophoropsis* Townsend, 1915: 20. Type species: *Alophora phasioides* Coquillett, 1897 [= *Hyalomyia robertsonii* Townsend, 1891], by original designation.
- Phoranthella* Townsend, 1915: 23. *Nomen nudum* (Opinion 205, ICZN, 1954: 311).
- Austrophasia* Townsend, 1916: 45. Type species: *Hyalomyia rufiventris* Macquart, 1851, by original designation.
- Oedematopteryx* Townsend, 1916: 633. Type species: *Alophora pulverea* Coquillett, 1897 [= *Hyalomyia robertsonii* Townsend, 1891], by original designation.
- Bogosiella* Villeneuve, 1923: 78. Type species: *Bogosiella pomeroyi* Villeneuve, 1923, by monotypy. **Syn. nov.**
- Campbellia* Miller, 1923: 432. Type species: *Campbellia campbelli* Miller, 1923, by original designation. **Syn. nov.**
- Alophorellopsis* Townsend, 1927: 209. Type species: *Alophorellopsis capitata* Townsend, 1927, by original designation.
- Alophorophasia* Townsend, 1927: 287. Type species: *Alophorophasia alata* Townsend, 1927, by original designation. **Syn. nov.**
- Tayloria* Malloch, 1930: 98. Type species: *Tayloria testacea* Malloch, 1930, by original designation. **Syn. nov.**
- Akosempomyia* Villeneuve, 1932: 243. Type species: *Akosempomyia caudata* Villeneuve, 1932, by monotypy. **Syn. nov.**
- Kosempomyia* Villeneuve, 1932: 243. Type species: *Kosempomyia tibialis* Villeneuve, 1932, by monotypy. **Syn. nov.**
- Epaulophasia* Townsend, 1934: 207. Type species: *Epaulophasia officialis* Townsend, 1934, by original designation. **Syn. nov.**
- Heyneophasia* Townsend, 1934: 208. Type species: *Heyneophasia heynei* Townsend, 1934, by original designation. **Syn. nov.**
- Xanthotrichius* Townsend, 1934: 209. Type species: *Xanthotrichius xenos* Townsend, 1934, by original designation. **Syn. nov.**
- Phoranthella* Townsend, 1936: 58 (also 1938: 68). *Nomen nudum*.
- Xiphophasia* Townsend, 1937: 116. Type species: *Xiphophasia ushpayacua* Townsend, 1937, by monotypy. **Syn. nov.**
- Besserioides* Curran, 1938: 185. Type species: *Besserioides sexualis* Curran, 1938 [= *Catharosia varicolor* Curran, 1927], by original designation. **Syn. nov.**
- Trichophasia* Townsend, 1939: 447. Type species: *Trichophasia transita* Townsend, 1939, by original designation. **Syn. nov.**
- Paraphasiana* Townsend, 1940: 889. Type species: *Paraphasiana dysderci* Townsend, 1940, by original designation. **Syn. nov.**
- Effttayloria* Malloch, 1941: 64. [Replacement name for *Tayloria* Malloch, 1930]. **Syn. nov.**
- Hyalomyiopsis* Brooks, 1945: 676. Type species: *Hyalomyia aldrichii* Townsend, 1891, by original designation.
- Brumptalophora* Dupuis, 1949: 544. Type species: *Alophora aurigera* Egger, 1860, by original designation.
- Androeryops* Beneway, 1961: 44. Type species: *Hyalomyia ecitonis* Townsend, 1897, by original designation.

designation. **Syn. nov.**

*Stackelbergella* Draber-Mońko, 1965: 180 (as subgenus of *Allophora*). Type species: *Allophora rohdendorfi* Draber-Mońko, 1965, by original designation.

*Barbella* Draber-Mońko, 1965: 184 (as subgenus of *Allophora*). Type species: *Allophora barbifrons* Girschner, 1887, by original designation.

## Generic Description

**HEAD:** Head holoptic or dichoptic. Frons of male usually wider than that of female. Eyes touching each other or separated by a distance as wide as antennal length. Frontal vitta usually triangular, occasionally rectangular. Frontal setae mediocline, extending forward only to level of pedicel. Procline orbital setae and upper orbital setae absent; fronto-orbital plate bare or haired anteriorly, if haired, fronto-orbital setae variable from one row to over ten rows (reaching to eye); fronto-orbital setae usually black, but occasionally yellow or yellow and black. Ocellar seta usually present, but sometimes hair-like and not differentiated from other hairs of ocellar triangle. Inner vertical seta usually present, outer vertical seta usually absent.

Parafacial bare or haired, broad or extremely narrow. Vibrissa well differentiated from subvibrissal bristles or not; facial ridge with bristles on lower 1/6 to 1/3. Genal groove well developed or reduced; gena usually narrow, hairs black, white or a mixture of both. Lower margin of face perpendicular or extremely projecting. Face not convex. Antenna short, reaching to half height of face; or long, extending downward to vibrissal angle; first flagellomere 2.5 times as long as or subequal to pedicel; pedicel with patch of short setae on anterior surface, one of which is elongate; arista bare, thickened on basal 1/4 to 1/3; first and second aristomere short. Eyes bare; eye facets uniform in size or enlarged dorsally. Occiput usually flattened, occasionally slightly convex, with pale or black hairs, or a mixture of both. Functional mouthparts present; palpus clavate; prementum almost as long as head length; length of oral opening same as or over 3 times as long as wide.

**THORAX:** Mesonotum usually black. Postpronotum with 0-3 setae. Proepisternum bare; proepimeron haired; prosternum bare. Scutum sparsely bristled; 0(1)+0(2) acrostichal setae; 0(1)+0(2) dorsocentral setae; 0-1 intra-alar seta; presutural supra-alar seta absent or present; 1-2 postsutural supra-alar setae; 2 postalar setae; 2 notopleural setae; Anepisternal seta fine or strong; 0, 1, 2 or 3 katepisternal seta. Scutellum with 1-2 pairs of marginal setae, if only 1 pair, then apical scutellar seta absent; discal scutellar seta absent. Subscutellum well developed.

Wing transparent, especially in female, sometimes with distinct colour pattern or entirely dark in male. Vein M with a bend, ending in  $R_{4+5}$ , apical cell closed and petiolate.

**ABDOMEN:** Abdomen usually spherical, sometimes slender. In dorsal view, tergites I+II, III, IV, V, and sometimes part of VI visible, without distinct marginal and discal setae. Sternites fully exposed.

Male terminalia retracted within tergite V. Tergite VI very large, fused with segment VII+VIII, forming an acute angle. Epandrium divided into two lateral parts, only narrowly connected dorsally. Sternite V usually notched posteriorly; sternite VI ring-like, connected with tergite VII+VIII laterally. Syncercus separated by a median longitudinal suture; apex usually bent ventrally. Surstylus well developed. Subepandrial sclerite long, and well developed. Hypandrium dorsoventrally flattened, broad and symmetrical; hypandrial apodeme very long. Pregonite and postgonite fused at base. Ejaculatory apodeme variable in size and shape. Phallus varying in length and width; epiphallus developed or indistinct; distiphallus membranous or well sclerotized.

Female terminalia highly specialized. Sternite VI usually prominent posteriorly. Sternite VII (sheath) highly modified. Tergite VI present. Sternite VIII well sclerotized, modified into a piercing ovipositor. Cercus spoon-like, bristled.

### Recognition of the genus *Phasia*

*Phasia* can be distinguished from other Phasiinae by the following key

1. Abdominal tergites fused, sutures between them almost obliterated ..... 2
  - Abdominal tergites not fused, sutures between them conspicuous ..... 3
2. Antenna long, reaching or nearly reaching lower margin of face. Scutellum without apical setae ..... *Gymnosoma* Meigen (worldwide except Australia)
  - Antenna short, separated from lower margin of face by about length of first flagellomere. Scutellum with apical setae ..... *Cistogaster* Latreille, *Perigymnosoma* Villeneuve (Holarctic, Oriental & Neotropical)
3. Vein M ending in  $R_{4+5}$ , petiole longer than vein  $r-m$  ..... 4
  - Vein M ending in wing margin, or  $R_{4+5}$  but petiole not longer than vein  $r-m$  ..... 5
4. Abdominal tergites with at least one pair of marginal bristles; female without piercing ovipositor ..... *Xanthomelanodes* Townsend (in part, New World)
  - Abdominal tergites without distinct marginal bristles; female with piercing ovipositor ..... *Phasia* Latreille (worldwide)
5. Hind tibia with dorsal longitudinal row of long flattened blade-like setae, flanked by a second row of similarly shaped but much shorter setae ..... *Trichopoda* Berthold (New World and Oriental)
  - Hind tibia without such setae ..... OTHER GENERA

### Key to the world species-groups of *Phasia*

1. Dorsal facets of eye same size as ventral facets.....

- Phasia varicolor* species-group** (Oriental, Australasian, Afrotropical and Neotropical)
- Dorsal facets of eye larger than ventral facets ..... 2
  - 2. Fronto-orbital plate bare laterally (as in Figs. I-5.2, I-13.2) ..... 3
  - Fronto-orbital plate haired laterally (as in Figs. I-1.2, I-2.2) ..... 4
  - 3. Lower margin of face enormously prominent, face deeply concave in profile (as in Figs. I-13.1, I-15.5); sublunular bulla always well developed; subscutellum extending well beyond the scutellar apex (as in Fig. I-31.4); male sometimes with scale-like setae on wing base and femur .. ***Phasia argentifrons* species-group** (Southern Hemisphere)
  - Lower margin of face weakly to moderately prominent (as in Figs. I-23.1, I-33.1); sublunular bulla usually not developed; subscutellum evenly rounded, not extended beyond the scutellar apex; male without scale-like setae .....
  - ..... ***Phasia pusilla* species-group** (worldwide except Australasian and Afrotropical)
  - 4. Frons swollen (as in Figs. I-10.1, I-11.1-2); lower margin of face perpendicular, or only slightly projecting.....
  - ..... ***Phasia barbifrons* species-group** (Palearctic, Oriental, Mexico)
  - Frons not swollen; lower margin of face well projecting ..... 5
  - 5. Fronto-orbital plate densely haired, haired area sometimes reaching eye or nearly so (as in Figs. I-1.1-2., I-26.1-2.) .....
  - ..... ***Phasia hemiptera* species-group** (worldwide except Australia)
  - Fronto-orbital plate with only a few rows of hairs, usually less than 3-4; never reaching eye (as in Figs. I-3.2, I-58.2)... ***Phasia subcoleoprata* species-group** (worldwide)

### 3.2. The *Phasia argentifrons* species-group

The *Phasia argentifrons* species-group includes all species previously placed in the subgenus *Mormonomya* Brauer and Bergenstamm (Crosskey 1973, 1984, Cantrell and Crosskey 1989), the genus *Epaulophasia* Townsend (Townsend 1934, Guimarães 1971) and the genus *Campbellia* Miller (Miller 1932, Dugdale 1969, Cantrell and Crosskey 1989).

**Diagnosis:** Head compressed anteriorly or spherical; fronto-orbital plate entirely bare laterally, not swollen; dorsal facets of eyes larger than ventral ones; inner margins of eye divergent. Parafacial bare; lower margin of face strongly projecting, almost forming a right angle with face. Sublunular bulla spherical or knob-like; first flagellomere short. Length of oral opening more than 2.5 times width; occipital hairs white. Thorax black; scale-like setae sometimes present in male; scutellum black; subscutellum exceptionally prominent. M meeting R<sub>4+5</sub> at right angle. Abdomen subovate. Male surstylus longer than cercus; phallus short, haired or bare; apex of pregonite broad; postgonite well developed.

### Key to species of the *Phasia argentifrons* species-group

(The males of *Phasia jeanneli*, *Phasia furcata* and *Phasia nigromaculata* and the females of *Phasia distincta* and *Phasia brachyptera* are unknown. Unrevised [Neotropical] species are marked with an asterisk)

1. Female ..... 2
- Male ..... 10
2. Apex of sternite VII bent or directed ventrally ..... 3
- Apex of sternite VII straight or directed dorsally ..... 8
3. Sternite VII broad, strongly bent downward posteriorly ..... 4
- Sternite VII narrow, only slightly bent downward ..... 6
4. Lower margin of face orange yellow; posterior margin of sternite VII almost spherical, with a shallow median notch ..... *P. argentifrons* Walker, 1849 ♀
- Lower margin of face brown, or black; posterior margin of sternite VII not as above ..... 5
5. Sternite VII branched ..... *P. furcata* Sun, new species ♀
- Sternite VII pointed (Fig. I-32.1) ..... *P. lepidofera* (Malloch, 1929) ♀
6. Sternite VII laterally flattened in apical half, narrowest at middle in profile (Fig. I-13.6) ..... *P. campbelli* (Miller, 1923) ♀
- Sternite VII not as above ..... 7
7. Apex of sternite VII distinctly knobbed in profile (Fig. I-39.7) ..... *P. nasuta* (Loew, 1852) ♀
- Apex of sternite VII straight in profile (Fig. I-27.3) ..... *P. jeanneli* (Mesnil, 1953) ♀
8. Sternite VII arrow shaped in ventral view (as in Fig. I-42.6) ..... *\*P. officialis* (Townsend, 1934) ♀
- Sternite VII broadened near apex, with a straight posterior margin in ventral view (Fig. I-34.6) ..... *P. nigromaculata* Sun, new species ♀
- Sternite VII tapered in ventral view ..... 9
9. Sternite VII slightly flattened at base (Afrotropical) ..... *P. nigrofimbriata* (Villeneuve, 1935) ♀
- Sternite VII not flattened (Australasian and Pacific) .... *P. sensua* (Curran, 1927) ♀
- Sternite VII flattened in apical half (Neotropical) ..... *\*P. capitata* (Townsend, 1927) ♀
10. Lower margin of face orange yellow ..... 11
- Lower margin of face brown to black ..... 12
11. Distiphallus well sclerotized; phallus not haired; syncercus deeply notched posteriorly (Fig. I-6.3-4) ..... *P. argentifrons* Walker, 1849 ♂
- Distiphallus membranous; phallus sparsely haired dorsally; syncercus with a shallow notch posteriorly (Fig. I-13.4-5) ..... *P. campbelli* (Miller, 1923) ♂

12. Parafacial 2.8 times as wide as first flagellomere; both basiphallus and distiphallus well sclerotized (Fig. I-15.6); wing base and hind femur with scale-like setae.....  
 ..... *P. distincta* Sun, new species ♂
- Parafacial less than 2.0 times as wide as first flagellomere; basiphallus usually membranous; wing base and hind femur with or without scale-like setae ..... 13
13. Abdomen with yellow spot or area laterally; ejaculatory apodeme fan-like (Fig. I-12.4)  
 ..... *P. brachyptera* Sun, new species ♂
- Abdomen black; ejaculatory apodeme not fan-like ..... 14
14. Phallus haired dorsally ..... 15
- Phallus not haired ..... 16
15. Syncercus slender, with a deep U-shaped notch posteriorly; surstylus strongly arched  
 ..... *P. sensua* (Curran, 1927) ♂
- Syncercus broad and short, with a V-shaped notch posteriorly; surstylus slightly arched  
 ..... *P. lepidofera* (Malloch, 1929) ♂
16. Syncercus with a pair of teeth posteriorly, phallapodeme not strongly arched..... 17
- Syncercus usually without teeth posteriorly; if teeth present, phallapodeme strongly arched ..... 18
17. Teeth of syncercus situated in the middle of notch; distiphallus partly sclerotized ....  
 ..... \**P. capitata* (Townsend, 1927) ♂
- Teeth of syncercus situated at posterior margin of notch; distiphallus membranous (Fig. I-39.3-4) ..... *P. nasuta* (Loew, 1852) ♂
18. Phallapodeme strongly arched; notch of syncercus trapezoid, with two small teeth in middle (Fig. I-41.3-4)..... *P. nigrofimbriata* (Villeneuve, 1935) ♂
- Phallapodeme less arched; notch of syncercus funnel-shaped, without teeth .....  
 ..... \**P. officialis* (Townsend, 1934) ♂

### 3.2.1 *Phasia argentifrons* Walker, 1849

(Figures I-6, II-2.3)

*Phasia argentifrons* Walker, 1849: 691.

*Mormonomyia laniventris* Brauer and Bergenstamm, 1891: 58.

*Allophora (Phoranthia) bathymyza* Speiser, 1910: 158.

*Mormonomyia umbrosa* Villeneuve, 1935: 252.

*Mormonomyia brunnicosa* Villeneuve, 1935: 252.

*Hyalomyia munroi* Curran, 1936: 10.

*Hyalomyia victoria* Curran, 1936: 8, 11.

*Allophora argentifrons*: - Emden 1945: 433 (revision).

*Allophora (Mormonomyia) argentifrons*: - Crosskey 1980: 824 (catalog).

### DESCRIPTION

Body length: 3-6 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as



ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta brown, divergent. Frontal vitta at base of antennae 1.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer and inner vertical setae absent. Face brown, or black with grey pruinosity. Parafacial brown to black with grey pruinosity, bare, 1.5-1.8 times as wide as first flagellomere. Lower margin of face orange yellow, shining, without pruinosity. Vibrissa well differentiated; intervibrissal distance 0.9-1.0 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena brown, grey pruinose; hairs white; height 0.12 times eye height. Lunule brownish black and shining. Antennal pedicel yellow or brown; first flagellomere black, 1.5 times as long as pedicel; arista thickened on basal 0.35. Length of oral opening 3.2-3.5 times its width. Occiput flattened; greyish yellow pruinose; hairs white. Palpus yellow or brown.

**THORAX.** Mesoscutum strongly pruinose with yellow and black hairs; presutural area and anterior half of postsutural area grey pruinose; posterior half of postsutural area black, shining. 0+0(1) acrostichal seta; 0+1 dorsocentral setae; postpronotal scale-like; presutural supra-alar seta absent; 1 postsutural intra-alar seta; notopleural setae scale-like; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose, hairs black, and with scale-like setae. Anepimeral setae black; 2 katapisternal setae; 7-9 meral setae. Scutellum brown to black, shining, without pruinosity, with one pair of marginal setae; apical setae absent; discal setae arranged in one row. Subscutellum very prominent. **WING.** Lower calypter brown to black. Wing base with scale-like setae. Tegula black. Basicosta black. Wing pictured; rarely hyaline, narrow to broad; petiole of apical cell 0.2-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown to black, hairs black (scale-like). Fore tibia brown to black; without bristle; apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus brown to black. Fore claws brown, apex black, 1-1.2 times as long as fifth tarsomere. Pulvilli black. Mid femur brown to black, hairs black (or scale like). Mid tibia brown to black; with 1 *ad* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *pd*, 1 *v* and 1 *d*. Hind femur brown to black, hairs black; well developed scale-like setae present. Hind tibia brown to black, with 4-5 *pd*; dorsal setae scale-like.

**ABDOMEN.** Abdominal tergites black; pruinosity absent, or present, but thin; syntergite I+II black or dark yellow, tergites densely golden yellow or with black scale-like setae ventrally. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 0.4:1:1:0.9. **TERMINALIA.** Syncercus deeply notched posteriorly; apex bent ventrally. Surstylus slightly bent dorsally, but not broadened, longer than cercus. Ejaculatory apodeme slender, knob-like. Hypandrium shorter than phallapodeme. Pregonite reduced, apex even, with hairs and 3 teeth ventrally. Postgonite long, pointed, haired ventrally. Phallus short, almost as short as phallapodeme, not haired. Epiphallus sclerotized. Distiphallus well sclerotized, apex with a distinct finger-like lateral protuberance.

**FEMALE:** Eyes touching medially. Scutum black, shining. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) as long as sternite V; broad apically; bent, apex directed ventrally, with a median notch posteriorly. Ovipositor bent upward.

**TYPE MATERIAL**

*Phasia argentifrons* Walker, 1849. Holotype ♂, S. Africa [SOUTH AFRICA], Interior [?] (BMNH, head missing, examined).

*Mormonomyia laniventris* Brauer and Bergenstamm, 1891. Holotype ♂, [South Africa], Cape Good Hope (Vienna, not examined).

*Allophora (Phorantha) bathymyza* Speiser, 1910. Holotype ♀, TANZANIA (not located, not examined).

*Mormonomyia umbrosa* Villeneuve, 1935. Holotype ♂, [SOUTH AFRICA], Pretoria, Tvl. [Transvaal], 2.i.1922 (CNCI, examined).

*Mormonomyia brunnicosa* Villeneuve, 1935. Holotype ♂, [SOUTH AFRICA], Port-Élisabeth, Dr. Brauns (CNCI, examined).

*Hyalomyia munroi* Curran, 1936. Holotype ♂, [SOUTH AFRICA], Muizenberg, Cape Peninsula, 16.xi.1931, H.K. Munro (not located, not examined).

*Hyalomyia victoria* Curran, 1936. Holotype ♂, Southern Rhodesia [=ZIMBABWE], Victoria, viii.1932, A. Cuthbertson (AMNH, not examined).

**OTHER MATERIAL EXAMINED**

**BOTSWANA:** Tsessebe, Bechuansland, i.1956, Zumpt (1♀, BMNH). **ETHIOPIA:** Alemaya, 20-23.vi.1965, A.B. Gurney (1♂, USNM). **KENYA:** Kikuyu, Muguga, 23.v.1970 (1♂1♀, NMSA); Naivasha, vii.1940, H.J.A. Turner (1♂, USNM); Naivassha, H.J.A. Truner (3♂2♀, BMNH). **MADAGASCAR:** [no more data], xii.1947 (1♂, CNCI). **MALAWI:** Vipyra Mts., Chikangawa, 5- 8.xii.1980, 1,700m, Stuckenberg Londt (1♂, NMSA). Nyasaland [=Malawi], ix.1916, R.C. Wood (1♂, BMNH). **SOUTH AFRICA:** Cape Province, Nieuwoudtville, 18-22.xi.1931, A. Mackie (1♂, BMNH); Doorn R. Falls, A. Mackie (1♀, BMNH); Gamtoos Valley Bush, Hankey Area, 5.xii.1967, B. and P. Stuckenberg (1♂, NMSA); Natal, Greytown, 20.x.1931 (1♂, BMNH); Natal, Pinetown District, Gillitts, 29.xi.1962, B. and P. Stuckenberg (1♂, NMSA); Natal, Weenen, vii-ix.1923 and iv.1924, H.P. Thomasset (11♂9♀, AMNH, BMNH); Natal, Kloof, 7.x.1934, H.K. Munro (1♂1♀, NMSA); Pietermaritzburg, Town Bush, B. and P. Stuckenberg (1♀, NMSA); Pretoria, x.1943 and 18.vi.1906, G.A. Hepburn and C. Swierstra (6♂4♀, USNM, BMNH); Pretoria, St. John, ix.1916, H.H. Swinny (1♂, USNM); Rietfontein, Grootfontein (23mi SW), 3.iv.1972 (1♂, BMNH); Transvaal, Barberton, 9-30.vi.1927, H.K. Munro and J.S. Taylor (1♂1♀, NMSA, AMNH); Transvaal, Rustenburg, 3.xii.1961 (1♂, NMSA); Willowmore, Capland, 12.i.-19.ii.1917, xii.1907 and 5.xi.1906, Dr. Brauns (11♂3♀, NMSA); Free State, Emmarentia, 20.ix.1974, M. Picker (1♂, NMSA). **TANZANIA:** ex: W.H. Potts Collection, B.M. 1967-472 (2♂, BMNH); Arusha, 1.vii.1967, host: *Acatomia horrida*. M.E.A. Materu (2♂1♀, BMNH). **UGANDA:** Kawanda, 26.viii.1961 (1♂, NMSA). **ZIMBABWE:** Bulawayo, 7.ix.1919, 5.ix.1938 and 16.1.10, C.H. Pead (3♂1♀, AMNH, NMBZ). Matopo Hills and Umtali, v-vi.1932 (1♂1♀, BMNH); N. Vumba, 4.vii and 23.ix.1964, D. Cookson (2♂3♀, NMSA); Salisbury, 4.11.1924 (7♂2♀, AMNH, NMBZ);

Salisbury, 15.v. and 23.vi.1932, A. Cuthbertson (7♂, BMNH, CNCI); Salisbury District, 26.xi.1938 (1♂, AMNH); Trelawny Research Station (1♂, NMSA); Marley, xi-xii.1915 (2♂, NMSA, CNCI).

#### HOST

*Acatomia horrida* (Hemiptera) - Tanzania.

#### 3.2.2 *Phasia brachyptera* Sun, sp. nov.

(Figures I-12, II-1.4)

#### TYPE MATERIAL

Holotype ♂, [AUSTRALIA], Victoria, Thomson River, 7 km NNW Walhalla, 26.vi.1976 (MVNH); paratypes, 1♂, [AUSTRALIA], [Tasmania] Eaglehawk Neck, 22.iv.1957, C. Cole (MVNH); 1♂, [AUSTRALIA], [N.S.W.], Bronte, 13.xi.1953, D.K. McAlpine (AMSA).

#### DESCRIPTION

Body length: 4.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance narrower than ocellar triangle, but wider than ocellus. Fronto-orbital plate black with grey pruinosity. Frontal vitta black, triangular. Frontal vitta at base of antennae 2.8 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.8 times as wide as first flagellomere. Lower margin of face black, yellowish grey pruinose. Vibrissa well differentiated; intervibrissal distance 2.2-2.4 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.3 times as long as pedicel; arista thickened on basal 1/5. Length of oral opening 3.5-3.8 times its width. Occiput flattened, greyish yellow pruinose; hairs black. Palpus brown.

**THORAX.** Presutural area of Mesoscutum grey pruinose, postsutural area black shining, with fine black hairs. 0+1(2) acrostichal setae; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, but fine; 0-1 postsutural intra-alar seta; scale-like; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and with scale-like setae. Anepimeral setae medium size; black; 1 katepisternal seta; 8-9 meral setae. Scutellum black, shining, without pruinosity, with one pair of marginal setae; apical setae absent; discal setae arranged in one row. Subscutellum very prominent. **WING.** Lower calypter brown to black. Wing base with scale-like setae. Tegula black. Basicosta yellow. Wing pictured on basal 1/2 only, broad; petiole of apical cell less than 0.25 times as long as preceding section of R<sub>4+5</sub>; M meeting R<sub>4+5</sub> almost at right angle. Halter yellow.

**LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally

with black hairs. Fore tibia black; without bristles, apically with 1 *v*, 1 *p* and 1 *d*. Fore tarsus normal; black. Fore claws black; as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black; with 1 *ad* and 1 *v*, apically with 1 *a*, 1 *v* and 0-1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 5-6 *ad* and 2-4 *pd*.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area; pruinosity absent; longitudinal vitta absent; abdomen spherical; lateral margin of tergites with scale-like setae and grey pruinosity. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 0.3:1:1:0.8. **TERMINALIA.** Syncercus bridge-like; apex bent downward. Surstylus straight, slender, longer than cercus. Hypandrium extremely broad, longer than phallopodeme. Ejaculatory apodeme long, fan-like. Pregonite short, apex rounded. Postgonite triangular, apex pointed, longer than pregonite. Phallus shorter than hypandrium, without fine hairs dorsally. Distiphallus swollen, partly sclerotized.

**FEMALE.** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

The specific name refers to the relatively short wings of this species.

#### 3.2.3 *Phasia campbelli* (Miller, 1923), comb. nov.

(Figures I-13, II-1.2)

*Campbellia campbelli* Miller, 1923: 433 - Townsend 1938: 43 - Dugdale 1969: 618, 620, 635 (diagnosis and illustrations) - Cantrell and Crosskey 1989: 735 (catalog).

*Campbellia cockaynei* Miller, 1923: 436, **syn. nov.**

*Hyalomyia lancifera* Malloch, 1930: 309, **syn. nov.**

*Campbellia lancifera*: Cantrell and Crosskey 1989: 735 (catalog).

*Campbellia cockaynei*: Cantrell and Crosskey 1989: 735 (catalog).

#### DESCRIPTION

Body length: 3-8 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance narrower than ocellar triangle, but wider than ocellus. Fronto-orbital plate black with grey pruinosity. Frontal vitta black, triangular. Frontal vitta at base of antennae 1.6-1.7 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, and as wide as first flagellomere. Lower margin of face orange yellow, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.5-1.6 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena black

with grey pruinosity; hairs white; height 0.1-0.12 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.66. Length of oral opening 3-3.5 times its width. Occiput flattened, greyish yellow pruinose; hairs white. Palpus yellow or brown.

**THORAX.** Mesoscutum with a long and broad central longitudinal pruinose vitta, and two lateral shining black vittae; postsutural area yellow pruinose, presutural area grey pruinose, with fine black hairs. 0+0(1) acrostichal seta; 0+1(2) dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta absent, or present, but fine; 0 postsutural intra-alar seta; 1-2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, and with scale-like setae. Anepimeral setae medium size, black; 2 katapisternal setae; 8 meral setae. Scutellum black, shining, without pruinosity, with one pair of marginal setae; apical setae absent; discal setae arranged in one row. Subscutellum very prominent. **WING.** Lower calypter brown to black. Wing base with scale-like setae. Tegula black. Basicosta black. Wing broad, pictured on basal 1/2 only; petiole of apical cell 0.25-0.3 times as long as preceding section of  $R_{4+5}$ ;  $M$  meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown to black, with white or yellow hairs. Fore tibia black; without bristles, apically with 1 *pv*, 1 *p*, and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black with yellow base; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black; with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p* and 1 *d*. Hind femur brown to black with yellow base; ventrally and laterally with whitish yellow hairs, dorsally with black hairs; scale-like setae present. Hind tibia black, with 4-5 *ad*, 3-4 *pd* and 1 *a*; first and second hind tarus with dense fine yellow hairs.

**ABDOMEN.** Abdominal tergites black, longitudinal vitta absent; tergites with large purple area, extending to tergite V. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1.1.3; relative width I+II:III:IV:V = 0.3:1:1.1:1. Syntergite I+II shiny, not pruinose. Tergite III shiny. Pruinosity of tergite IV silvery. Tergite V with V-shaped pruinose posterolateral area, extending to tergite IV; hair spots distinct. **TERMINALIA.** Syncercus with a shallow notch posteriorly; apex bent downward. Surstylus slender, straight, longer than cercus. Ejaculatory apodeme long, stick-like. Hypandrium broad, shorter than phallopodeme, but longer than phallus. Pregonite reduced, even apically, haired ventrally. Postgonite long, pointed, with fine hairs ventrally. Phallus broad, with fine hairs dorsally on basal 1/2. Distiphallus membranous, with three small sclerotized teeth.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes separated by a distance less than width of single ocellus; almost touching. Indistinct pruinosity. Anterior spine-like setae of hind tibia present. Abdominal tergites black, shining. Sternite VII (sheath) slightly longer than sternite VI; posterolaterally flattened, knife-like; broad apically; slightly bent, apex directed ventrally; sternite VII with linear wrinkles ventrally. Ovipositor bent slightly downward.

**TYPE MATERIAL**

*Campbellia campbelli* Miller, 1923. Holotype ♂, [NEW ZEALAND], Blackball, J.M. Campbell (type depository unknown or lost, not examined).

*Campbellia cockaynei* Miller, 1923. Holotype ♂, [NEW ZEALAND], Wellington, 1.iii.1910, L. Cockayne (BMNH, examined).

*Hyalomyia lancifera* Malloch, 1930. Holotype ♂, [NEW ZEALAND], Kennedy's Bush, 29.i.1925, A. Tonnoir (not examined); allotype ♀, [NEW ZEALAND], Kennedy's Bush, 29.i.1925, A. Tonnoir (USNM, examined).

**OTHER MATERIAL EXAMINED**

**NEW ZEALAND:** DNICO Dunback, 8-18.ii.1978, B. Barratt (1♀, NZAC); Taieri, D. Miller (1♀, NZAC); MC, Ashburton, Valetta Bridge, 4.iii.1991, host: *Nysius* sp., M. Stufkens (1♀, NZAC). South Island, Tasman Valley, W Lake Pukaki, 2,000ft, 2.ii.1972, W.J. Knight and P.S. Broomfield (1♀, BMNH); Rocklands, 850m, 3.iv.1979, J.S. Dugdale (1♀, NZAC); Paiaka, 12.ii.1950, and 15.xii.1950, R.A. Cumber. (7♂, NZAC, CNCI).

**HOST**

*Nysius* sp. (Hemiptera, Lygaeidae) - New Zealand (reared by M. Stufkens).

**3.2.4 *Phasia distincta* Sun, sp. nov**

(Figures I-15.5-9, II-1.1)

**TYPE MATERIAL**

Holotype ♂, [SOUTH AFRICA], Transvaal, Dr. Brauns (NMSA).

**DESCRIPTION**

Body length: 5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance 0.5 times as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta black, divergent. Frontal vitta at base of antennae as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare; 2.8 times as wide as first flagellomere. Lower margin of face strongly projecting, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 0.9 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 3.4 times its width. Occiput flattened, white pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum black, with fine black hairs; presutural area and anterior half of postsutural area grey pruinose; posterior half of postsutural area black, shining. 0+(1)

acrostichal setae; 0+1 dorsocentral seta; postpronotal setae scale-like; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; notopleural setae scale-like; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, with scale-like setae. Anepimeral setae scale-like; 2 katepisternal setae; 7-9 meral setae. Scutellum black, thinly grey pruinose, with one pair of marginal setae; apical setae absent; discal setae arranged in rows. Subscutellum very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base with scale-like setae. Tegula black. Basicosta black. Wing pictured, broad; petiole of apical cell 0.32 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black; without bristles, apically with 1 *d*. Fore tarus black. Fore claws black; 1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black; with 1 *v*, apically with 1 *av*, 1 *pv* and 1 *d*. Hind femur black; hairs black; scale-like setae present. Hind tibia black; dorsal setae scale-like.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Syntergite I+II thinly pruinose on basal 1/2. Tergite IV not pruinose; hair spots indistinct. Tergite V grey pruinose. **TERMINALIA.** Syncercus with broadly V-shaped notch posteriorly; apex bent ventrally. Surstylus broad, slightly arched, longer than cercus. Ejaculatory apodeme slender, pointed. Hyandrium broad, longer than phallapodeme. Pregonite reduced, haired ventrally. Postgonite well developed, long, pointed, haired ventrally. Phallus short, slightly longer than hyandrium, not haired. Basiphallus well sclerotized; distiphallus strongly sclerotized, with two pairs of hooks in posterior view.

**FEMALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

*Phasia distincta* is named for the distinctive strongly sclerotized distiphallus.

#### 3.2.5 *Phasia furcata* Sun, sp. nov.

(Figures I-21, II-1.4)

#### TYPE MATERIAL

Holotype ♀, AUSTRALIA, Tasmania. Geeveston, 8.x.1922, A. Tonnoir (ANIC). paratype 1♀, [AUSTRALIA], NSW, National Park, Mt. Gibraltar, 24.ii.1965, D.K. McAlpine (AMSA).

**DESCRIPTION**

Body length: 4 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black; grey pruinose. Frontal vitta brown, triangular. Frontal vitta at base of antennae 4.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black; grey pruinose. Parafacial black with grey pruinosity; bare, 0.6 times as wide as first flagellomere. Lower margin of face black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 4 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.3 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 2.8 times its width. Occiput flattened; greyish yellow pruinose; hairs black. Palpus brown.

**THORAX.** Mesoscutum thinly greyish brown pruinose, with fine black hairs; black longitudinal vitta absent. 0+2 acrostichal setae; 0(1)+2 dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose, without scale-like setae. Anepimeral setae hair-like, black; 2 katepisternal setae; 5-6 meral setae. Scutellum black; brownish yellow pruinose, with one pair of marginal setae; apical setae absent; discal setae arranged in one row. Subscutellum very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.4 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *v*, 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; hairs black. Mid tibia brown, with 1 *ad* and 1 *v*, apically with 1 *av*, 1 *pv* and 1 *d*. Hind femur brown to black; hairs black; scale-like setae absent. Hind tibia brown, with 4-5 *ad* and 5-6 *pd*. Anterior spine-like setae of hind tibia absent.

**ABDOMEN.** Abdominal tergites black. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1; relative width I+II:III:IV:V = 0.6:1:1:0.7. Hair spots indistinct. Sternite VII (sheath) longer than sternite VI; notched posteriorly; slightly bent, apex directed ventrally; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

**HOST**

Unknown.

**ETYMOLOGY**

This specific name refers to the branched sternite VII (sheath).



**NOTES**

The holotype was labelled as "*Hyalomyia tonnoiri* sp.n." by Paramonov, but this name was never published.

**3.2.6 *Phasia jeanneli* (Mesnil, 1953), comb. nov.**

(Figures I-27.1-4, II-1.1)

*Paralophora jeanneli* Mesnil, 1953: 177.

*Hyalomyia jeanneli*: - Draber-Moňko 1964: 125 (redescription).

*Alophora (Mormonomyia) jeanneli*: - Crosskey 1980: 824 (catalog).

**DESCRIPTION**

Body length: 3.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black with grey pruinosity. Frontal vitta extremely broad, black, divergent. Frontal vitta at base of antennae 3.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.4 times as wide as first flagellomere. Lower margin of face black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 3 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height less than 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.6 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 3 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta absent; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron greyish yellow pruinose; hairs black; scale-like setae absent. Anepimeral setae strongly, black; 3 katapisternal setae; 5 meral setae. Scutellum black; shining, without pruinosity, with one pair of marginal setae; apical setae absent; discal setae randomly arranged, not in rows. Subscutellum very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of R<sub>4+5</sub>; M meeting R<sub>4+5</sub> almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown; 0.8 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with one row of *ad* and *pd*. Anterior spine-like setae of hind tibia well developed.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent; tergites I+II, III, IV black, shining, tergite V grey pruinose. Relative length of abdominal tergites I+II:III:IV:V

= 1.6:1:1:1.1; relative width I+II:III:IV:V = 0.6:1:1:0.8. Hair spots indistinct. **TERMINALIA**. Sternite VII (sheath) longer than sternite VI, bluntly terminated, broad apically, not bent; apex straight; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### TYPE MATERIAL

Holotype ♀, KENYA, Elgon Saw Mill, Mont Elgon Ver. Est (Camp II), 2,470m, Décembre, Mission de l'Omo C. Arambourg, P.A. Chappuis et R. Jeannel, 1923-33 (MNHN, examined).

#### OTHER MATERIAL EXAMINED

**SOUTH AFRICA:** Cape Province, 8km S Alexandria, 3.xi.1978, R. Miller and J. Londt (1♀, NMSA).

#### HOST

Unknown.

#### 3.2.7 *Phasia lepidofera* (Malloch, 1929), comb. nov.

(Figures I-31, I-32, II-1.3)

*Hyalomyia lepidofera* Malloch, 1929: 111; 1930: 97.

*Hyalomyia nigrihirta* Malloch, 1929: 112, **syn. nov.**

*Hyalomyia basalis* Malloch, 1930: 96, **syn. nov.**

*Hyalomyia hyalis* Malloch, 1930: 96, **syn. nov.**

*Alophora (Mormonomyia) basalis*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora (Mormonomyia) hyalis*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora (Mormonomyia) lepidofera*: Crosskey 1973: 110 (catalog) - Cantrell 1988: 89 (description of male and female terminalia) - Cantrell and Crosskey 1989: 735 (catalog).

#### DESCRIPTION

Body length: 2.5-4.5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity. Frontal vitta black or brown, triangular. Frontal vitta at base of antennae 1.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1-1.1 times as wide as first flagellomere. Lower margin of face brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height less than 0.1 times eye height. Lunule black and shining.

Antenna black; first flagellomere 1.4 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 3.5-3.8 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown to black.

**THORAX.** Mesoscutum black thinly pruinose; postsutural area sometimes with strong yellow or grey pruinosity, without black longitudinal vitta, with fine black hairs. 0+1(2) acrostichal setae; 0(1)+1(2) dorsocentral setae; 2-3 postpronotal setae (and with scale-like setae); presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae (scale-like setae absent or present); 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like setae present. Anepimeral setae medium size or strongly; black; 2 katapisternal setae; 6-8 meral setae. Scutellum black; shining, without pruinosity, with one pair of marginal setae; apical setae absent; discal setae arranged in one row. Subscutellum very prominent. **WING.** Lower calypter hyaline white. Wing base without or with scale-like setae. Tegula black. Basicosta brown to black. Wing hyaline or pictured on basal area only, narrow or broad; petiole of apical cell 0.4 times as long as preceding section of  $R_{4+5}$ ;  $M$  meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, with 1  $p$ , apically with 1  $p$  and 1  $d$ . Fore tarus yellow or brown. Fore claws brown; apex black; almost as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black, 0-1  $ad$ , 1  $p$  and 1  $v$ , apically with 1  $ad$ , 1  $p$ , 1  $v$ , and 1  $d$ . Hind femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs; scale-like setae absent. Hind tibia brown, or black, with 4-5  $ad$  and 2-3  $pd$ .

**ABDOMEN.** Abdominal tergites black, pruinosity silvery or yellow; longitudinal vitta absent; tergites with a central purple area, sometimes extending to tergite V; outside of tergites I+II, III, IV and whole tergite V yellow or grey pruinose. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.3; relative width I+II:III:IV:V = 0.6:1:1:0.8. **TERMINALIA.** Syncercus V-notched posteriorly, apex bent downward. Surstylus flattened, slightly arched dorsally; longer than cercus. Ejaculatory apodeme small. Hypandrium broad, almost as long as phallapodeme. Phallapodeme arched. Pregonite reduced, even, sparsely haired ventrally. Postgonite long, pointed, arched ventrally. Phallus longer than hypandrium, haired dorsally. Epiphallus distinct; distiphallus partly sclerotized.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia present. Syntergite I+II and central tergites III, IV shining; tergite V and outside of tergites III, IV grey pruinose. Sternite VII (sheath) longer than sternite VI, broad apically; bent; apex directed ventrally; sternite VII smooth ventrally. Sternite VII with a central membranous area. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia lepidofera* Malloch, 1929. Holotype ♂, [AUSTRALIA], New South Wales, Como, xii.1923, H. Petersen (USNM, examined).

*Hyalomyia nigrihirta* Malloch, 1930. Holotype ♂, [AUSTRALIA], Victoria, Seaford, W.F. Hill (USNM, no.41634); paratypes, 6♂5♀, same as holotype (USNM, ANIC, examined).

*Hyalomyia basalis* Malloch, 1930. Holotype ♂, [AUSTRALIA], Sydney, Wahroonga, 16.xi.1926, Ferguson (ANIC, head missing, examined).

*Hyalomyia hyalis* Malloch, 1930. Holotype ♂, AUSTRALIA, NSW, Como, xii.1923, H. Petersen (USNM, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRALIA: Australian Capital Territory:** Mt. Gingera, 5,500ft, 6.i.1963, N.B. Tindale (1♂, SAMA); Yass, 1.iv.1931 and 24-27.iii.1950, K. English (2♂1♀, ANIC, AMSA); Black Mountains, 24.x.1930, A.L. Tonnoir (2♂1♀, ANIC); Canberra, xii.1930, 23.xi.1938, 18.x.1947, M.J. Mackerras, T.C. Campbell and S.J. Paramonov (5♂4♀, ANIC). **New South Wales:** Belmont (Cannizarro), 24.ii.1963, J.H. Barrett (1♂, QDPC); Blue Mountains, Katoomba, 15.i.1922, 22.x.1964 and 28.ix.1980, N.W. Rodd and D.K. McAlpine (2♂1♀, AMSA, USNM); Boonoo Boonoo River, 29.xi.1981, G. Daniels and M.A. Schneider (3♂, UQIC); Breeza, 16.i.1979, host: *Nysius viniter* (5♂4♀, NSW); Como, xii.1923, H. Petersen (3♀, USNM); Cootamundra, 25.i.1972, host: *Nysius viniter* Bergr. (1♂, NSW); Blue Mountains, National Park, Evans Lookout, 4.xii.1971, G. Daniels (1♂, AMSA); Five Islands [?], 11.xii.1938, D.F. Waterhouse (1♂, ANIC); Glaels Tune, Mangroves, 19.xii.1961, D.K. McAlpine (1♂, AMSA); Graman, 29.iii.1960, T.V. Bourke (1♂, NSW); Jerilderie, 8.xii.1979, (1♀, NSW); Kangaroo by Vally, near Cowra, 6.x.1980, D.K. McAlpine (7♂2♀, AMSA); Leeton, 1-22.xi.1971, host: *Nysius viniter* Bergr., (11♂8♀, NSW, BMNH); Manly, 19.xi.1923 (1♀, USNM); Mittagong, Lea (1♂1♀, SAMA); Narara near Gosford, 12.xi.1980, B.J. Loudon (1♂, NSW); Narooma 25.xi.1930, A.L. Tonnoir, (1♀, ANIC); Narrabri, 21.xii.1959, W.E. Wright (1♂1♀, NSW); Narrandera, 6.xi.1966, M. Nikitin (2♀, BMNH); New England National Park, 5.xi.1981, N.W. Rodd (2♀, AMSA); Newport, 14.x.1972, E.A. Fonseca (1♀, BMNH); Nowra, F.A. Rodway (1♀, BMNH); Tibooburra, Cobham Lake, 17.xi.1949, S.J.K. Paramonov (1♂, ANIC); Rockley, near Oberon, 15.xii.1980, J. McGechan (1♂, NSW); Sydney, Bronte, 28.x.1971, D.K. McAlpine (4♀, AMSA); Sydney, Wahroonga, 17.x.1926 (4♂, ANIC); Sydney, Willoughby, 8.xi.1983, D.K. McAlpine (1♀, AMSA); Sydney, (2♂6♀, USNM, BPBM, ANIC); Sydney, 3.xii. Helms Collection (2♂, BPBM); Sydney, Wahroonga, 16-17.x.1926 (4♂, USNM); Tamworth, 8.xi.1971, host: *Nysius viniter* and *Nysius clevelandensis*, L. Greenup, (4♀, NSW, BMNH); Vacluse, near Sydney, 9.xi.1971, D.K. McAlpine (2♀, AMSAC); Salisbury, Barrington House, 26-28.xii.1965, T. Weir (1♀, UQIC). Wanaaring (40mi W), 30.x.1949, S.J. Paramonov (1♂, ANIC); Wentworth (50mi SW), Murray River, 22.xi.1967, A. Neboiss (1♂, MVNH); Wilcannia (20 km S), 10.iv.1970, B.J. Loudon (1♂, NSW); Willowtree, 20.vi.1921 (1♀, NSW). **Queensland:** Bald Mountain area, 20-21.xi.1980, M.A. Schneider and G. Daniels (1♀, UQIC); Brisbane,

28.xi.1963 and 4.x.1983, host: *Oxycarenum luctuosus*, R. Kumar and B.K. Cantrell (3♀, UQIC); Cunningham Cap., 3.xi.1958, F.A. Perkins (3♀, UQIC); Emerald Cent., QDPC Station, 1.xi.1975, I.D. Galloway (2♂, QDPC); Epping (1♀, AMSA); Gatton, 6.xi.1933 and 19-26.x and 11-18.xi.1981 (1♂3♀, UQIC, QDPC); Gatton, 30.ix.1983, P. Allsopp, host: *Nysius viniter* (4♂1♀, NSWA, QDPC); Kogan, 21.x.1958, S. Sekhon (1♂2♀, UQIC); Marduroo (57 km N), 19.ix.1977, J.A. Forrest (7♂2♀, SAMA); Mt. Isa, 9.ix.1967, host: *Nysius viniter*, H. Burton (1♂1♀, ANIC); Narion Downs Stn., Georgina Crossing, 19.ix.1977, J.A. Forrest (1♂, SAMA); Norwin (SE), 4.x.1982, E.R. Sinclair (1♂4♀, QDPC); Rex Range Lookout via Julatten, 9.xi-2.xii.1981 (1♂, QDPC); St. Ruth, 20.x.1958, S. Sekhon (1♂, UQIC); Sunnybank, 18.ix.1927 (2♀, UQIC). **South Australia:** Adelaide, 4-19.xii.1953 and v.1962, C. Watts, N.B. Tindale and G.F. Gross (25♂25♀, CNCI, SAMA); Aldinga Sellicks Beach Res., 25.ii-13.iv.1987, E.G. Matthews and J.A. Forrest (1♂1♀, SAMA); Belair, 6.xi.1961 and 31.x.1963, R.V. Southcott and G.F. Gross (3♂5♀, SAMA); Binberrie Hill, Boolcoonda Stn., 24.ix.1962, P. Aitken (1♀, SAMA); Black Rock, x.1930, J. Evans (2♂, ANIC); Blanchetown, Roonka Stn., 26.v.1973, G. Pretty (1♂, SAMA); Bromplan, 4.xii.1952, G.F. Gross (7♂3♀, SAMA); Coonalpyn (20km SW), Mt Bootby CP, 20.xi.1991, J.A. Forrest (7♂1♀, SAMA); Edillilie (10 mi N), 7.xii.1968, N. McFarland (1♂1♂, SAMA); Eyre Peninsula, (6mi E), 8.x.1964, G.F. Gross (1♂, SAMA); Eyre Peninsula, 16 km E Cummins, 6.xii.1986, J.A. Forrest (1♀, SAMA); Eyre Peninsula, 7km S Mt. Hope, 29.ix-1.10.1979, P. Greenslade (4♂13♀, SAMA); Eyre Peninsula. Carapee Hill, 29.ix.1979, P. Greenslade (2♀, SAMA); Eyre Peninsula, Kap-pawanta Station, 3.xii.1986, J.A. Forrest (2♀, SAMA); Eyre Peninsula, Calpatanna W.H. Cons. Pk., Wedina Well, 1.xii.1986, J.A. Forrest (2♂, SAMA); Gawler Rge (10 km E), 19.x. 1982, P.C. Reenslade (2♀, SAMA); Great Vict., 10km NW Emu June, 6.x.1976, J.A. Herridge (1♂, SAMA); Great Vict. Desert. Vehicle net 170-200km N Cook, through sand-dunes, 21.viii. 1980, J. Forrest (1♂, SAMA); Greenly Island, 7-16.xii.1947, F.J. Mitchell (1♀, SAMA); Hauwker, 14.xii.1952, G.F. Gross (3♂1♀, SAMA); Innamincka (16mi S), 28.v.1967, R. Lossin (1♀, AMSA); Kyancutta (16mi E), 10.ix.1964, G.L. Bush (1♀, AMSA); Lucindale, A.M. Lea (1♀, SAMA); Mannum, Malineux (1♀1♂, SAMA); Mt. Gambier, 4.i.1966, T. Weir (1♀, QUIC); Mt. Lofty, xii.1966, R.V. Southcott (1♂1♀, SAMA); Mt. Lofty Rgs., A.H. Elston (1♂, ANIC); Myponga, A.H. Elston (2♂, ANIC); Oakden Hills Station (12 km S), Blyth Dam, 30.x.1975, J.A. Herridge (1♂1♀, SAMA); Rev., A.P. Burgess (1♂, SAMA); Scorpion Spgs C.P. Along main NS track, 15.xii.1983 (7♂5♀, SAMA); Tarcoola, A.M. Lea (1♀, SAMA); Upper Western R., Kangaroo I., 29.xi.1977, D.K. McAlpine and M.A. Schneider (2♂1♀, AMSA); Upper Ravine des Casoars Kangaroo I., 3.xii.1977, M.A. Schneider (3♀, AMSA); Wallaroo (20 km NE), 18.xi.1977, J.F. Donaldson (7♂6♀, QDPC); Wanna, 18 mi S Pt. Lincoln, 8.xii.1968, N. McFarland (1♀, SAMA); Willunga (2 km S), 26.xi.1977, M.A. Schneider (2♀, AMSA). **Tasmania:** Scottsdale, T.G.F. Hill (1♂1♀, SAMA). **Victoria:** Bacchus Marsh, 21.i.1906 (9♂, MVNH); Beaconsfield, 29.1.1973, E.A. Fouseca (1♀, BMNH); Dandenong Ranges,

1.11.1898 (14♂11♀, MVNH); Kerang, 31.viii.1946, (1♀, MVNH); Lorne, 19.x.1918, F.E. Wilson (1♀, SAMA); Melton, 24.i.1957 (1♂, MVNH); Monluck, 3.2.1899 (1♂, BMNH); Nelson (4mi NE), Glenelg Riv., 25.xi.1966, Nebolss (1♀, MVNH); Phillip Island, 13.xii.1968, I.C. Yeo (2♂2♀, UQIC); Portland (40 km NE), 26.xi.1977, J.F. Donaldson (5♂, QDPC); Princetown (W), Ocean Rd., 27.xi.1977, J.F. Donaldson (7♂10♀, QDPC); Portland, Mt. Richmond National Park, 5.i.1966, T. Weir (2♂3♀, UQIC); Ringwood, 16.xi.1918, C.E. Cole (1♂, MVNH); Warburton, F.E. Wilson, 13.i.1924, (3♂, ANIC). **Western Australia:** Albany (16 km W), 8.i.1986, G and A. Daniels (3♂2♀, UQIC); Arthur, 6.1.61 (1♂, AMSA); Bluff Knoll, Stirling Ranges, 8.xii.1970, G.A. Holloway and H. Hughes (1♂, AMSA); Bunbury, i.1957, A. Snell (4♂, AMSA); Dongara, 26.ix-3.x.1935, R.E. Turner (1♀, BMNH); Fremantle, xii.1968, N.L.H. Krauss (1♀, BPBM); Margaret River, 28.xii.1970, G.A. Holloway (1♀, AMSA); Merredin, 13.xii.1935, R.E. Turner (1♀, BMNH); Moora (3-12 mi N), 5.1.1966 (1♀, BMNH); Mt. Magog, Sterling Ranges, 7-8.xii.1970, G.A. Holloway and H. Hughes (12♂16♀, AMSA); Pemberton (5 mi W), Treen Brook, G.A. Holloway and H. Hughes (2♀1♂, AMSA); Pemberton (6 mi SE), Warren River, 17.i.1971, G.A. Holloway and H. Hughes (1♂, AMSA); Porongurups, 9-10.xii.1970, G.A. Holloway (1♂, AMSA); Serpentine Falls, Darling Ranges, 20.i.1971, G.A. Holloway (1♂3♀, AMSA); Walpole (9 mi SW), Long Point, 13.xii.1970, G.A. Holloway (1♀, AMSA); Walpole-Nornalup National Park, Circular pool, 8.i.1986, G. A Daniels (1♀, UQIC); Wave Rock (7 km N), 8-11.i.1986, G. and A. Daniels (2♂, UQIC); Yanchep National Park, 22-26.x.1985, A. Dyce and W. Wirth (2♂4♀, USNM). **Doubtful localities:** [?], 14Y, 24.iii.1930 and 16.iv.1931, K.E. Yoss (2♂1♀, AMSA); Lylennye, 19.iv.1952 (3♀, SAMA); Maynard's bore (4 mi SW), Everard Pk. Stn., 6.xi.1970, G.F. Gross (1♀, SAMA); Tarbul Pt., 11.8.1952 (1♂, UQIC); Therribri, xi.1932, M. Ackerras (1♀, ANIC).

## HOSTS

*Nysius vinitor* Bergroth (Hemiptera, Lygaeidae): - Australia (Crosskey 1973: 179).

*Nysius clevelandensis* Evans (Hemiptera, Lygaeidae): - Australia (New South Wales).

*Oxycarenus luctuosus* (Montrouzier). (Hemiptera, Lygaeidae): - Australia (Queensland).

### 3.2.8 *Phasia nasuta* (Loew, 1852), comb. nov.

(Figures I-39, II-2.2)

*Hyalomyia nasuta* Loew, 1852: 660.

*Alophora nasuta* (Loew, 1852); - Emden 1945: 432 (revision).

*Alophora (Mormonomyia) nasuta*: - Crosskey 1980: 824 (catalog).

*Alophora capensis* Schiner, 1869a: 337.

*Alophora (Paralophora) aethiopica* Bezzi, 1908: 88.

*Mormonomyia leucodes* Villeneuve, 1935: 252.

**DESCRIPTION**

Body length: 3-3.5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes almost touching. Fronto-orbital plate black with grey pruinosity. Frontal vitta brown to black, divergent, and at base of antennae 1.3 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare; 0.9 times as wide as first flagellomere. Lower margin of face strongly projecting, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena brown and black with grey pruinosity; hairs white; height 0.12 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.3 times as long as pedicel; arista thickened on basal 0.35. Length of oral opening 3.5 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow or brown.

**THORAX.** Mesoscutum thinly and evenly pruinose, with fine black hairs. 0+1 acrostichal setae; 0+1 dorsocentral setae; 2-3 postpronotal setae; presutural supra-alar seta absent; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like setae absent. Anepimeral setae scale-like, black. Usually 2 katapisternal setae. 3-5 meral setae. Scutellum black, thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws brown; black apically, as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 3-4 *ad* and 2-3 *pd*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent; tergites I+II, III and almost all of tergites IV form a big purple, shining spot; tergite V and outer side of tergites III, IV grey pruinose. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots indistinct. **TERMINALIA.** Syncercus with a deep notch and a pair of teeth posteriorly; apex bent ventrally. Surstylus slender, longer than cercus, not bent. Ejaculatory apodeme long; Hypandrium broad, almost as long as phallapodeme. Phallapodeme arched. Pregonite reduced, even, haired ventrally. Postgonite long, pointed, sparsely haired ventrally, bent ventrally. Phallus short, not haired, almost as long as hypandrium; basiphallus well-sclerotized; Distiphallus membranous.

**FEMALE:** Eyes touching. Anterior spine-like setae of hind tibia present. Syntergite I+II and most part of tergite III form a big black spot. Sternite VII (sheath) longer than sternite VI; apex with a knob; broadened apically; bent, apex directed ventrally (slightly); sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**TYPE MATERIAL**

*Hyalomyia nasuta* Loew, 1852. Holotype sex?, Mozambique? (not located, not examined).

*Alophora capensis* Schiner, 1869a. Holotype sex?, [SOUTH AFRICA], Cape (not located, not examined).

*Allophora (Parallophora) aethiopica* Bezzi, 1908. Holotype sex?, ETHIOPIA (not located, not examined),

*Mormonomyia leucodes* Villeneuve, 1935. Holotype ♂, [no more data available except the determination label, but the type locality is South Africa (Villeneuve 1935)] (CNCI, examined)

**OTHER MATERIAL EXAMINED**

**BURUNDI:** Terr., Kitega, Francois (1♂, CNCI). **KENYA:** Naivasha, 4-40. H.J.A. Turner (1♂, BMNH); **LESOTHO:** Maseru District, Roma Mission, 4-13.i.1963, B. P. Stuckenberg (8♂12♀, NMSA). **SOUTH AFRICA:** Barberton, 9.11.1917, H.K. Munro (1♂, AMNH); Cape, Calvinia district, Brandkop area, 14.x.1964, B. and P. Stuckenberg (1♀, NMSA); Cape, Bredasdorp National Res., 24.ix.1979, J. Londt (2♂, NMSA); Cape Province, Tulbagh (3km S), 30.viii.1981, J. Londt etc. (1♂, NMSA); Cape Province, East London, Umdanzani, v.1924, H.K. Munro (1♀, AMNH); Cape Province, Port Elizabeth District, Van Staadens Pass, 30.x.1964, B. P. Stuckenberg (1♂, NMSA); Cape of Good Hope Nature Reserve, 7-10.iii.1968, P.J. Spangler (1♂, USNM); Cape Province, Huguenot, ii.1932 (1♀, BMNH); Cape, Wellington District, Nainskloof, 4-5.x.1959, B.P. Stuckenberg (1♂, NMSA); Cape Province, Nieuwoudtville, 18-22.xi.1931 (1♀, BMNH); Cape Province, Oudtshoorn, x.1931, J. Ogilvie (1♂, BMNH); Cape Flats, 13.xi.1930, H.W. Simmonds (1♂, BMNH); Cape Colony, Fales Bay, 28.i.1912, H.H. Barnard (1♂, BMNH); Cape province, Calvinia, xi.1931, J. Ogilvie (1♂, BMNH); Cape Province, Van Rhyns Pass, xi.1931 (1♀, BMNH); Cape Province, Mts. above Graaff Reinet, x.1931 (1♀, BMNH); Cape province, Doorn R. Falls, xi.1931, A. Mackie (1♀, BMNH); Cape Province, Alexandria (8km S), 3.xi.1978, R. Miller and J. Londt (1♂1♀, NMSA); Cape, Swellendam (5km SW), 24.ix.1979, J. Londt (1♂, NMSA); Cape Province, Steytlerville (7km N), Groot River, 30.x.1978, R.M. Miller (2♀, NMSA); Cape Province, Fraserburg (16km E), 1,000m, 23.ix.1977, R.M. Miller (1♀, NMSA); Cape Province, Hoqsback (10km N), 14.xii.1985, J. and B. Londt (1♀, NMSA); Cape Province, Lambert's Bay (5mi W), 15.ix.1972, M.E. and J. Irwin (13♂8♀, NMSA); Cape (W), Strandfontein, Groot-Sandleegte, 10-12.x.1977, R.M. Miller (5♂6♀, NMSA); Cape (SW), Calvinia District, Brandkop Area, 14.x.1964, B. and P. Stuckenberg (1♂, NMSA); Cape (W), Cape Town, above Cable House, 24.ix.1959, B. and P. Stuckenberg (1♂, NMSA); Cape Province, Kamieskroon Commonage, 900m, 31.viii.1989, J. Londt and P. Croeser (1♀, NMSA); Cape, Wellington (5km E), 27.ix.1979, J. Londt (1♀, NMSA); Giants Castle Res., Natal Drakensberg, 18-23.ix.1963, B. and P. Stuckenberg (1♂, NMSA); Jeffreys Bay, Coastal



Dune, Humansdorp Area, 3.12.1967, B and P. Stuckenberg (2♂6♀, NMSA); Johannesburg, B.M. 1911-333 (1♀, BMNH); Johannesburg, 25.i.1959, O.G. Babcock (1♀, USNM); Mt. Emlembe, near Havelock Mine, 7.xi.1970, 1,425m, P. Stuckenberg (2♀, NMSA); Natal, Weenen, vi-vii.1923 and iv.1924, H. P. Thomasset (3♂2♀, BMNH); Natal, Drakensberg, 18-23.ix.1963 and 1.xi.1972, B. and P. Stuckenberg and M.E. Irwin (2♂1♀, NMSA); Natal, Van Reene, Drakensberg, xi.1926 (1♀, BMNH); Natal, Creytown, x.1931, A. Mackie (1♂, BMNH); Natal, Willow Grange, 3.v.1914, R.C. Wroughton (1♂2♀, BMNH); Orange Free State, Oranjekrag, at Orange River, 15.viii.1973, 1,300m, M.E. Irwin (1♀, NMSA); Otterford Forestry Reserve, Hankey Area, 1.10.xii.1967, B. and P. Stuckenberg (2♂3♀, NMSA); Pietermaritzburg, Town Bush, B. and P. Stuckenberg (1♂2♀, NMSA); Pretoria, 19.vi.1906, C. Swierstra (1♂, NMSA); Royal Natal National Park, Drakensberg Mts., i.1962, B. and P. Stuckenberg (1♀, NMSA); Transvaal, Graskop (9km N), 6.xii.1976, R. Miller (1♀, NMSA); Transvaal, Gladdespruit River, near Asbestos Mine, 3.xi.1970, P. Stuckenberg (1♀, NMSA); Transvaal, Kruger National Park, x.1931 (1♂, BMNH); Transvaal, Bcononi, Zielke/Ledger, 27.vi.1969 (1♀, BMNH); Transvaal, near Sibasa, 24.x.1978, host: *Scantius forsteri* var. *centralis* Sign., B. Levey (1♀, BMNH); Transvaal, Sabie (5km W), Lone Creek River, 5.xii.1976, R. Miller (1♂, NMSA); Uitenhage, x.1931 (1♂, BMNH); Willowmore, Capland, 20.ii.1916 and 12.i.1917, Brauns (2♂1♀, NMSA); Winburg (42km SW), 20.iii.1991, Londt and Whittington (1♂, NMSA); **ZIMBABWE:** N. Vumba, 22.vi.1964 and 2.1.1966, D. Cookson (1♂1♀, NMSA); Salisburg, 4-1-24, host: *Sladioli* sp. (1♂, AMNH); Salisburg, 14.vi.1932, A. Cuthbertson (1♂, AMNH); South Zimbabwe, 13.vii.1964, D. Cookson (2♂, NMSA).

#### HOSTS

*Sladioli* sp. (Hemiptera): - Zimbabwe (new record).

*Scantius forsteri* var. *centralis* Sign. (Hemiptera): - South Africa (new record).

#### ETYMOLOGY

*Phasia nasuta* is named for the strongly projecting lower facial margin.

#### NOTE

This species has also been reported from Mozambique, Ethiopia, and N. Africa (Crosskey 1980: 824).

#### 3.2.9 *Phasia nigrofimbriata* (Villeneuve, 1935), comb. nov.

(Figures I-41, II-2.1)

*Mormonomyia nigrofimbriata* Villeneuve, 1935: 252.

*Mormonomyia claripennis* Villeneuve, 1935: 253.

*Mormonomyia fumosa* Villeneuve, 1935: 253.

*Hyalomyia negator* Curran, 1936: 11.

*Alophora nigrofimbriata*: - Emden 1945: 433 (revision).

*Alophora (Mormonomyia) nigrofimbriata*: Crosskey 1980: 824 (catalog).

## DESCRIPTION

Body length: 3-6 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity. Frontal vitta black and divergent. Frontal vitta at base of antennae 1-1.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, and as wide as first flagellomere. Lower margin of face, black, shining, not pruinose. Vibrissa well differentiated; intervibrissal distance 1.2-1.3 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.3-1.4 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 3.1-3.2 times its width. Occiput flattened; greyish yellow pruinose; hairs black. Palpus brown.

**THORAX.** Mesoscutum very thinly pruinose, with fine black hairs. 0+1(2) acrostichal setae; 0+2 dorsocentral setae; 2-3 postpronotal setae; presutural supra-alar seta present, strong (or fine); 1 postsutural intra-alar seta; notopleural setae 2 or scale-like; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like setae present. Anepimeral setae medium size, black; 2 katepisternal setae; 6-8 meral setae. Scutellum black; shining, without pruinosity, with one pair of marginal setae; discal setae arranged in one row. Subscutellum very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base with scale-like setae. Tegula black. Basicosta black. Wing hyaline or pictured; narrow or broad; petiole of apical cell 0.34 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarsus normal; black. Fore claws brown; as long as fifth tarsomere. Pulvilli yellow. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1 *pd* and 1 *v*. apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae sometime present. Hind tibia black, with 2-3 *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites black, purple shining; longitudinal vitta absent; outside of tergites grey pruinose. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1;1:1; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots distinct. **TERMINALIA.** Syncercus broad, triangular, with a widely semicircular notch and a pair of median teeth posteriorly; apex bent ventrally. Surstylus straight, broadened apically, longer than cercus. Ejaculatory apodeme small. Hypandrium longer than phallapodeme. Phallapodeme laterally flattened on basal 1/2, and arched in profile view. Pregonite reduced, even, haired ventrally. Postgonite long, pointed; haired ventrally. Phallus shorter than hypandrium, not

haired. Epiphallus distinct. Distiphallus partly sclerotized, apex with a pair of reversed teeth.

**FEMALE:** Eyes touching. Anterior spine-like setae of hind tibia absent. Tergites IV, V grey pruinose. Sternite VII (sheath) sharply pointed; not bent, apex straight; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Mormonomyia nigrofimbriata* Villeneuve, 1935. Holotype ♂, [SOUTH AFRICA], Transvaal, 12.90, [head glued on the label] (CNCI, examined).

*Mormonomyia fumosa* Villeneuve, 1935. Holotype ♂, S. Rhodesia [= ZIMBABWE], Bulawayo, 7.10.1923, R. Stevenson (CNCI, examined).

*Mormonomyia claripennis* Villeneuve, 1935. Holotype ♂, [locality unknown], labelled as "Brit. E. Empr. Nakuta., Jan. 1913, DTBL, van Sorneren" (CNCI, examined).

*Hyalomyia negator* Curran, 1936. Holotype ♂, Southern Rhodesia [=Zimbabwe], 7.i.1935, R.H.R. Stevenson (AMNH, not examined).

#### OTHER MATERIAL EXAMINED

**BELGIAN CONGO:** Elizabethville, 11-17.ix.1931, J. Ogilvie (1♀, BMNH). **BOTSWANA:** Makarikari Pens., 22-23.iv.1972 (1♀, BMNH); L. Ngami, Sehithwa (12mi NE), 16-17.iv.1972 (1♀, BMNH); Moremi Reserve [?], 20.iv.1972 (1♀, BMNH). **MALAWI:** Nyasaland [= Malawi], ix.1916, R.C. Wood (1♂3♀, BMNH). **NIGERIA:** Zaria, Samaru, 11.i-25.ii.1970, 16.ii.1972, 31.xii.1969 and 12.ii.1967, J.L. Musa and J.C. Deeming (6♂6♀, BMNH, CNCI); near Funtua, Mairuwa dam., 25.iii.1973, L.V. Knutson (1♀, USNM); [no more data], 19.viii.1952, R.W. Meyer (2♀, BMNH). **SOUTH AFRICA:** Natal, Pietermaritzburg, Town Bush, ix.1976, R. Miller (1♀, NMSA); Natal, Weenen, xi.1928-iii.1927, H.P. Thomasset (1♀, BMNH); Transvaal, Lebowakgoma, 15.vii.1988, B.J. Sinclair (12♂3♀, DEBU, LACM); Transvaal, Zebediela, v.1935, I.B. Kok (1♂, NMSA); Zululand, Matubatuba, 7-8.iv.1960, B. and P. Stuckenberg (1♀, NMSA). **TANZANIA:** Tanganyika, Old Shinyanga, 2.v.1951 and 27.iv.1956, E. Burt (3♂, BMNH). **UGANDA:** Kawanda [?], 26.viii.1961 (5♂1♀, NMSA). **ZIMBABWE:** Salisbury, on Daisy, 14.vi.1932, A. Cuthbertson (1♀, AMNH).

#### HOST

Unknown.

#### NOTES

This species has also been reported from Zaire (Crosskey 1980: 824).

**3.2.10 *Phasia nigromaculata* Sun, sp. nov.**

(Figure I-34.5-8, II-1.1)

**TYPE MATERIAL**

Holotype ♀, [SOUTH AFRICA]. W Cape, Ceres District, N Gydo Pass, Clanwillam Rd., 1.x.1959, Stuckenberg (NMSA); paratypes, 1 ♀, SOUTH AFRICA, Cape, Bredasdorp National Res., 24.ix.1979, J. Londt (NMSA); 1 ♀, SOUTH AFRICA, Cape, Silver Sands, 2km W Betty's Bay, 23.ix.1979, J. Londt (NMSA); 1 ♀, [SOUTH AFRICA], W Cape, Cape Point Nature Res., Cape Peninsula, 25.ix.1959, B. and P. Stuckenberg (NMSA).

**DESCRIPTION**

Body length: 2.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black with grey pruinosity. Frontal vitta reddish brown, divergent. Frontal vitta at base of antennae 2 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity; bare; 0.6 times as wide as first flagellomere. Lower margin of face strongly projecting, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 2.8 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum very thinly pruinose, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, and without scale-like setae. Anepimeral setae medium size; black. 2 katapisternal setae. 4-6 meral setae. Scutellum black; shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct, arranged in one row. Subscutellum very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 1 *p*, apically with 1 *av*, 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1 *p* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with one row of *ad* and *pd*. Anterior spine-like setae of hind tibia present.

**ABDOMEN.** Abdominal tergites black; pruinosity silvery; longitudinal vitta absent; syntergite I+II and median part of tergite III form a big black spot, tergites IV, V grey pru-

inose. Anterior spine-like setae of hind tibia present. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.6:1:1:0.8. Hair spots indistinct.

**TERMINALIA.** Sternite VII (sheath) longer than sternite VI; apex broadened; not bent, straight; sternite VII with linear wrinkles ventrally on apical half. Ovipositor bent upward.

**MALE:** Unknown.

## HOST

Unknown.

## ETYMOLOGY

The specific name refers to the big black spot on tergites I+II, III of the abdomen.

### 3.2.11 *Phasia sensua* (Curran, 1927), comb. nov.

(Figures I-54, II-2.4)

*Strongylogaster sensua* Curran, 1927: 354.

*Hyalomyia lativentris* Malloch, 1929: 110, **syn. nov.**

*Hyalomyia sensua*: Malloch 1930: 98.

*Alophora (Mormonomyia) lativentris*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora (Mormonomyia) sensua*: Crosskey 1973: 110 (catalog); - Cantrell and Crosskey 1989: 735 (catalog).

## DESCRIPTION

Body length: 4.0 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black, greyish yellow pruinose. Frontal vitta triangle, reddish brown. Frontal vitta at base of antennae 1.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black, greyish yellow pruinose, bare; 0.9 times as wide as first flagellomere. Lower margin of face black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.3 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/10. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining. Antenna black; first flagellomere 1.4 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 3.1 times its width. Occiput flattened, white pruinose; hairs black; median occipital sclerite bare. Palpus black.

**THORAX.** Mesoscutum thinly greyish yellow pruinose, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, but fine; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron grey and yellow pruinose; hairs black; and without scale-like setae. Anepimeral setae strongly; black; 1 katepisternal seta; 6-7 meral setae. Scutellum black;

greyish yellow pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae arranged in 2-3 rows. Subscutellum very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow, or brown. **LEGS.** Fore femur black, swollen. Fore tibia brown to black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws brown; 1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia slightly arched; black, with 3 *pd* and 4 *ad*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent; syntergite I+II and median area of tergite III purple shining, without pruinosity. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.3:1:0.9:0.6. Pruinosity of tergites IV, V silvery; hair spots indistinct. **TERMINALIA.** Syncercus "H-like", with a U-shaped notch posteriorly, apex strongly bent ventrally. Surstylus flattened, slender, broadened on apical 1/3, bent dorsally. Ejaculatory apodeme small, knob-like. Hypandrium shorter than phallapodeme. Pregonite small, sparsely haired dorsally. Postgonite long, pointed. Phallus broad, 1.2 times as long as hypandrium, haired dorsally. Distiphallus straight, well sclerotized.

**FEMALE.** Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia present. Syntergite I+II and III shining, without pruinosity, tergites IV, V greyish yellow pruinose. Sternite VII (sheath) longer than sternite VI; narrow apically; slightly bent, apex directed dorsally; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Strongylogaster sensua* Curran, 1927. Holotype ♀, AUSTRALIA, Queensland, Palmerston (DEIC, not examined).

*Hyalomyia lativentris* Malloch, 1929. Holotype ♂, AUSTRALIA, N. Queensland, Cairns (J.F. Illingworth Collection) (USNM, No. 41635, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRALIA. New South Wales:** Cobar, 6.iii.1975, K. Grier (1♀, QDPC); Wilton, 12.1.1966, V.J. Robinson (1♀, NSW); Sydney, Bridwell Collection, (1♀, USNM). **Queensland:** 1km Mt. Molloy, 15.iv.1980, G.F. Hevel and J.A. Fortin (1♀, USNM); Biloela, 6.xii.1926, E. Ballard (1♀, BMNH); Herberton, i.1911, (1♂, BMNH); Mission Beach, 128 km S Cairns, 19-20.i.1964, J. Sedlacek (1♂, BPBM); Mt. Tamborine, A.M. Lea (1♀, SAMA); N Somerset Cape York, 3.ix.1968, R.E. Tovey (1♂1♀, AMSA); N Townsville, 13.viii.1919, G.F. Hill (2♂2♀, SAMA); N Clare, 23.vi.1987, J.D. Brown (1♂1♀, QDPC); SE Flagstone Creek, 2.xii.1972, B. Cantrell (1♀, UQIC). **South Australia:** Clare, 23.vi.1987 and 25.v.1987, L. Kay, host: *Eysarcoris trimaculatus*. (2♂, QDPC).

**PHILIPPINES.** Albay Province, Libon, Caguscos, 200m, 17-20.v.1965 (1♂2♀, BPBM, [1♂, labeled as light trap]). **DOUBTFUL LOCALTY:** "Illumild Tinillum (?), (1♀, ANIC)".

#### HOST

*Eysarcoris trimaculatus* (Distant). (= *Stollia trimaculatas*) (Hemiptera, Pentatomidae):  
- Australia (South Australia, new record).

#### NOTES

*Phasia sensua* is an Australasian species and was described by Curran (1927) based on a single female specimen. *Hyalomyia lativentris*, newly synonymised with *Phasia sensua*, was described by Malloch (1930) based on male specimens.

### 3.3. The *Phasia barbifrons* species-group

The *Phasia barbifrons* species-group includes all the species previously placed in the subgenera *Stackelbergella* Draber-Mońko (Draber-Mońko 1965) and *Barbella* Draber-Mońko (Draber-Mońko 1965).

**Diagnosis:** Eyes separated by a distance equal to or larger than ocellus (male); fronto-orbital plate haired laterally, strongly swollen; dorsal facets of eye larger than ventral ones; inner margins of eye divergent; gena and occiput hairs black. Length of oral opening always less than 2.5 times width. Thorax black, shining or thinly pruinose. Scutellum black, with two pairs of marginal setae. Basicosta brown to black. Abdomen black, subovate. Male surstylus longer than cercus, straight; epiphallus and distiphallus partly sclerotized; postgonite well developed, apex pointed.

#### Key to species of the *Phasia barbifrons* species-group

(The males of *Phasia malaisei*, *Phasia sichuanensis*, *Phasia wangi* and *Phasia frontata* and the female of *Phasia serrata* are unknown)

1. Male ..... 2
- Female ..... 5
2. Genal groove well developed ..... 3
- Genal groove not developed ..... 4
3. Antenna long, at least 1/2 facial height, almost reaching vibrissal angle; syncercus deeply notched posteriorly; eyes separated by a distance greater than width of ocellar triangle ..... *P. bifurca* Sun, new species ♂
- Antenna shorter, less than 1/2 facial height; syncercus shallowly notched posteriorly;

- eyes separated by a distance less than width of ocellar triangle .....  
 ..... *P. rohdendorfi* (Draber-Mońko, 1965) ♂
4. Surstylus broadly flattened; apex of cercus without sawtooth .....  
 ..... *P. barbifrons* (Girschner, 1887) ♂
- Surstylus not broadly flattened; apex of cercus with sawtooth .....  
 ..... *P. serrata* Sun, new species ♂
5. Sternite VII bent, apex directed ventrally ..... 6  
 - Sternite VII straight or slightly bent upward ..... 7
6. Apex of sternite VII strongly bent ventrally; sheath thick .....  
 ..... *P. sichuanensis* Sun, new species ♀
- Apex of sternite VII slightly bent ventrally; sheath thin and canoe-like .....  
 ..... *P. malaisei* Sun, new species ♀
7. Eyes touching ..... 9  
 - Eyes separated ..... 8
8. First flagellomere long, almost reaching vibrissal angle, 1.6-1.7 times as long as pedicel; distance between eyes equal to width of ocellar triangle .....  
 ..... *P. bifurca* Sun, new species ♀
- First flagellomere short, less than 1.5 times as long as pedicel; distance between eyes less than width of ocellar triangle ..... *P. rohdendorfi* (Draber-Mońko, 1965) ♀
9. Sternite VII laterally flattened, 1.8 times as long as sternite VI; genal groove well developed .....  
 ..... *P. wangi* Sun, new species ♀
- Sternite VII dorsoventrally flattened, less than 1.4 times as long as sternite VI; genal groove not developed ..... *P. frontata* Sun, new species ♀

### 3.3.1 *Phasia barbifrons* (Girschner, 1887)

(Figures I-10, II-6.4)

*Alophora (Hyalomyia) barbifrons* Girschner, 1887: 36.

*Hyalomyia barbifrons*: Dupuis 1955: 89-93 - 1963: 105.

*Alophora (Barbella) barbifrons*: Draber-Mońko 1965: 185 (redescription).

*Phasia (Phasia) barbifrons*: Herting 1984: 168 (catalog) - Herting and Dely-Draskovits 1993: 410 (catalog).

#### DESCRIPTION

Body length: 3-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance slightly larger than or as wide as single ocellus. Fronto-orbital plate black, conspicuously swollen, grey pruinose (thinly), several rows of hairs laterally (reaching to eyes). Frontal vitta triangular, black. Frontal vitta at base of antennae 0.8-0.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae present. Face black with grey pruinosity. Parafacial black with grey pruinosity, haired; 1-1.2 times



as wide as first flagellomere. Lower margin of face black, projecting, visible in profile, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.4-1.6 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 5/8. Gena black with grey pruinosity; hairs black; height 0.13-0.15 times eye height. Lunule normal; sublunular bulla indistinct. Antenna black; first flagellomere 1.2-1.3 times as long as pedicel; arista thickened on basal 0.4-0.5. Length of oral opening 1.4-1.6 times its width. Occiput flattened, greyish yellow pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae medium size; black. 2 katepisternal seta. 5-8 meral setae. Scutellum black; shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; on apex; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.3-0.35 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow or brown. **LEGS.** Fore femur black; hairs black. Fore tibia black; 0 *ad*; 0 *a*; 0 *av*; 0 *v*; 0 *pv*; 0 *p*; 0 *pd*; 1 *d* (apical). Fore tarus black. Fore claws black; 0.9-1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black; 2 *ad* (1 apical); 1 *a* (apical); 1 *av* (apical); 1 *pv* (apical); 2 *p* (1 apical); 0 *pd*; 2 *v* (1 apical); 1 *d* (apical). Hind femur black; hairs black; scale-like setae absent. Hind tibia black; with 5 *ad*, 4 *pd*, 0 *v*. **ABDOMEN.** Abdominal tergites black, with thin grey pruinosity only. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.5:1:1:0.6. Hair spots indistinct. **TERMINALIA.** Syncercus with a shallow notch posteriorly and a pair of hooks posteroventrally. Surstylus flattened, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallapodeme. Postgonite long, pointed. Pregonite reduced, but broad, with sparse hairs dorsally. Phallus slender, 1.2-1.3 times as long as hypandrium, with fine hairs dorsally. Distiphallus not well sclerotized.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI; thin, broadly flattened; broad apically; slightly bent, apex directed ventrally; almost smooth ventrally. Ovipositor slightly bent downward.

#### TYPE MATERIAL

*Alophora (Hyalomyia) barbifrons* Girschner, 1887. Syntype, 1 ♀, 'Ex Girschner Collection/C.J. Wainwright Collection, B.M.1948-488' (BMNH, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRIA.** Sonnblickgruppe, Südseite, subalpin, H. Franz (1 ♀, CNCI). **CHINA.**

Shanxi Prov., Mianshan, 20.viii.1982, N. Liu (1♀, IZAS); Tibet, 1983. Y. Han (1♀, IZAS). **FRANCE.** Richelieu, 17.vi.1962, on flowers of *Chaerophyllum temulum*, (1♀, USNM); Richelieu, 3.ix.1964, on flowers of *Angelieu sylvestris*, (1♂, USNM). **SLOVAKIA.** Bratislava, Malé Karpaty, 31.viii.1990, Tschorsnig (1♂1♀, DEBU). **SPAIN.** Prov. Lérida, Vall d'Aran, Artien, 29.vi.1992, Tschorsnig (1♀, GUC). **SWITZERLAND.** Grengiols, Wallis, 30.viii. 1963, ex: Mesnil Collection (1♂, CNCI). **VIETNAM.** Lai Chau Prov., Mt. Phang Si Pang, N. Ridg., 1,970m, 8.x.1995, H. Kurahashi (1♂, NIHJ).

#### HOST

Unknown.

#### NOTES

*Phasia barbifrons* (Girschner) occurs in Austria, France, Germany, Switzerland, Poland, Russia (Far East) (Draber-Moňko 1965: 181 and Herting 1984: 168), Spain, Slovakia, China and Vietnam.

#### 3.3.2 *Phasia bifurca* Sun, sp. nov.

(Figures I-11, II-6.3)

#### TYPE MATERIAL

Holotype ♂, CHINA, Yunnan, Zhongdian, Daixueshan, Yakou, 4,000m, 15.viii.1981, X. Zhang (IZAS); allotype ♀, CHINA, Sichuan, Wolong, 2,200m, 7.ix.1986, Y. Wang (IZAS); paratypes, 3♂, same as allotype (IZAS); 1♀, same as holotype (IZAS).

#### DESCRIPTION

Body length: 5-7 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance larger than or as wide as ocellar triangle. Fronto-orbital plate swollen, black, shining, or grey pruinose (thinly), several rows of hairs laterally (densely, reaching to eyes). Frontal vitta parallel, narrow, black. Frontal vitta at base of antennae 0.25-0.3 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae present. Face brown to black with grey pruinosity. Parafacial brown to black, without distinct pruinosity; haired; 1.9-2.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile; orange yellow; shining, without pruinose. Vibrissa not differentiated; intervibrissal distance 1-1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena black with grey pruinosity; hairs black; height 0.18-0.2 times eye height. Lunule normal; sublunular bulla indistinct. Antenna black, reaching to over half facial height; first flagellomere 1.5-1.6 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 1.5-1.7 times its width. Occiput flattened, without distinctly pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 0+1(2) dorsocentral setae; 1-3 postpronotal setae; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 post-alar setae. Pleuron thinly grey pruinose; hairs black; scale-like hair absent. Anepimeral setae medium size; black; 1 katepisternal seta; 4-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured; white with light brown infuscation, narrow; petiole of apical cell 0.15-0.18 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow, or brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 1 *ad* and 2 *p*, apically with 1 *ad*, 1 *a*, 1 *v*, 1 *pv*, 1 *p*, 0-1 *pd* and 1 *d*. Fore tarus black. Fore claws black; 0.9-1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1 *v* and 2 *p*, apically with 1 *ad*, 1 *v*, 1 *pv*, 1 *p*, 1 *pd* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 4-6 *ad* and 4 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin (shining); longitudinal vitta distinctly present (grey). Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.4:1:1:0.6. Hair spots indistinct. **TERMINALIA.** Syncercus long, deeply V-notched posteriorly. Surstylus spoon-like, slightly longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium strong, with two strong thorns ventrally; longer than phallus and phallapodeme. Pregonite reduced, apex with sparse hairs. Postgonite well developed, bent ventrally. Phallus short, with fine hairs dorsally. Ventrolateral process short, well sclerotized; dorsolateral process membranous, but slightly arched.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as ocellar triangle; not touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI; tapered; pointed; bent, apex directed dorsally; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### HOST

Unknown.

#### ETYMOLOGY

Latin "*bifurca*" refers to the cerci, which are separated by a deep V-notch posteriorly.

**3.3.3 *Phasia frontata* Sun, sp. nov.**

(Figures I-20, II-7.1)

**TYPE MATERIAL**

Holotype ♀, [AUSTRALIA], N.S.W., 21-7 km SE Tness Ways, Coachwood Gully, (32°49', 150°26'), 31.xii.1977, G. Daniels (AM).

**DESCRIPTION**

Body length: 3 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black, greyish brown pruinose, swollen; 1-2 rows of hairs laterally. Frontal vitta black, triangular. Frontal vitta at base of antennae 3 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.15 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 4.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.6 times as long as pedicel; arista thickened on basal 0.66. Length of oral opening 1.4 times its width. Occiput flattened; greyish yellow pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum thinly greyish brown pruinose, with fine black hairs. 0+1 acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like hair absent. Anepimeral setae strongly; black; 2 katepisternal setae; 3-4 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 0.8 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, apically with 1 *a*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with one row of *ad* and 3 *pd*. Anterior spine-like setae of hind tibia well developed.

**ABDOMEN.** Abdominal tergites black; pruinosity absent (shining); longitudinal vitta absent; lateral margin with several long setae. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:0.8; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots indistinct. Sternite VII (sheath) longer than sternite VI; tapered; narrow apically; not bent, apex straight. Ovipositor bent upward.

**MALE:** Unknown.

#### **HOST**

Unknown.

#### **ETYMOLOGY**

*Phasia frontata* is named for the extremely wide frontal vitta.

#### **3.3.4 *Phasia malaisei* Sun, sp. nov.**

(Figures I-33, II-6.3)

#### **TYPE MATERIAL**

Holotype ♀, BURMA [N.E.], Kambaiti, 7,000ft, 2.v.1924, R. Malaise, ex: L.P. Mesnil Collection 1986 (CNCI).

#### **DESCRIPTION**

Body length: 3.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, 5 rows of hairs laterally (reaching to eyes). Frontal vitta triangular, black. Frontal vitta at base of antennae 1.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, upper part haired; 1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 3/5. Gena brown to black with grey pruinosity; hairs black; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.5 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 1.3 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like setae absent. Anepimeral setae medium size; black; 2 katapisternal seta; 3-4 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.4 times as long as

preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 0.8 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *pd* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black without anterior spine-like setae, with 4 *pd* and 7-8 *ad*.

**ABDOMEN.** Abdominal tergites black; pruinosity absent; longitudinal vitta absent; tergites III, IV and V with a row of long marginal bristles respectively. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:0.9:0.4; relative width I+II:III:IV:V = 0.7:1:0.9:0.8. Hair spots indistinct. Sternite VII (sheath) longer than sternite VI, canoe-like, narrow apically, not bent, apex almost straight; shining smooth ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name is a patronym in honour of the collector, R. Malaise.

#### 3.3.5 *Phasia rohdendorfi* (Draber-Moňko, 1965)

(Figures I-51, II-6.4)

*Alophora* (*Stackelbergella*) *rohdendorfi* Draber-Moňko, 1965: 181.

*Phasia* (*Phasia*) *rohdendorfi*: Herting 1984: 169 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog).

#### DESCRIPTION

Body length: 5-8.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, several rows of hairs laterally (densely, reaching to eyes). Frontal vitta extremely narrow, reddish brown. Frontal vitta at base of antennae 0.3-0.35 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae present. Face brown to black with grey pruinosity. Parafacial brown to black with grey pruinosity; densely haired; 3-4 times as wide as first flagellomere. Lower margin of face slightly projecting, or perpendicular, not projecting; brown to black with grey pruinosity. Vibrissa not differentiated; intervibrissal distance 0.7-0.8 times distance between vibrissa and eye on same side; facial ridge with bristles on whole height. Gena brown to black with grey pruinosity; hairs black; height 0.35-0.4 times eye height. Lunule normal; sublunular bulla indistinct.

Antenna black; first flagellomere 1.4-1.6 times as long as pedicel; arista thickened on basal 0.4-0.45. Length of oral opening 1.4-1.5 times its width. Occiput flattened, without distinct pruinosity; hairs black. Palpus black.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 0(1)+1 dorsocentral setae; 1-3 postpronotal setae; presutural supra-alar seta present, but fine; 0-1 postsutural intra-alar seta; 0-2 notopleural setae; 0-1 supra-alar seta; 0-2 postalar setae. Pleuron thinly grey pruinose; hairs totally black and brown; and without scale-like setae. Anepimeral setae hair-like, black; 0-1 katepisternal seta; 9-14 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured, white with light brown infuscation, narrow; petiole of apical cell 0.2-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 3 a, apically with 0-1 *ad*, 1 *a*, 1 *pv*, 0-1 *pd* and 1 *d*. Fore tarsus black. Fore claws black; 1-1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1-2 *ad*, 3 *p*, 1-2 *v*, apically with 1 *ad*, 1 *a*, 0-1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 6-7 *ad* and 5 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta distinctly present (grey pruinose), with narrow transversal grey pruinosity between tergites. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.4:1:1:0.6. Hair spots indistinct. **TERMINALIA.** Syncercus broad, V-notched posteriorly. Surstylus flattened, broadened on apical half, upward, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallopodeme. Pregonite needle-like. Postgonite long, as long as pregonite, bent ventrally. Phallus 1.1-1.2 times as long as hypandrium, without fine hairs. Epiphallus well developed, bent ventrally. Distiphallus partly sclerotized.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes separated by a distance as wide as ocellar triangle; not touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI, tapered, narrow apically, bent, apex directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora (Stackelbergella) rohdendorfi* Draber-Moňko, 1965. Holotype ♀, [RUSSIA], am Wege Spask-Jakovlevka bei Ugodinza-Fluss, 22.vi.1927, A.A. Stackelberg (St. Petersburg, not examined).

#### OTHER MATERIAL EXAMINED

**CHINA.** Sichuan, nr. Mupin, 1,200-1,400ft, 20.vii. D.C. Graham (1♂, USNM); Sichuan, Nanping and Wolong, 2,200-2,400m, 7.ix. and 22.ix.1986, Y. Wang (27♂13♀,

IZAS); Tibet, Mêdog, 621m, 23.viii.1982, Y. Han (3♂, IZAS); Tibet, Mêdog, Gutang, 2,000m, 3.x.1982, Y. Han (1♂, IZAS); Yunnan, Zhongdian, 3,200m, 8.viii.1981, X. Zhang (1♂, IZAS). 1♂, [CHINA], Manshukuo, Gaolinzsy, 2-8.vii.1939, W. Alin [DEIC, this specimen was not included in Draber-Moňko's type series (Draber-Moňko, 1965), but bears her determination label and paratype label). **NEPAL**. Phulchki, 2,762m, 18-21.ix.1987, M. Limbu (1♂, BLKU).

#### HOST

Unknown.

#### 3.3.6 *Phasia serrata* Sun, sp. nov.

(Figures I-55, II-7.1)

#### TYPE MATERIAL

Holotype ♂, PHILIPPINES, Negros OR., Mt. Talinas, 1,000m, 29-31. 1960, H. Torre-villas (BMBP); paratype 1♂, PHILIPPINES, Luzon, Dalton Pass, 915m, Nueva Vizcaya, 9-10.iv.1968, (Malaise trap) D.E. Hardy and M.D. Delfinado (BMBP).

#### DESCRIPTION

Body length: 3 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance 0.5 times as wide as ocellar triangle. Fronto-orbital plate black, blackish grey pruinose; 6-7 rows of hairs laterally (reaching to eyes). Frontal vitta black. Frontal vitta at base of antennae 0.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae present. Face black with grey pruinosity. Parafacial black with grey pruinosity; upper part haired; 1.6-1.7 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.9-2.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 3/5. Gena brown and black with grey pruinosity; hairs black and white; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 1.4 times its width. Occiput flattened, white pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum black, strongly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1-2 supra-alar setae; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae hair-like, black; 2 katepisternal setae; 6-8 meral setae. Scutellum black; blackish grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not



very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured; white with light brown infuscation, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *v*, 1 *pv* and 1 *d*. Fore tarus black. Fore claws black; 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 6 *pd* and 4 *ad*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus triangular, shallowly notched posteriorly; apex with a pair of saw teeth. Surstylus slender, straight, much longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium broad, shorter than phallapodeme. Pregonite spherical. Postgonite long and sharp pointed. Epiphallus well developed. Phallus slender, longer than hypandrium, basal half haired dorsally. Distiphallus partly sclerotized.

**FEMALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

The Latin "*serrus*" means sawteeth, referring to the cerci, which have a pair of sawteeth posteriorly.

#### 3.3.7 *Phasia sichuanensis* Sun, sp. nov.

(Figures I-57.1-5, II-6.3)

#### TYPE MATERIAL

Holotype ♀, CHINA, Sichuan, Yanyuan, 2,200m, 15.x.1986, Y. Wang (IZAS).

#### DESCRIPTION

Body length: 3.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black, swollen, grey pruinose; 5 rows of hairs laterally (reaching to eyes). Frontal vitta triangular, yellow. Frontal vitta at base of antenna 1.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial lower part yellow, but upper part brown to black with grey pruinosity, haired (on upper part), 1.4 times as wide as first flagellomere.

Lower margin of face projecting, visible in profile, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena black with grey pruinosity; hairs black; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna yellow; first flagellomere 1.05 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 1.4 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+2 acroschital setae; 1+2 dorsocentral setae; 2 postpronotal setae; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae medium size, black; 1 katepisternal seta; 5-6 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.4 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws black; 0.9 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*. apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black without anterior spine-like setae, with 7-8 *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity absent; longitudinal vitta absent; tergites IV, V with long marginal bristles. Hair spots indistinct. Sternite VII (sheath) narrow apically, bent, apex directed ventrally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name is derived from the type locality, Sichuan Province, China.

#### NOTES

The female terminalia of the holotype are stored in glycerine in a micro vial.

**3.3.8 *Phasia wangi* Sun, sp. nov.**

(Figure I-57.6-10, II-6.3)

**TYPE MATERIAL**

Holotype ♀, CHINA, Sichuan Province, Wolong, 2,000m, 8.ix.1986, Y. Wang (IZAS).

**DESCRIPTION**

Body length: 7 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black, swollen, grey pruinose; 10-11 rows of hairs laterally (reaching to eyes). Frontal vitta extremely narrow, red. Frontal vitta at base of antennae 0.3 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial brown, grey pruinose, haired; 2.8 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.9 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena brown, grey pruinose; hairs black; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 1/4. Length of oral opening 1.3 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow.

**THORAX.** Mesoscutum thinly pruinose, without longitudinal vitta, with fine black hairs. 0+2 Acrostichal setae; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae strongly, black; 1 katapisternal seta; 5-9 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.15 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 5 *p*, apically with 1 *ad*, 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 0.8 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 4 *p* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 7 *pd* and one row of *ad*. Anterior spine-like setae of hind tibia present.

**ABDOMEN.** Abdominal tergites black; pruinosity absent; longitudinal vitta absent; tergite IV with one row of long marginal bristles. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:0.6; relative width I+II:III:IV:V = 0.4:1:0.9:0.7. Hair spots indistinct. Sternite VII (sheath) 1.8 times longer than sternite VI, knife-like, slightly bent, apex directed dorsally; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

**HOST**

Unknown.

**ETYMOLOGY**

This specific name is a patronym in honour of Mr. Y. Wang who collected the type specimen when he was in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

**3.4. The *Phasia hemiptera* species-group**

The *Phasia hemiptera* species-group comprises part of the previous subgenus *Phasia* (*sensu* Herting 1984).

**Diagnosis:** Head compressed anteriorly or spherical; eyes separated by distance usually larger than width of single ocellus; fronto-orbital plate not swollen, with over 3 rows of hairs laterally, sometimes reaching eye; dorsal facets of eye larger than ventral facets; parafacial wide, bare. Lower margin of face perpendicular or projecting; Sublunular bulla indistinct; first flagellomere short; oral opening short. Thorax black, shining to strongly pruinose; scale-like setae absent. Scutellum yellow or black, with two pairs of marginal setae. Abdomen subovate, black or with yellow spots. Male phallus short or long, haired or bare. Female sternite VII variable in shape.

**Key to species of the *Phasia hemiptera* species-group**

(Females of *Phasia godfreyi*, *Phasia transvaalensis*, and *Phasia yunnanica* are unknown.)

1. Males ..... 2
- Females ..... 22
2. Mesoscutum with a distinct golden pruinose spot, at least on the median postsutural part; tergite V with V-shaped golden pruinosity posterolaterally ..... 3
- Mesoscutum evenly pruinose, or with vitta-like pattern; tergite V without such pruinosity ..... 4
3. Lower margin of face strongly projecting, pruinose spot usually limited to postsutural scutum; surstylus straight; distiphallus swollen, not branched ..... *P. aurulans* (Meigen, 1824) ♂
- Lower margin of face slightly projecting, pruinose spot usually covering most of mesonotum, two broad black vittae across suture; surstylus strongly bent upward; dis-

- tiphallus branched ..... *P. aurigera* (Egger, 1860) ♂
4. 1+1 or 1+2 katepisternal setae ..... 5
- 0+0 or 0+1 katepisternal seta ..... 13
5. Abdominal tergites strongly shining, pruinosity absent; syncercus slender, surstylus strongly bent upward (Fig. I-63) ..... *P. takanoi* (Draber-Mońko, 1965) ♂
- Abdominal tergites at least thinly grey pruinose; syncercus short, surstylus not strong bent upward ..... 6
6. Surstylus straight or bent downward posteriorly ..... 7
- Surstylus strongly bent upward posteriorly ..... 10
7. Abdominal tergites with orange-yellow area on tergites I+II, III and IV ..... 8
- Abdominal tergites totally black ..... 9
8. Phallus about 1.5 times as long as hypandrium; syncercus slender, almost as long as surstylus; pregonite well developed ..... *P. zimini* (Draber-Mońko, 1965) ♂
- Phallus over 2 times as long as hypandrium; syncercus much shorter than surstylus; pregonite even apically, reduced ..... *P. transvaalensis* Sun, new species ♂
9. Syncercus deeply notched posteriorly; M meeting  $R_{4+5}$  at acute angle.....
- ..... *P. grandis* (Coquillett, 1897) ♂
- Syncercus not or shallowly notched posteriorly; M meeting  $R_{4+5}$  almost at right angle
- ..... *P. diversa* (Coquillett, 1897) (in part) ♂
10. Hind tarsi with dense fine golden yellow hairs ventrally ..... *P. yunnanica* Sun, new species ♂
- Hind tarsi without such hairs ..... 11
11. Distiphallus not branched ..... *P. kudoii* Sun, new species ♂
- Distiphallus branched ..... 12
12. Dorsolateral process of distiphallus with two pointed branches ..... *P. grazynae* (Draber-Mońko, 1965) ♂
- Dorsolateral process of distiphallus not branched posteriorly ..... *P. albopunctata* (Baranov, 1935) ♂
13. All fronto-orbital setae yellow ..... *P. piceipes* (Wulp, 1892) ♂
- Fronto-orbital setae black, or with only a few yellow ..... 14
14. Abdomen with yellow or dark yellow area; M meeting  $R_{4+5}$  at acute angle ..... 15
- Abdomen totally black; M meeting  $R_{4+5}$  almost at right angle ..... 17
15. Lower margin of face projecting; pleuron of thorax without dense yellow hairs ..... *P. japonensis* Sun, new species ♂
- Lower margin of face perpendicular; pleuron of thorax usually with dense yellow hairs ..... 16
16. Frons wider than ocellar triangle; pregonite needle-like, distiphallus narrow posteriorly; Oriental species ..... *P. godfreyi* (Draber-Mońko, 1964) ♂
- Frons as wide as ocellar triangle; pregonite wide, distiphallus wide posteriorly; Palearctic species ..... *P. hemiptera* (Fabricius 1794) ♂

17. Phallus not haired; abdomen always uniformly thinly grey pruinose except syntergite I+II; male terminalia as Fig. I-17 ..... *P. diversa* (Coquillett, 1897) ♂(in part)  
 - Phallus haired; tergites and terminalia not as above ..... 18
18. Abdominal tergites clearly transversely grey pruinose; fronto-orbital plate yellow pruinose; wing not enlarged ..... *P. subopaca* (Coquillett, 1897) ♂  
 - Abdominal tergites shining, or not pruinose as above; fronto-orbital plate grey or yellow pruinose; wing enlarged or not ..... 19
19. Syncercus deeply notched posteriorly (semicircular); base of pregonite narrow, with sharp point, longer than postgonite; Palaearctic species .. *P. obesa* (Fabricius 1798) ♂  
 - Syncercus relatively shallowly notched posteriorly; base of pregonite broad, not longer than postgonite; New World species ..... 20
20. Distiphallus distally expanded into short, broad bilobed sclerite; ventrolateral process with two inverted spines; wing pictured on basal 1/2 only ..*P. nigrens* (Wulp, 1892) ♂  
 - Distiphallus not strongly expanded at apex; wing varied in colour pattern ..... 21
21. Ventrolateral process of distiphallus straight, not bent; western Nearctic species .....  
 ..... *P. aeneoventris* (Williston, 1886) ♂  
 - Ventrolateral process of distiphallus bent, and hook-like; eastern Nearctic species .....  
 ..... *P. robertsonii* (Townsend, 1891) ♂
22. Sternite VII bent, apex directed ventrally ..... 23  
 - Sternite VII straight, or bent but apex directed dorsally ..... 26
23. Ovipositor bent, apex slightly or strongly directed dorsally ..... 24  
 - Ovipositor bent, apex slightly or strongly directed ventrally .....  
 ..... *P. aurulans* (Meigen, 1824) ♀ / *P. kudoii* Sun, new species ♀
24. Lateral angles of sternite VII bent downward into triangles posteriorly .....  
 ..... *P. japonensis* Sun, new species ♀  
 - Sternite VII not as above ..... 25
25. Legs, at least tibia, yellow or brown; New World species ..*P. piceipes* (Wulp, 1892) ♀  
 - Legs black; Palaearctic species ..... *P. zimini* (Draber-Mońko, 1965) ♀
26. Thorax with dense orange yellow or brown hairs; scutellum yellow or brown .....  
 ..... *P. hemiptera* (Fabricius, 1794) ♀  
 - Thorax with sparse black or yellow hairs; scutellum black ..... 27
27. Posterior margin of sternite VII rounded or linear in ventral view (as in Figs. I-17.6, I-40.6)  
 ..... 28  
 - Posterior margin of sternite VII pointed in ventral view (as in Figs. I-1.6, I-61.6) .. 30
28. Sternite VII short and wide, boat-like ..... *P. diversa* (Coquillett, 1897) ♀  
 - Sternite VII slender, not boat-like ..... 29
29. Apex of sternite VII spoon-like, bent dorsally ....*P. takanoi* (Draber-Mońko, 1965) ♀  
 - Apex of sternite VII abruptly broadened, tubular, straight.. *P. nigrens* (Wulp, 1892) ♀
30. Lower margin of face strongly projecting, visible in profile; 1 katapisternal seta .... 31  
 - Lower margin of face perpendicular, or slightly projecting; 2 katapisternal setae ... 34

31. Abdomen silvery pruinose, always with black longitudinal vitta; abdomen with black transverse vittae posteriorly (at least tergite III); sternite VII thin, triangular, apex pointed ..... *P. subopaca* (Coquillett, 1897) ♀  
 - Abdomen black, shining purple, or grey (or yellowish grey) pruinose; if pruinosity present, black longitudinal vitta and transverse vitta absent or indistinct; Sternite VII tapered ..... 32
32. Distribution Palaearctic ..... *P. obesa* (Fabricius, 1798) ♀  
 - Distribution New World ..... 33
33. Distribution eastern Nearctic ..... *P. robertsonii* (Townsend, 1891) ♀  
 - Distribution western Nearctic and Neotropical .. . *P. aeneoventris* (Williston, 1886) ♀
34. Sternite VII broad and short, as long as or slightly longer than sternite VI (visible part); abdomen with orange yellow area (especially on syntergite I+II, tergite III) ..... *P. aurigera* (Egger, 1860) ♀  
 - Sternite VII distinctly narrow and long; abdomen black or with indistinct dark yellow area. .... 35
35. Ovipositor (segment VIII) much longer than sternite VIII ..... *P. grazynaе* (Draber-Mońko, 1965) ?  
 - Ovipositor (segment VIII) much shorter than sternite VIII ..... 36
36. Gena greyish yellow pruinose; sternite VII bent upward gradually; Nearctic species .. *P. grandis* (Coquillett, 1897) ♀  
 - Gena grey pruinose; sternite VII bent upward abruptly; Palaearctic species..... *P. albopunctata* (Baranov, 1935) ♀

### 3.4.1 *Phasia aeneoventris* (Williston, 1886)

(Figures I-1, II-9.2)

*Hyalomyia aeneoventris* Williston, 1886: 286.

*Hyalomyia umbrifera* Wulp, 1892: 186, **syn. nov.** - Townsend, 1893: 166.

*Hyalomyia umbrosa* Wulp, 1892: 186, **syn. nov.**

*Alophora opaca* Coquillett, 1897: 44, **syn. nov.**

*Alophoropsis alaskensis* Brooks, 1945: 663, **syn. nov.**

*Alophoropsis occidentalis* Brooks, 1945: 664, **syn. nov.**

*Oedematopteryx opaca*: - Brooks 1945: 666 (redescription).

*Alophorella polita* Brooks, 1945: 669, **syn. nov.**

*Alophorella aeneoventris*: - Brooks 1945: 670 (redescription) - Sabrosky and Arnaud 1965: 967 (catalog) - Arnaud 1978: 4, 59 (host catalog) - Clancy and Pierce 1966: 855, 857 (host).

*Alophorella aeneoventris robertsonii*: Brooks 1945: 671 (in part).

*Alophorella alaskensis*: - Sabrosky and Arnaud 1965: 967 (catalog).

*Alophorella occidentalis*: - Sabrosky and Arnaud 1965: 968 (catalog).

*Alophorella opaca*: - Sabrosky and Arnaud 1965: 968 (catalog) - Arnaud 1978: 4, 59 (host catalog).

*Alophorella umbrifera*: - Guimarães 1971: 13 (catalog).

*Hyalomyia umbrosa*: - Guimarães 1971: 13 (catalog).

**DESCRIPTION**

Body length: 4-11 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, yellow or grey pruinose, 4-5 rows of hairs laterally. Frontal vitta black. Frontal vitta at base of antennae 0.9-1.0 times as wide as fronto-orbital plate anteriorly. Dorsal facets of eye larger than ventral facets. Ocellar setae present but fine; outer vertical setae present (fine); inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.2-1.3 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3-2/5. Gena black with grey pruinosity; hairs white; height 0.15-0.18 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.4-0.5. Length of oral opening 1.8-2.0 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow, or brown.

**THORAX.** Mesoscutum thinly pruinose, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1-2 postsutural intra-alar setae; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size; black. 1 katepisternal seta. 5-11 meral setae. Scutellum black with grey pruinosity (thinly), with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline or pictured; if pictured, various colour patterns, narrow or broad; petiole of apical cell 0.25-0.30 times as long as preceding section of  $R_{4+5}$ ;  $M$  meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, without bristles, apically with 0-1  $v$ , 1  $pv$  and 1  $d$ . Fore tarus black. Fore claws brown, apex black; 1.0-1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black, with 1  $ad$ , 0-1  $p$  and 1  $v$ , apically with 1  $ad$ , 0-1  $a$ , 1  $p$ , 1  $pd$ , 1  $v$  and 1  $d$ . Hind femur black, with whitish yellow hairs ventrally and laterally, and black hairs dorsally. Hind tibia black, with 3-5  $ad$  and 4-8  $pd$ .

**ABDOMEN.** Abdominal tergites black; pruinosity usually present (silvery or yellow); longitudinal vitta absent; if pruinosity absent, dorsum of tergites shining, purple. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.05; relative width I+II:III:IV:V = 0.4-0.5:1:1:0.8. Syntergite I+II shiny, not pruinose, or thinly pruinose. Pruinosity of tergite III absent, or present evenly. Pruinosity of tergites IV, V absent, or present (yellow); hair spots distinct. **TERMINALIA.** Syncercus broad, shorter than surstylus, with an indistinct notch posteriorly. Surstylus slender; straight, slightly broadened on apical half, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium almost as long as phallop-



deme. Epiphallus well developed. Pregonite pointed, as long as postgonite. Phallus 1.2-1.3 times as long as hypandrium, with fine white hairs dorsally, both dorsolateral process and ventrolateral process straight, and well sclerotized.

**FEMALE.** Usually smaller than male. Wing always hyaline. Eyes separated by a distance as wide as ocellar triangle; Anterior spine-like setae of hind tibia well developed (2-3 rows). Syntergite I+II shiny, tergites III, IV, V always with grey or yellow pruinosity. Sternite VII (sheath) longer than sternite VI, tapered, pointed apically, not bent; apex straight; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia aeneoventris* Williston, 1886. Lectotype ♂, [USA], W.T. [Washington Territory], (SEMC, examined).

*Hyalomyia umbrifera* Wulp, 1892. Holotype ♂, [MEXICO], Guerrero, 8,000ft, July, H.H. Smith (BMNH, head missing, examined); paratypes, 4?, same as holotype, (BMNH, head all missing, examined).

*Hyalomyia umbrosa* Wulp, 1892. Holotype ♂, [MEXICO], Guerrero, Omilteme, 8,000ft, July, H.H. Smith (BMNH, examined).

*Alophora opaca* Coquillett, 1897. Holotype ♂, [USA], "Eastern Washington", collected by Prof. Piper (USNM, type no. 3519, examined).

*Alophoropsis alaskensis* Brooks, 1945. Holotype ♂, [USA], Alaska, Matanuska, 27.viii.1943 (USNM, examined); allotype ♀, [USA], Alaska, Matanuska, 27.viii.1943, R.T. Blossom (USNM, no. 57268, examined); paratypes 1♂3♀, same data as holotype (USNM, examined);

*Alophoropsis occidentalis* Brooks, 1945. Holotype ♂, [USA], "New Mexico, White Mts., NFK Ruidoso, about 8,200ft, on flowers of *Solidago trinervata*, 8-17, Townsend" (USNM, examined); 4♂1♀ paratypes as follows: 1♂, same data as holotype (USNM, examined); 1♂, [CANADA], Alberta, Lethbridge, 10.vii.1922, H.L. Seamans (CNCI, examined); 1♂, [CANADA], Alberta, Waterton, vii.1923, H.L. Seamans (CNCI, examined); 1♂1♀, [CANADA], British Columbia, Vernon, 20.ix.1918, M.K. Ruhmann (USNM, examined).

*Alophorella polita* Brooks, 1945. Holotype ♂, [USA], New Mexico, NFK Ruidosa, White Mts., about 8,200ft, on flowers of *Solidago trinervata*, 8.17, Townsend (USNM, examined); Allotype ♀, same as holotype (USNM, examined); 14♂12♀?paratypes as follows: 4♂6♀, same as holotype except the data is 8.3-20. (USNM, BMNH, examined); 1♂1♀, [USA], Montana, Gallatin Co., Bozeman, 1.vii.1916 and 1.viii.1917 (CNCI, examined); 1♂1♀, [USA], Idaho, Moscow, J.M. Aldrich (USNM, examined); 1♀, [USA], North Dakota, Minot, vi.18.1918, J.M. Aldrich (USNM, examined); 1♂, [CANADA], Alberta, Lethbridge, vi.18.1926, H.L. Seamans (CNCI, examined); 1♀, [CANADA], Alberta, Slave Lake, viii.15, 1924 (assigned as metatype of *Alophora nitida* Coq. by Curren, CNCI, examined); 1♂, [CANADA], Alberta, Edmonton, 27.vii.1925, O. Bryant (USNM, exam-

ined); 1 ♀, [USA], North Dakota, Minot, 18.vi.1918, J.M. Aldrich (USNM, examined); 1 ♂, [CANADA], British Columbia, 12.viii.1917, M.Ruhmann (CNCI, examined); 1 ♂, [USA], New Mexico, Tahique, 25.vi.1941, E.L. Todd (USNM, examined); 2 ♂, [USA], Colorado, Boulder, Univ. of Colorado, 2.x.1917 (USNM, examined); 1 ♂1 ♀, [USA], Colorado, Boulder, vi.8.1932, M.T. James (CNCI, examined); 1 ♂, [USA], Colorado, Colorado Springs, vii. Townsend (USNM, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Alberta:** Bilby, 22.vi.1924, O. Bryant (1 ♀, CASC); Calgary, 26.vii.1925, O. Bryant (1 ♀, CASC); Edmonton, 17.x.1936, F.O. Morrison (1 ♂, AMNH); Fairview, 12.vii.1982, E. Lippert (1 ♀, DEBU); Kananaskis, For. Exp. Sta. Seebe, 24.vii.1968, H.J. Teskey (1 ♀, CNCI); Lethbridge, 25.vi.-5.vii.1956, E.E. Sterns (1 ♂7 ♀, CNCI); Morinville, 1-29.vi.1983, 20.vi. and 3.viii.1984, G.C.D. Griffiths (3 ♂3 ♀, DEBU); Red Deer River at Hwy. 876 (W. Dinosaur Prov. Pk.), v.28-29.1984, J.E. O'Hara (1 ♀, CNCI); Slave Lake, 14.viii.1924, O. Bryant (2 ♂2 ♀, CASC); Waterton Lakes National Park, 7-12.vii.1980, H.J. Teskey (1 ♂, CNCI); Waterton, 10.vii.1923, H.L. Seamans (1 ♂, CNCI). **British Columbia:** Ft. Nelson, 27.viii.1948, W.R. Mason (3 ♂, CNCI); Gagnon Rd., 6mi W Terrace, 20.vi-9.vii.1960, C.H. Mann, J.G. Chillcott, G.E. Shewell (9 ♂7 ♀, CNCI); Hope (5mi E), 11.vii.1973, H.J. Teskey (1 ♂, CNCI); Lakelse Lake, Bog, nr. Terrace, 27.vi-1.viii. 1960, R. Pilfrey, W.R. Richard and C.H. Mann (3 ♂2 ♀, CNCI); Roffal Oak, 13.ix.1917, W. Downes (assigned as homotype of *Hyalomyia aeneoventris* by D.M. Wood in 1966)(1 ♂, CNCI); Shames, 18mi SW Terrace, 17.vii.1960 (2 ♂1 ♀, CNCI); Shields, 4.ix.1961, H.R. Foxlee (1 ♀, CNCI); Spring Creek, Terrace, 11.vi.1960, B.S. Heming and W.W. Moss (2 ♂, CNCI); Squamish, Diamond Head Trail 4,600ft, 28.viii.1953, W.R.M. Mason (1 ♂, CNCI); Summerland, 15.ix.1930, A.A. Dennys (1 ♀, CNCI); Terrace, 8.vi-25.vii. 1960, W.R. Richards, R. Pilfrey and B. Heming (4 ♂6 ♀, CNCI); Terrace (7mi E), Remo, 13.vi.1960, R. Pilfrey (1 ♀, CNCI); Terrace (32mi SW), 4-6.vi.1960, 5.vii.1960, B. Heming G.E. Shewell (2 ♂1 ♀, CNCI); Terrace on Hwy.25 (25km SW), 7-8.vii.1984, J.E. O'Hara (25 ♂16 ♀, CNCI); Terrace (54mi NE), near Woodcock, 25.vii.1960 (1 ♀, CNCI); Terrace (6mi W), Gagnon Rd., 20.vi-9.vii.1960, J.G. Chillcott, C.H. Mann (2 ♂, CNCI); Trinity Valley, 27.vii.1937, K. Giahham (1 ♂, CNCI); Vernon, 20.x.1918, M.H. Ruhmann (1 ♂, TAMU); Vernon, 9.ix.1927, I.J. Ward (1 ♀, CNCI). **Yukon Territory:** Dempster Hwy, Klondike R. Bridge, 2.viii.1980, Wood and Lafontaine (33 ♂7 ♀, CNCI); Kluane Lake, 1.viii.1963, G. and D.M. Wood (1 ♀, CNCI). **USA: Alaska:** Matanuska, 23.v.-27.ix.1943/44/45, J.C. Chamberlin (23 ♂17 ♀, USNM); Palmer, Montgomery, 1.vii. 1955 (1 ♂1 ♀, USNM); Richard Hwy, 290mi, 19.vi.1951, J.R. McGillis (1 ♂, CNCI). **Arizona:** Catalina Mts., Htchk. Hwy. 19mi., 18.vii.1955, F.G. Werner and G.D. Butler (2 ♂2 ♀, CNCI); Cochise Co., Rustler Park, 8,500ft, Chiricahua Mts., 4.ix.1959, D.D. Linsdale (1 ♂, CASC); Cochise Co., Southwestern Research Station, 24.x.1964, P.H. Arnaud, Jr (1 ♂, CASC); Cochise Co., Chiricahua, 14.iii.1917, V.W. Owen (1 ♀, CASC); Cochise Co., Turkey Ck. Cn., 24.iii.1967, D.M.

Wood (2♂, CNCI); Cochise Co., Chiricahua Mts., 8,000ft, 21.viii.1964, J.G. and B.L. Rozen (1♂, AMNH); Cochise Co., Sierra Vista, 4,590ft., 15-30.v.1966 and 3.iv.1967, R.F. Sternitzky (2♂, CNCI); Cochise Co., 12km S Sierra Vista, Ramsey Cyn., 1,700m, 6.vi.1987, B.V. Brown (1♂6♀, CNCI); Cochise Co., 22.x.1964, P.H. Arnaud Jr.(1♀, CASC); Cochise Co., Southwest Res. Stn., 1-2.vi.1991, J.E. Swann (1♂, DEBU); Cochise Co., Turkey Ck., Cn., 24.iii.1967, D.M. Wood (1♀, CNCI); Phoenix, 8.viii.1917, R.C. Shannon (1♀, CUIC); Cochise Co., 9.iii.1917 (3♂1♀, CASC); Coconino Co., Coconino Nat. For., 2km W.Sunset Crater Nat.Mon., 2,100m, 22-23.viii.1982, J.E. O'Hara (3♂2♀, CNCI, DEBU); Huachuca Mts., Ramsey, 5,000-5,200ft, 22.iii.1956, 11.ii.1967, Sternitzky, G. Butler (12♂5♀, CNCI); Huachuca Mts., Ramsey, 5,700ft, 2. v.1967, D.M. Wood (2♂, CNCI). Graham Co., 2.4 km W on Hwy 666, 1,160m, 27-28.v.1991, malaise trap, J. E. O'Hara (1♀, CNCI); Gila Co., Pinal Mtns., Pinal Peak, 15 mi SW Globe, 7,500ft, 23-24.viii.1993, J.E. O'Hara (2♀5♂, CNCI); Huachuca Mts., Sierra Vista, 1.ix.-1.x.1965, R.F. Sternitzky (1♂, CNCI); Pinal Co., Oracle (7mi S), 28-30.iv.1967, D.M. Wood (1♂1♀, CNCI); Portal, 4.ix.1959, A.L. Melander (1♂, USNM); S Catalina Mts., Mt. Lemon, vii.27.1917, R.C. Shannon (1♂1♀, CUIC). **California:** 7-Oaks, 19.ix.1953, A.L. Melander (1♀, USNM); Alameda, 19.vi.1932, E.P. van Duzee (1♀, CASC); Atascadero, 25.vi.1962, D.W. Clancy (1♀, USNM); Angelus Camp, 22.viii-3.ix.1953, A.L. Melander (2♂4♀, USNM); Claremont, Baker (1♀, USNM); El Dorado Co., Echo Lake, 13.vii.1961, 7,500ft, B.H. Poole (1♀, CNCI); Humboldt Co., Blocksburg, 23.vi.1935, B.P. Bliven (1♂, CASC); Mt., Shasta, 20.vii.1936 (1♀, CASC); Marin Co., Alpine Lake, 1,500ft, D.D. Munroe (1♂, CNCI); Mt. Shasta, McBridge Spr., Cpgd., 5,200ft, 20.vii.1968, D.D. Munroe (1♂, CNCI); Pinehurst, 7.vi.1935, A.L. Melander (1♂, USNM); San Bernardino Co., Mt. Home Can., 15.v.1947, 20-29.ix.1955, A.L. Melander (3♂2♀, USNM); San Bernardino Co., Mill Cr., Cn., 25.ix.1923, F.R. Cole (1♀, CNCI); Sequoia Nat.Park, Giant Forest, 22.viii.1917, R.C. Shannon (1♂, CNIC); Tehama Co., Lassen Nat. For. Lost Creek, 4,500ft, 10.viii.1966, H.G. Real (1♀, CASC); Trinity Co., Varrville, 2,400-2,500ft, 30.v.1934, G.E. Bohart (1♂, CASC); Tuolumne Co., Mather Site, 1970-1971, A.R. Moldenke (1♀, CASC); Up Sta Ana.Riv. 7.vii.1957, A.L. Melander (1♂, USNM); Vacaville, 1.vi.1932, M.A. Cazier (1♂, USNM). **Colorado:** Boulder, 5,500ft, 31.v.-10.vi.1961, C.H. Mann, B.H. Poole (4♂6♀, CNCI); Boulder, Valmont Butte, 5,300ft, 7.vi.1961, W.R.M.Mason (2♀, CNCI); Campus University of Colorado, 21.ix, (1♂, AMNH); Clear Creek Co., Chicago Cr., 8,800ft, 2.viii.1961, C.H. Mann (1♀, CNCI); Electra Lake, 28.vi-1.vii.1919, (1♀, AMNH); Estes Park, 13.vii.1934 and 14.viii.1961, A.L. Melander and B.H. Poole (2♀, USNM, CNCI); Ft. Collins, 27.ix.1889 and 18.x.1940, J. Swink etc. (2♂, CNCI); Glenwood Springs, 22-29.xii.1919, 5,800ft (1♀, AMNH); Gunnison Co., Meanders of East Riv. S Gothic, 9,200ft, 4.vii.1971, D.E. Breadlove (1♀, CASC); Jackson Co., Muddy Pass., 15.viii.1961, B. Poole (2♀, CNCI); Mineral Co., Wolf Creek Pass, 10,850ft, 15.viii.1983, P.H. Arnaud, Jr (1♂1♀, CASC); Mt. Vernon Cn., nr. Golden, 31.vii.1961, 7,200ft, C.H. Mann (1♂, CNCI); Mt. Evans, Doolittle Ranch, 9,800ft, 10.viii.1961, S.M.

Clark (1♀, CNCI); Pingree Park, 17.viii.1934 (1♂, CNCI); Rio Grande, The South Fork, 8,500ft, 17.vi.1919 (1♀, AMNH). **Idaho:** Chatcolet, 15.viii.1961, A.L. Melander (2♂, USNM); Idaho Co., Whitebird summit, 22.vii.1964, R.L. Westcott (1♂, CNCI); Moscow, 1.ix.1908, 31.vii.1910, J.M. Aldrich (1♂2♀, USNM); Waha, 12.viii.1923, A.L. Melander (1♂, USNM). **Montana:** Granite Co., Roadside above Georgetown Lake, 7.viii.1990, J.E. Swann (1♀, DEBU); Missoula, 23.viii.1904, (1♀, USNM). **New Mexico:** Lincoln Co., Bonita lake region, 8.vii.1988, malaise trap, N. Jorgensen (1♀, CNCI); Mora Co., W Ocate, Lefebres Cyn., 7,500ft, 10-11.ix.1993, J.E. O'Hara (1♂, CNCI); Mora Co., Ocate (4 mi W), 22.vi.1988, malaise trap, N. Jorgensen (1♂, CNCI); Otero Co., Penasco River, 8 mi W Mayhill, 15.vi.1988, N. Jorgensen (1♂1♀, CNCI); San Miguel Co., 5 mi W Sapello, 27.v.1976, N. Jorgensen (1♀, CNCI); Socorro Co., Mt. Withington, 25 mi SW Magdalena, 14.vii.1988, malaise trap, N. Jorgensen (1♂, CNCI); Torrance Co., Manzano Mtns, 8 mi W Tajique, 7,500ft, 11-12.viii.1993, J.E. O'Hara (25♂20♀, CNCI); Torrance Co., Red Canyon Camp Ground, 6 mi W manzano, 12.vi.1988, malaise trap, N. Jorgensen (9♂8♀, CNCI); Cloudcroft, 8,500-9,000ft, 6.ix.1963, H.V. Weens, Jr. (3♂, CNCI); Grant Co., Gila Nat. For., 2,250m, 29-31.vii.1982, J.E. and W.M. O'Hara (1♂, DEBU); NFK Ruidosa, White Mts., about 8,200ft, on flower of *Solidago trinervata*, 8.17, Townsend (8♂5♀, USNM, BMNH); Las Cruces, 6.3. Townsend (1♂, BMNH); Hidalgo Co., (11mi N), Rodeo, 1.v.1969, Rozen and Favreau (1♀, AMNH). **Oregon:** Benton Co., Macdonal Forest Oak Cr. 30.vi.1971 (1♀, USNM); Baker Co., Melhorn's Mill Near Halfway, 7-5-23, W.J. Chamberlin (1♀, USNM); Jackson Co., Pinehurst, 3,400ft, 24.vi.1971, G. Steyskal (1♂2♀, USNM); Sutherlin, 15.vi.67, C.W. Sabrosky (1♀, USNM). **South Dakota:** Custer, 15.vii.1924, (1♂, USNM). **Utah:** Duchesne Co., Helper (20km N), 18.vii.1988, W.N. and D. Mathis (1♂, USNM); Hanksville (24mi S), 7,500ft, Henry Mts., 29.vii.1968, J.E.H. Martin (1♀, CNCI). **Washington:** Adams Co., Washtucna, 14.x.1960 (1♂, CNCI); Almota, 1961, A.L. Melander (1♂, USNM); Benton Co., Hanford Site, 5.iv.9.vi.10.x.1994, R.S. Zack (4♂3♀, CNCI); Clallam Co., Forks, 2.vii.1920, E.P. van Duzee (4♂1♀, CAS, TAMU); Mt., Baker Lodge, 436ft, Hwy 542, 24.vii.1968, B.V. Peterson (1♂, CNCI); Orcas Is., North Beach, 19.viii.1925, A.L. Melander (1♀, USNM); Pullman, 11.x.1901, 27.viii.1913 and 16.vi.1912, A.L. Melander (2♂1♀, USNM); Seattle, 19.vi.1920, E.P. van Duzee (1♀, CASC); Spanaway, 2.vii.1933, J. Wiloox (3♂2♀, CNCI); Walla Walla, Klicker Bros., 29.xi.1949 (1♂, USNM); Wawawai, 7.v.1966, C.W. Sabrosky (1♂, USNM); Wenatchee, 2.vi.1915, E.J. Newcomer (2♂, USNM). **MEXICO:** Catemaco, Ver 1,100ft, 16-18.vi.1969, W.R.M. Mason (1♂, CNCI); Durango (11mi W), Dgo, 7,000ft, 23.vi.1964, J.F. McAlpine (1♂, CNCI); Orizaba V. C. 9-16.i.1892, H. Osborn (1♂, USNM).

#### HOST

*Lygus hesperus* Knight (Hemiptera, Miridae): - USA (CA) (Arnaud 1978: 59).

#### NOTES

Morphological variation is extensive in this species. In the male, wing patterns ranges

from hyaline to totally pictured, and wing size range from narrow to broad; tergites vary from shining to totally grey pruinose. Females have much less morphological variation than males.

### 3.4.2 *Phasia albopunctata* (Baranov, 1935)

(Figures I-4, II-11.4)

*Allophora albopunctata* Baranov, 1935: 559.

*Allophora albopunctata*: Takano 1958: 1692,4874.

*Allophora (Brumptallophora) albopunctata*: Draber-Moňko 1965: 85 (redescription).

*Phasia (Phasia) albopunctata*: Herting 1984: 168 (catalog) - Herting and Dely-Draskovits 1993: 409 (catalog).

#### DESCRIPTION

Body length: 7.0-11.0 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, 5-6 rows of hairs laterally. Frontal vitta triangular, reddish brown. At the level of antenna base, frontal vitta 1.5-1.7 times as wide as fronto-orbital plate anteriorly. Dorsal facets of eye slightly larger than ventral facets. Ocellar setae absent, or present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial with lower part yellow, upper part brown to black with grey pruinosity; not haired; 1.9-2.1 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, orange yellow, grey pruinose. Vibrissa not differentiated; intervibrissal distance 0.9 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/2. Gena yellow or brown, grey pruinose; hairs white; height 0.15-0.18 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.33-0.4. Length of oral opening 1.5-1.7 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum thinly pruinose; indistinct black longitudinal vittae, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta absent; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs white and black; and without scale-like setae. Anepimeral setae hair-like, black; 2 katepisternal setae; 9-12 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured; white with light brown infuscation, narrow; petiole of apical cell 0.2-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow, or brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, with 2-3 *p*,

apically with 1 *pv*, 1 *p* and 1 *pd*. Fore tarus black. Fore claws black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black, with 1 *ad* and 3-4 *p*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 0-1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia slightly arched; black, with 3-4 *ad* and 4-5 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity brownish yellow (on whole dorsum); longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.8. Syntergite I+II pruinose. Pruinosity of tergites III, IV and V brownish yellow. Hair spots of tergites IV, V indistinct. **TERMINALIA.** Syncercus long, without notch posteriorly. Surstylus broad apically; arched dorsally; longer than cercus. Ejaculatory apodeme slender. Hypandrium broad, as long as phallapodeme. Pregonite and postgonite pointed. Epiphallus well developed. Phallus short and broad, without fine hairs dorsally; distiphallus branched; dorsolateral process with two pointed branches; ventrolateral process short, with two indistinct blunt branches.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes almost touching. Anterior spine-like setae of hind tibia absent. Abdomen black shining, the junction between tergites and outer side of tergites with thinly grey pruinosity. Sternite VII (sheath) longer than sternite VI; hook-like; sharp apically; bent, apex directed dorsally; smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora albopunctata* Baranov, 1935. Holotype ♀, [JAPAN], Sapporo, Hokkaido, N. Baranov Collection 1960 (USNM, No. 65743, examined); paratype 1♂, JAPAN, Moiwa, Hokkaido, N. Baranov Collection 1960 (USNM, head missing, examined).

#### OTHER MATERIAL EXAMINED

**JAPAN.** Aomori C., Mayadiri, 18.x.1980, Sho Fukushi (1♂, BLKU); Hokkaido, Iwanai-senkyo, 14.x.1991, M. Nishiyama (1♂, BLKU); Honshu, Tochigi, 600m, Shiobara Spa., 25-26.x.1988, H. Kurahashi (5♀, NIHJ). **PAKISTAN.** Ayubia Nat. Park, 2200m, Kashmir, 25-30.vii.1988, S. Shinonaga (1♀, BLKU). **CHINA.** Taiwan, Tsiufeng, 28.v.1972, R. Kano (1♂, BLKU). **DOUBTFUL LOCALITY:** [country]: Kyhamup, 26.vii. 1964, K. Elberg, ex: Mesnil Collection (1♀, CNCI).

#### HOST

Unknown.

#### NOTES

*Phasia albopunctata* (Baranov) is an eastern Palaearctic species. It is mainly distributed in Russia (southern Siberia and Far East), Japan and south to Pakistan and Taiwan (partly from Draber-Moňko 1965: 155 and Herting 1984: 168).

**3.4.3 *Phasia aurigera* (Egger, 1860)**

(Figures I-7, II-11.4)

*Alophora aurigera* Egger, 1860: 796.*Phasia urnifera* von Roser, 1840: 57, *nomen oblitum*.*Alophora bonapartea* Rondani, 1861: 217 - Baer 1921: 128 - Stein 1924: 258 - Rhodendorf 1933: 713.*Alophoa kriebbaumeri* Schiner, 1869b: 841.*Hyalomyia helleri* Palm, 1876: 420.*Alophora (Hyalomyia) bonapartea*: Girscher, 1887: 22 - Bezzi und Stein 1907: 579 - Rohdendorf 1947: 86.*Halophora subcoleoprata* (Linnaeus) of Pandellé, 1894: 88. (misident.).*Allophora aurigera*: Wenfurther 1906: 8-9 - Dupuis 1949: 501.*Brumptalophora aurigera*: Dupuis 1952: 27 - Dupuis 1963: 106 (host).*Alophora (Brumptalophora) aurigera*: Draber-Moňko 1965: 140 (redescription).*Phasia (Phasia) aurigera*: Herting 1984: 168 (catalog) - Herting and Dely-Draskovits 1993: 409 (catalog).**DESCRIPTION**

Body length: 8-13 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate yellow, yellow pruinose, more than 3-4 rows of hairs laterally. Frontal vitta almost parallel, reddish brown. Frontal vitta at base of antennae 0.8-0.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae absent, or present but fine; outer vertical setae absent; inner vertical setae absent. Face yellow or brown, yellow pruinose. Parafacial yellow; grey pruinose, bare, 2.5-3 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, orange yellow, grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.6-0.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 4/5. Gena yellow or brown, grey pruinose; hairs white; height 0.25 times eye height. Lunule black, shining; sublunular bulla indistinct. Antenna black, or pedicel yellow or brown; first flagellomere black, 1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.8 times its width. Occiput flattened, greyish yellow pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum strongly pruinose (yellow); 2 black longitudinal vittae, but ending at posterior half of postsutural dorsum, with fine black hairs. 0+0(1) acrostichal seta; 0+0(1) dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta absent, or present but fine; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron strongly grey pruinose; hairs white and yellow; and without scale-like setae. Anepimeral setae medium size, black; 2 katepisternal seta; 8-11 meral setae. Scutellum black or base black with yellow tip, grey pruinose, with two pairs of marginal setae; apical setae absent; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured; white with light brown infusca-

tion, narrow, or broad; petiole of apical cell 0.20-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow, or brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia brown to black, with 1 *ad* and 1 *p*, apically with 1 *ad*, 1 *pv*, 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; ventrally and laterally with whitish yellow hairs, black hairs dorsally. Mid tibia brown, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur brown; hairs black; scale-like setae absent. Hind tibia yellow, with 3-5 *ad* and 4-5 *pd*.

**ABDOMEN.** Abdominal tergites with yellow spot or area (syntergite I+II, anterior half of tergite III and outer side of tergite V yellow); longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.8. Syntergite I+II pruinose (thinly). Tergite III shiny. Pruinosity of tergite IV absent; hair spots indistinct. Pruinosity of tergite V yellow (V-like); hair spots indistinct. **TERMINALIA.** Syncercus slender, with a small and shallow notch posteriorly. Surstylus longer than cercus, hook-like; strongly arched dorsally. Ejaculatory apodeme slender. Hypandrium broad, shorter than phallapodeme. Postgonite bent ventrally, pointed, longer than pregonite. Pregonite short, with sparse hairs dorsally. Phallus broad, longer than hypandrium, without fine hairs. Distiphallus branched; dorsolateral process with two branches.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes almost touching. Thorax without yellow pruinose area. Anterior spine-like setae of hind tibia absent. Tergite V also shining black. Sternite VII (sheath) longer than sternite VI, hook-like, pointed, bent; apex directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora aurigera* Egger, 1860. Holotype ♂, Austria, Wien, (location unknown, not examined).

#### OTHER MATERIAL EXAMINED

**AUSTRIA.** Manhartsberg, Nied. Österr. Siebeck (2♂3♀, DEIC). **CHINA.** Beijing, Qinglongqiao, Sanbu and Baidalin, 19.x.1979, 29.x.1979, 30.v.1980, 8.x.1980, E. Liang (3♂2♀, IZAS); Jilin, Jinyuan, 12.vi.1982, Z. Mao (1♂, IZAS); Sichuan, Yanyuan, 2,200m, 16.ix.1986, Y. Wang (1♀, IZAS). **CROATIA.** Sejeme, 27.ix.1929 and 30.v.1930, N. Baranov Collection 1960 (2♀, USNM); Sljeme, 23.vi.1931, N. Baranov Collection (2♂, USNM). **FRANCE.** Belfort, Purch E. Le Moul, B.M. 1933-189 (4♂, BMNH); Bozel, 27.5.1901, coll. Lichtwardt (1♀, DEIC); Richelieu, 27.ix.1963, on Flower of *Senecio jacobaea*, (1♂1♀, USNM). **GERMANY.** Berlin, F.C. Schirmer (1♀, DEIC); [?], Brit-M. 1927-184, (8♂7♀, BMNH); Häfnerhaslach, 31.viii and 10.ix.1989, Tschorsnig" (2♂2♀, DEBU);



Helfta Bei Eisleben, 18.ix.1938, H. Köller (2♂1♀, DEIC); Wiesbaden, coll. Oldenberg (6♂4♀, DEIC); Bamberg, Oberhaid, 8.ix.1934, Schneld (1♂, CNCI); Siebengebirg, Hober-Honnel-Lüwenburg, 8.ix.1950 (1♂, CNCI); Darmstadt, coll. Meyer, Reinhard Collection (1♂, CNCI). **ITALY.** Hontebello, 3.x.1965, (1♂, CNCI). **POLAND.** Nimptsch, 7.ix.-10.ix. (1909), Duda, collection, Lichtwardt (5♂6♀, DEIC); **DOUBTFUL LOCALITIES:** "Glatigny, 16.ix.1933, 16.ix.1934, 4.x.1934, (1♂2♀, CNCI)"; "Reuelbeau, 18.vi.1942, (1♂, CNCI)"; "Batzenhofen, 18.ix.1938 (1♀, CNCI)"; "Dreoben, O. Kieferwi (2♂, ZMHU)"; "ex. Girschner Collection, C.J. Wainwright (50♂12♀, BMNH)"; "Europe (label data unreadable), (20♂10♀, DEIC, BMNH, CNCI)"

## HOSTS

*Palomena prasina* (L.) (Hemiptera, Pentatomidae): - (Michalk 1938a: 259, 1938b: 57 - Dupuis 1947: 302, 1948: 206, 1963: 106 - Draber-Mońko 1965: 145).

*Rhaphigaster nebulosa* (Poda) (Hemiptera, Pentatomidae): - (Dupuis 1949a: 215, 1949b: 504, 1963: 106 - Draber-Mońko 1965: 145).

*Coreus marginatus* (L.) (Hemiptera, Coreidae): - (Dupuis 1954: 332, 1963: 106 - Draber-Mońko 1965: 145).

*Gonocerus juniperi* (H.S.) (Hemiptera, Coreidae): - (Dupuis 1954: 332, 1963: 106 - Draber-Mońko 1965: 145).

*Gonocerus acuteangulatus* (Goeze) (Hemiptera, Coreidae): - (Dupuis 1963: 106 - Draber-Mońko 1965: 145).

## NOTES

*Phasia aurigera* (Egger) is a Palaearctic species, known from the warmer parts of Europe, including southern France, southern Germany, southern Poland, and Russian Far East (Draber-Mońko 1965: 146 and Herting 1984: 168). This species has 2 generations a year. The adults emerge May-June and September-October in Europe.

### 3.4.4 *Phasia aurulans* Meigen, 1824

(Figures I-8, II-11.1)

*Phasia aurulans* Meigen, 1824: 197.

*Alophora (Hyalomyia) aurulans*: Girschner, 1887: 18 - Brauer et Bergenstamm, 1889: 149 - Bezzi et Stein 1907: 579 - Rohdendorf 1947: 86.

*Alophora splendida* Coquillett, 1902: 105, **syn. nov.**

*Alophora aurulans*: Stein 1924: 258 - Rohdendorf 1933: 712.

*Phasiomyia meliceris* Reinhard, 1955: 234, **syn. nov.**

*Allophorella aurulans*: Dupuis 1963: 106.

*Alophora (Allophorella) aurulans*: Draber-Mońko 1965: 167 (redescription).

*Phasiomyia splendida*: Sabrosky and Arnaud 1965: 970 (catalog) - Brooks 1945: 655 (redescription).

*Phasia (Phasia) aurulans*: Herting 1984: 168 (catalog) - Herting and Dely-Draskovits 1993: 410

(catalog).

*Phasia splendida*: O'Hara and Wood 1998: 765 (new combination).

## DESCRIPTION

Body length: 7-9 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, greyish yellow pruinose, 5-6 rows of hairs laterally. Frontal vitta parallel, black. Frontal vitta at base of antennae 0.6-0.7 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present (but fine); inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.3-1.4 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, grey pruinose. Vibrissa well differentiated; intervibrissal distance as long as distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena yellow or brown, grey pruinose; hairs white; height 0.2-0.25 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1-1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.6-1.7 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow or brown.

**THORAX.** Postsutural dorsum with a big yellow pruinose spot, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs white and yellow; and without scale-like setae. Anepimeral setae medium size, black; 1 katepisternal seta; 5-8 meral setae. Scutellum black with grey pruinosity (thinly), with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured; petiole of apical cell 0.21-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, without bristles, apically with 0-1 *p* and 1 *d*. Fore tarus black. Fore claws black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli black. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black, with 1 *v*, apically with 1 *a*, 1 *p* and 1 *v*. Hind femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs; scale-like setae absent. Hind tibia black, with one row of *ad* and one row of *pd*.

**ABDOMEN.** Abdominal tergites black or with yellow spot or area (various patterns); longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.3; relative width I+II:III:IV:V = 0.4:1:1:0.6. Syntergite I+II and tergite III shining, not pruinose. Pruinosity of tergite IV absent; hair spots indistinct. Pruinosity of tergite V yellow (V-like); hair spots indistinct. **TERMINALIA.** Syncercus long, posterior notch half-circular, with a pair of long hook-like structure posteriorly. Surstylus straight, slightly broad

apically, longer than cercus. Ejaculatory apodeme knob-like, with a small hook apically. Hypandrium broad, as long as phallapodeme. Epiphallus well developed. Pregonite broad. Postgonite long and pointed, extremely longer than pregonite. Ventral of postgonite and dorsal of pregonite with sparse hairs. Phallus broad, 1.3-1.4 times as long as hypandrium, with fine hairs dorsally. Ventrolateral process long, hook-like; dorsolateral process short, straight.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes separated by a distance as wide as ocellar triangle. Thorax without yellow pruinosity. Anterior spine-like setae of hind tibia absent. Abdomen black, shining, without yellow pruinosity. Length of sternite VI less than width. Sternite VII (sheath) longer than sternite VI; broadly flattened; broadened apically; bent, apex directed ventrally; sternite VII with linear wrinkles ventrally (apical 1/2); median area membranous. Ovipositor bent downward.

#### TYPE MATERIAL

*Phasia aurulans* Meigen, 1824. Holotype ♂, AUSTRIA (location unknown, not examined).

*Alophora splendida* Coquillett, 1902. Holotype ♂, [USA], New Hampshire, Franconia (USNM, No. 6201, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Alberta:** Slave Lake, 1-17.viii.1924, O. Bryant (39♂10♀, CNCI, USNM, DEBU, CAS, AMNH, BMNH); Sueffield, 4.viii.1944, G.E. Bohart (1♀, CASC). **British Columbia:** Cultus Lake, 3.vii.1948, H.R. Foxlee (1♂, CNCI); Ft. Nelson, 27.viii. 1948, W.R. Mason (1♂2♀, CNCI); North Shore Shuswap Lake, 400m, 23-31.1987, J.E. O'Hara (3♂2♀, CNCI); Robson, 30.viii.1949, H.R. Foxlee (1♂, CNCI); Squamish Diamond Head Trail 3,200ft, 31.viii.1953, G.J. Spencer (1♂, CNCI); Terrace, 3mi S. Lakelse Rd., 19.viii.1960, C.H. Mann (5♂2♀, CNCI); Terrace, 10-14.viii.1960, B. Heming and W.R. Richards (6♂5♀, CNCI); Terrace (18mi SW), 17.vii.1960, B. Heming (1♀, CNCI); Terrace (6mi W), Gagon Rd., 20.vi.1960, J.G. Chillcott (1♂, CNCI); Terrace on Hwy (25km SW). 25, 7-8.vii.1984, J.E. O'Hara (3♂3♀, CNCI); Woodbury Creek., 3mi N. Ainsworth, Hot Springs, 4,000ft, 1-3.viii.1980, S.A. Marshall (2♀, DEBU). **New Brunswick:** Douglas, 7.viii.1913 and 8.viii.1919, A.B. Baird and J.D. Tothile (2♂, CNCI); Frederickton, 3.x.1933 (1♀, CNCI); Saint John, 6.viii.1900, (1♂, USNM). **Northwest Territories:** Norman Wells, 16.viii.1969, G.E. Shewell (1♂, CNCI). **Nova Scotia:** Cape Split, 27.viii.1989, S.A. Marshall, (1♂, DEBU). **Ontario:** Algonquin Pk. 15.viii.1904, 17.vii.1955 and 19.viii.1993, C.D. Jones P. Hahn and B.V. Peterson (2♂1♀, CNCI, DEBU); Bear Island, Lake Temagami, 19.ix.1946, (1♀, AMNH); Black Sturgeon Lake, 11.ix.1963 (1♂, CNCI); Caudry Township Witchdoctor Lake, 29.viii.1992, J.E. Swann (1♂3♀, DEBU); Frater, 28.viii.1924, E.B. Watson (3♂1♀, CNCI); Haliburton, Lazure Lake, 23.vi.1993, W. Bennett (1♀, DEBU); Hilk, 12.vii.1978, M. Lichtenberg (1♀, DEBU), Lake Nipigon, Grand

Bay, 23.viii.1921, (1♂, USNM); Lake Superior Pk., 8.viii.1972, B.D. Beam (1♂, CNCI); Lake Abitibi, Low Bush., 15.viii.1925, N.K. Bigelow (1♂1♀, TAMU); Ogoki, 4.viii.1952, J.B. Wallis (1♀, CNCI); Sault Ste. Marie, 2.viii.1982, L.D. Coote (1♀, DEBU). **Quebec:** Forestville, 11.viii.1950, R.D. Ruelle (1♂, CNCI); Gatineau Co., Masham Twp., 1.viii.1983, D.M. Wood (20♂23♀, CNCI); Lac Larouche, La Verendrye Pk. 21 and 30.vii.1972, D.M. Wood (31♂12♀, CNCI); Val d'Espoir, 27.viii.1931, J. Ouellet (1♀, AMNH); [?] , 1.x.1977, C.W. Berg (1♂, CNCI). **USA: Connecticut:** Boileau, R.I.F. 24.viii.1940 (2♂1♀, CNCI). **Georgia:** Brasstown Bald, 4,800ft, 19.viii.1957, J.G. Chillcott (1♂, CNCI); **Massachusetts:** Mt. Greylack, 21.vii.1941, F.S. Blanton, (2♂, CUIC). **Maine:** Baxter St. Park, 26.viii.1951, (1♂, CUIC), Camp Kennedy, Mt. Katahdin, 3,000ft, viii.1902, (1♂1♀, USNM); Calais, (?) 3.iv.1903, (2♂, AMNH); Chamberlain Lake, 7.ix.1907, C.W. Johnson (2♂1♀, USNM, CASC), Oxford Co., Grafton Notch State Pk., 22.vii. 1984, N.E. Woodley (5♂1♀, USNM); Penobscot Co., 2.viii.1910 (1♀, CASC). **Michigan:** Agr. Coll. 12.x.1923, L.Q. Gentner (1♂, CNCI); Isle Royale, 3-7.viii.1936 and 6.viii.1957, C.W. Sabrosky and R.W. Hodges (6♂9♀, USNM, CNCI, TAMU, BMNH). **New Hampshire:** Base Mt. Washington., 2,600ft, 31.viii-1.ix.1914, C.H.T. Townsend (50♂22♀, USNM, BMNH); Benton, 6.vii.1931, A.L. Melander (1♀, USNM); Crawford Notch, State Park on Spiraea, 27.vii.1990, S.A. Marshall (3♂2♀, DEBU); Crawford's, A.T. Slosson (2♂1♀, AMNH); Crawlord, Mt. Willard, 16.ix.1909, (1♂, AMNH); Grafton Co., Livermore, East Pond, vii.23/24.1980, J.F. Burger, ex: *Soldago* sp. (5♂5♀, BMNH); Franconia, A.T. Slosson (2♂1♀, AMNH); Franconia Notch, 8.vii.1931, J.M. Aldrich, (1♂1♀, USNM); Noxon Camp, 2,000ft, 5.vii.1931, (1♂, USNM); Kinsman Notch, 7.vii.1931, J.M. Aldrich (2♂2♀, USNM), Randolph, 5.ix.1941, E.L. Bell (1♂, AMNH), White Mts., Nat. For. 4mi W North Woodstock, 2.viii.1980, A.E. Stubbs (8♂3♀, BMNH). **New York:** (?), 29.vii.1920 (1♂, CNCI); North River, 6-16.viii.1950, C.W. Sabrosky, (1♂4♀, USNM). **North Carolina:** Forner Ridge, Smokies, 18.vii.1941, A.L. Melander (3♂, USNM); Great Smoky Mountain National Park, Klingmans Dome, 14.viii.1947, Bullock-Dreisbach (2♂, CNCI); Great Smoky Mountain National Park, 5,500ft, 18.vii.1953, E.S. Ross (1♀, CASC); Great Smokies, Siler's Bald, 5,000ft, 21.viii.1935, H.A. Allard (1♀, USNM); Macon Co., Wayah Bald, 5,336ft, 27.vii.1952, H.Dodge and N. Good (3♂2♀, CNCI); Mt. Mitchell, 20-22.viii.1926, R.W. Leiby (1♀, USNM), Summit of Graggy Mts., 10.viii.1906, W. Reutenmuller (6♂6♀, AMNH). **Oregon:** Brookings (5mi E.), 30.vi.1967, K. Goeden (1♂, USNM); Clatsop Co., 12.ix.1983, R.L. and D.R. Westcott (3♂2♀, USNM); Pittston, MG., 3.viii.1930, A.L. Melander (1♂, USNM); Tillamook Co., Oswald West, S.P. 13.ix.1983, R.L. and D.R. Westcott (1♂, USNM). **Pennsylvania:** K. Comns, 28-29.viii.1931, W.A. Reeks (5♂2♀, AMNH, CNCI). **South Carolina:** Pickens Co., Sassafras Mtn., 31.vii.1978, host: *Elasmucha lateralis* On *Betula lenta*, W.A. Jones, (1♀, USNM). **Tennessee:** G.S.M.N.P., New Found Gap, 14-viii.1947, Bullock-Breisbach (3♂, CNCI, TAMU); Gr. Smoky Mts., Mt. Le Conte, 1.viii.1941, 1.ix.1933 and 23.vii.1957, J.G. Chillcott, R.C. Shannon at al (5♂2♀, USNM, CNCI); Hattiesburg, 2.ix.1944 (1♂,

CASC); (?), 1.ix.1933 (1♂1♀, CNCI). **Vermont:** Peru, 15.vii.1951, A.L. Melander (47♂22♀, USNM); Lyndon, 22.viii.1900, (1♂2♀, USNM). **Virginia:** Shenandoah Natl. Pk., (3♀, BMNH, USNM). **Washington:** Olympic Park, Hurricane Ridge, 21.vii.1968, B.V. Peterson (1♂2♀, CNCI); Quniault, 3.x.1933. (1♀, CNCI); Seattle, 29.vi.1901, J.A. Aldrich (1♂, USNM). **West Virginia:** Cranberry Gls., 10.viii.1952, H.V. Weems, Jr., (4♂2♀, USNM); Davis, Blackwater Falls St. Pk., 2.vii.1986, B.J. Sinclair (2♀, DEBU); Pendleton Co., 1,455m, 28-30.1985, W. Steiner and D. Bogar (1♂, USNM). **Doubtful States:** "White Mts [New Hampshire or Arizona ?], (1♂1♀, USNM)"; "Boyer. ove. 18.x.1936, J.C.D. (1♂, AMNH)"; "Adirondacks Avalanche Trl., 30.vii.1929, A.L. Melander (1♂,USNM)"; "Gasp, K. Cornus, 26.viii.1934, W.A. Reeks (1♂, AMNH)". **CROATIA.** Zagreb, 28.VIII.1934 (1♂, USNM). **JAPAN.** Hokkaido, Iwanai-senkyo, 14.x.1991, M. Nishiyama (1♂, BLKU); Hokkaido, Mt. Onnebetsu, 1-3.viii.1984, M. Iwasa (1♀, BLKU). **FRANCE.** Enfust, 16.viii.1886, ex: Girschner Collection and C.J. Wainwright Collection (2♂, BMNH). **GERMANY.** Tessin, Sigirino, 21.x.1963 (2♂4♀, CNCI, DEBU); Stuttgart (1♂, CNCI); Thal bei Wutha Krs. Eisenach, viii.1894 (1♂, DEIC); Schwarzburg Krs. Rudolstadt, viii.1897 (1♀, DEIC); Bad Blankenburg, viii.1897 (1♀, DEIC). **DOUBTFUL LOCALITIES:** "jauuüs (1♂1♀, BMNH)".

## HOST

*Elasmucha lateralis* (Say) (Pentatomidae: Acathosomatine): - USA (SC) (new record).

## NOTES

*Phasia aurulans* Meigen is a Holarctic species. In the Nearctic region, it is distributed from coast to coast. In the Palaearctic region, it is distributed in Europe northward to Belgium, middle Sweden and St. Petersburg; northern Kazakhstan, southern Siberia, Russian Far East and Japan (Herting 1984: 168).

As detailed by Draber-Mońko (1965: 170-171), *Phasia aurulans* is highly variable with regard to several morphological characters. Abdominal colour patterns and wing pigmentation (males) exhibit a particularly wide range in this species.

### 3.4.5 *Phasia diversa* (Coquillett, 1897)

(Figures I-17, II-10.1)

*Alophora diversa* Coquillett, 1897: 45.

*Alophorella divisa*: error, Johnson 1925: 184.

*Euphorantha diversa*: Brooks 1945: 667 (redescription).

*Alophorella diversa*: Sabrosky and Arnaud 1965: 968 (catalog).

## DESCRIPTION

Body length: 7-12 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity, 4-5 rows of hairs laterally. Frontal vitta black. Frontal vitta at base of antennae 0.9-1.0 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial brown to black with grey pruinosity, bare, 2.0 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.1-1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower than 1/5. Gena black with grey pruinosity; hairs white; height 0.14 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2-1.3 times as long as pedicel; arista thickened on basal 0.2-0.25. Length of oral opening 2.2-2.3 times its width. Occiput flattened, white pruinose; hairs white or black. Palpus yellow or brown.

**THORAX.** Mesoscutum thinly pruinose, without longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 0 postsutural intra-alar setae; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1(2) katapisternal setae; 6-8 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured; petiole of apical cell 0.30-0.38 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 1 *p*, apically with 1 *p* and 1 *d*. Fore tarsus black. Fore claws black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 2 *p* and 1 *v*, apically with 1 *ad*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with a row of *ad*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin (grey); longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 1.2:1.8:1.7:1.5. Syntergite I+II pruinose. Tergite III shiny. Pruinosity of tergites IV, V absent or present (thin grey pruinosity only); hair spots indistinct. **TERMINALIA.** Syncercus with a small notch posteriorly; apex with a hook ventrally. Surstylus slender, slightly broadened and arched dorsally on apical half; longer than cercus. Ejaculatory apodeme knob-like, with a small hook apically. Phallopodeme not longer than hypandrial apodeme. Epiphallus well developed. Postgonite broad apically, longer than pregonite, with sparse hairs ventrally. Pregonite short, with 2-3 teeth. Phallus slender, 1.4-1.5 times as long as hypandrium, without hairs dorsally. Dorsolateral process well sclerotized; ventrolateral process broad, partly sclerotized.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes separated by a distance as wide as single ocellus, or almost touching. Anterior spine-like setae of hind

tibia absent. Sternite VII (sheath) longer than sternite VI, boat-like, broad apically, not bent; apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora diversa* Coquillett, 1897. Holotype ♂, [USA], Massachusetts, Beverly, 11.x.1870, E. Burgess, (USNM, type no. 3521, examined).

#### OTHER MATERIAL EXAMINED

**Canada. Nova Scotia:** Cape Breton Highlands National Park, French Lake Bog, 15.vii.1983, G. and D.M. Wood (1♂, CNCI). **Ontario:** Apple Hill, 4.x. 1933, G.H. Hammond (1♂1♀, CNCI); Bells Corners, 18.ix.1949, G.S. Walley (1♂, CNCI); Cambridge, 12.ix.1993, C.D. Jones (1♀, DEBU); Carleton Co., Richmond (5-8 mi S), 19-25.ix.1978 and 26-30.ix.1983, G. and M. Wood and Cooper and Wood (3♂6♀, CNCI); Carleton Co., Dunrobin, 26.ix.1986, D.M. Wood (25♂5♀, CNCI); Guelph, 17.ix.1992, D.G. Bennett (1♂, DEBU); Jordan, 20.ix.1919, W.A. Ross (2♂, CNCI); Lanark Co., N.Burgess Twp., 28.ix.1969, D.M. Wood (1♂, CNCI); Leeds Co., Chaffeys Lock, 3.ix.1971, P. Ward (1♂, CNCI); Metcalfe, ix.1986 and 13.ix.1993, B.E. Cooper (2♂2♀, CNCI). Metcalfe, 1.ix.-20.x. 1982-86, B.E. Cooper (19♂8♀, CNCI); Orangeville, 29.viii.1993, S.A. Marshall (1♂, DEBU); Ottawa, 26.viii.1894, 24.ix.1961 and 3.x.1964, Hull and J.R. Vockeroth (1♂2♀, USNM, CNCI); Stittsville, 21.ix.1963, W.R.M. Mason (2♂, CNCI). **Quebec:** Abbotsford, 1934 and 20.ix.1935, G.E. Shewell and C.E. Boargault (3♂3♀, CNCI); Aylmer, 5.x.1924 and 28.ix.1924, C.H. Curran (2♀, CNCI); Eardley (4mi N), 25.viii.1971, D.M. Wood (1♂, CNCI); Hull, 25.ix.1923, C.H. Curran (1♂, CNCI); La Trappe, 19.ix.1935, J. Ouellet (2♀, AMNH); Old Chelsea, 8.x.1962, J.R. Vockeroth (1♂, CNCI); Wakefield, 1.x.1960, J.R. Vockeroth (1♂, CNCI); [?], 30.ix.1909, W.R. Thompson (1♂, CNCI). **USA. Delaware:** Water Gap, A.T. Solsson (2♂, AMNH). **District of Columbia:** Georgetown, 4.x. and 14.x.1926, N.K. Bigelow and J.M. Aldrich (1♂2♀, CNCI, USNM). **Georgia:** Stone Mt., 17.xi.1929, P.W. Fattig (1♂, USNM); "Experiment, 24.iii.1939, at flower, lot no.40-24122" (1♂, USNM). **Indiana:** Lafayette, 9.x.1918, J.M. Aldrich (1♀, USNM). **Kentucky:** Bell Co., 28.v.1965, J.G. Chillcott (1♀, CNCI). **Maryland:** Grove Hill, 28-31.x.1916, Flowers of Aster, C.H.T. Townsend (8♂3♀, USNM, CNCI, BMNH); "Clen Echoi, 22.x.1926, N.K. Bigelow" (8♂, CNCI, AMNH). **Maine:** Orono, 5.x.1913, H.M. Parshley (1♀, CASC). **Massachusetts:** Beverly, (1♂, USNM); [no more data], 26.v.1910 (1♂, CNCI). **Mississippi:** Agr. Col., 6-8.iv.1922, H.W. Allen and F.M. Hull (12♂1♀, USNM, CNCI, TAMU); A. and M. Col., 30.iii.1925, H.W. Allen (1♀, USNM); Lafayette Co., v-vi.1960 and vi.1934, F.M. Hull (7♂1♀, CNCI); Oxford, vi.1941, v.1943 and 1-15.ix.1947, F.M. Hull (5♂2♀, AMNH, CNCI); [?], 21.26.iv.1924, H.W. Allen (2♂, USNM) (note: 1♂, on flower of *Chaerophylnorn tainturieri*). **New Jersey:** Taunton, 1-3.x.1926, H.C. Hallock and H.W. Allen (6♂, USNM, CNUC). **New York:** Danby, 24.ix.1964, L.L. Pechuman (1♀, CUIC); Ithaca, 23.ix.1951, J.C. Martin (1♀, CNCI); Nyack, 2.vii.1883 (1♂, AMNH);

Oswego, 4.x.1895 (1♂, USNM); Pine Island, 20.ix.1914 (1♂, AMNH). **North Carolina:** Jackson Co., 2,900ft, 17.iv.1964, (1♂3♀, CNCI); Waynesville (4 mi W), 19.iv.1964, (1♂, CNCI); **Ohio:** ix.1951, reared from *Euschistus servus euschistoides* (Voll.), by G. Kelly (1♂, USNM). **Pennsylvania:** Beaver Co., Rt. 168, 6mi SW of Darlington, 17.ix.1972, M.A. Carter(2♂, CASC); Conewago, 9.x.1909, (1♂2♀, USNM); Harrisburg, 21.ix.1913 (1♂, USNM); Hazleton, 28.ix.1909, Dietz (1♂, USNM); Lehigh Gap, 4.x.1903 (1♀, USNM). **Texas:** Blanco Co. (NW), Davis Ranch, 23.iv. 1959 J.F. McAlpine (1♂, CNCI); College Station, 4-5.xi.1921, 21.x.1917, 3.xi.1930 and 29.x.1933, H.J. Reinhard (9♂18♀, CNUC, USNM, TAMU, CNCI); Fredericksburg, 18.iv.1959, J.F. McAlpine (1♂, CNCI). **Vermont:** Stowe, 17.ix.1933, E.L. Bell (1♀, AMNH). **Virginia:** 4 miles Run, 11.x.1930, Bridwell (1♂1♀, USNM); Great Falls, 26.ix.1915, 23.x.1920 and 18.x.1938, J.M. Aldrich and C.T. Greene (1♂2♀, USNM). **Washington:** Puyallup, 27.ix.1937 and (?), W.W. Baker at al. (2♂, USNM). **Wisconsin,** Madison, 24.ix.1931, (1♂, AMNH). **Misc locality:** " (1♂, USNM)".

#### HOST

*Euschistus servus euschistoides* (Vollenhoven) (Hemiptera, Pentatomidae): - USA (OH) (new record).

#### 3.4.6 *Phasia godfreyi* (Draber-Moňko, 1964), comb. nov.

(see Draber-Moňko 1964a: 120 [figs. 1-10])

*Alophora godfreyi* Draber-Moňko, 1964a: 121; - Crosskey 1976: 166.

#### DESCRIPTION

Body length: 13 mm.

**MALE: HEAD.** Head compressed anteriorly. Vertex 0.15 times as wide as head width; eyes separated by a distance wider than or as wide as ocellar triangle. Fronto-orbital plate yellow, yellow pruinose, 10-13 rows of hairs laterally (reaching to eyes). Frontal vitta parallel, orange red. Frontal vitta at base of antennae 0.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face yellow, yellow pruinose. Parafacial yellow, yellow pruinose, bare, 4.5-5.0 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting; orange yellow, yellow pruinose. Vibrissa well differentiated; intervibrissal distance 0.75 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena yellow, yellow pruinose; hairs white; height 0.13 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna pedicel yellow or brown, first flagellomere black; first flagellomere 1.6 times as long as pedicel; arista thickened on basal 0.33. Length of oral opening 1.6 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow.



**THORAX.** Mesoscutum pruinose; 4 black longitudinal vittae, median two vittae merged on postsutural area, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron grey and yellow pruinose; hairs white and yellow. Anepimeral setae hair-like, white and yellow; 0 katepisternal seta; 11-13 meral setae (yellow). Scutellum yellow and brown, grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured, broad; petiole of apical cell 0.18-2.0 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur yellow, with white or yellow hairs. Fore tibia brown, with 3 *a*, apically with 1 *d*. Fore tarus slightly flattened, brown. Fore claws yellow. Pulvilli yellow. Mid femur yellow, with whitish yellow hairs. Mid tibia brown to black, with 2 *a*, 1 *v* and 3 *p*, apically with 1 *v*. Hind femur yellow, with whitish yellow hairs; scale-like setae absent. Hind tibia slightly arched, brown, with one row of *ad*.

**ABDOMEN.** Abdominal tergites with yellow spot or area; pruinosity present, but thin; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:0.9; relative width I+II:III:IV:V = 0.35:1:1:0.7. Hair spots of tergites IV, V indistinct. **TERMINALIA.** Syncercus broad, with a wide and shallow notch posteriorly. Surstylus straight downward, longer than cercus. Hypandrium shorter than phallapodeme. Epiphallus indistinct. Postgonite triangular, slightly shorter than pregonite, pointed. Phallus 1.3-1.4 times as long as hypandrium, with dense fine hairs dorsally. Distiphallus partly sclerotized.

**FEMALE.** Unknown.

#### TYPE MATERIAL

*Alophora godfreyi* Draber-Moňko, 1964. Holotype ♂, LAOS, Ban Hat Sao, J.F. Godfrey, 1920-244 (BMNH, examined).

#### HOST

Unknown.

#### NOTES

*Phasia godfreyi* was described by Draber-Moňko in 1964 based a single male specimen. No other specimen has been found. The holotype is in poor condition, antennae, right fore leg missing, both wings and abdominal segment V broken, and genitalia kept on a separate slide. Draber-Moňko's description and figures are, however, very detailed. *Phasia godfreyi* is similar to *Phasia hemiptera*, but it can be separated from the latter by the distribution of setae, the width of the frons, the pruinosity of the mesonotum, the colour of the

pleurae and legs, the structure of terminalia. Draber-Moňko hypothesized "it is probable that *A. hemiptera* (Fab.) (= *Phasia hemiptera*) does not transcend the boundary of Palaearctic, the species from Laos being thus geographically isolated from it".

### 3.4.7 *Phasia grandis* (Coquillett, 1897)

(Figures I-22, II-10.2)

*Allophora grandis* Coquillett, 1897: 45.

*Paraphoranthia grandis*: Brooks 1945: 659 (redescription) - Sabrosky and Arnaud 1965: 969 (catalog).

*Phasia grandis*: O'Hara and Wood 1998: 765.

#### DESCRIPTION

Body length: 8-12 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes almost touching. Fronto-orbital plate black with grey pruinosity; more than 3-4 rows of hairs laterally. Frontal vitta brown. Frontal vitta at base of antennae 1.3-1.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial brown, yellow pruinose, bare, 1.4-1.6 times as wide as first flagellomere. Lower margin of face perpendicular, slightly projecting, orange yellow, yellow pruinose. Vibrissa well differentiated; intervibrissal distance 0.9-1.0 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown, yellow pruinose; hairs white; height 0.15 times eye height. Lunule brown black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2-1.3 times as long as pedicel; arista thickened on basal 0.2-0.25. Length of oral opening 2.1-2.3 times its width. Occiput flattened; white pruinose; hairs white. Palpus yellow or brown.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae hair-like, black; 2 katapisternal setae; 8-15 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured; petiole of apical cell 0.13-0.15 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow or brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli brown to black. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with one row of *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites black; thinly pruinose; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.1; relative width I+II:III:IV:V = 0.5:1:1:0.7. Hair spots indistinct. **TERMINALIA.** Syncercus "H-like", with a wide and deep notch posteriorly. Surstylus slender, apex swollen, arched ventrally, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallopodeme. Epiphallus well developed. Postgonite pointed, much longer than pregonite. Pregonite short, sparse hairs dorsally. Phallus 1.2-1.3 times as long as hypandrium, without fine hair dorsally, but with a small thorn closed to distiphallus. Distiphallus bell-like.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia well developed (3-4 rows). Sternite VII (sheath) long, 1.8-2.0 times longer than sternite VI, sharp apically, slightly bent; apex directed dorsally, smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora grandis* Coquillett, 1897. Holotype ♀, [USA], Texas, Lufkin, 17.x.1894, Coquillett Collection (USNM, No. 3542, examined).

#### OTHER MATERIAL EXAMINED

**USA. Alabama:** Montgomery, 15.xi.1946, H.R. Dodge (1♂, USNM). **Arizona:** Greelee Co., Hwy 78, 5km W. of N Mexico border, 14.viii.1983, J.E. O'Hara (1♂, CNCI). **California:** Apple Valley, 9.v. 1955, J.E.H. Martin, (1♀, CNCI). **Georgia:** Stone Mt., 17.xi.1929, P.W. Fattig, (1♂, USNM); **Illinois:** South Illinois, Robertson, (1♀, USNM). **Iowa:** Durant, 2.vi.1905, F.C. Bishopp (1♀, USNM). **Mississippi:** Lafayette Co., (Spring).vi.1943, F.M. Hull (2♀, CNCI); Agr. Col., 28.iii.1918, 24.iii.1922, 6.iv.1922, F.M. Hull, F.H. Jones (2♂3♀, USNM, CNCI, TAMU); A and M Col., 30.iii. 1925, H.W. Allen (1♀, USNM). **North Carolina:** Jackson Co., 2mi S of Cashiers Elev. 2,900ft, 18.iv.1964, H.V. Weems, Jr. (2♂1♀, CNCI); Raleigh, late March and late Oct., C.S. Brimley (2♂, USNM). **Texas:** Bexar Co., H.B. Parks (1♂, CNCI); College Station, 6.xi.1914, 23.x.1917, 19.x.1921, 20.x.1923, 2-3.xi.1930, 29.x.1933, 19.x.1935, 4.xi.1945 and 2.iv.1966, H.J. Reinhard and D.M. Wood (21♂13♀ USNM, CNCI, CNUC, TAMU); Huntsville, 21.x.1949, 27.vi.1950, F.A. Cowan (2♂1♀, TAMU); Lufkin, 17.x.1894, C.W. Johnson (1♂, USNM); Ottine, 20.x.1948 (1♂, TAMU); Willis, 03 (?) (2♂1♀, USNM, BMNH). **Virginia:** James City Co., Williamsburg, 6.x.1979, A. Freidberg (1♂, USNM).

#### HOST

Unknown.

#### NOTES

Collection records indicate that there are two generations a year. The first adults emerge from March to June and the second generation emerges from October to Novem-

ber. *Phasia grandis* is mainly distributed in the southern United States, with the northernmost collection localities in Illinois and Iowa.

#### 3.4.8 *Phasia grazynae* (Draber-Mońko, 1965)

(see Draber-Mońko 1965: 84-88, figs. 287-302)

*Alophora* (*Brumtallophora*) *grazynae* Draber-Mońko, 1965: 149.

*Phasia* (*Phasia*) *grazynae*; Herting 1984: 168 (catalog); - Herting and Dely-Draskovits 1993: 410 (catalog).

#### NOTES

This species was described by Draber-Mońko (1965) based on a male and a female from Japan [holotype ♀, Hikosan, Fukuoka, 23.v.1950, S. Kato; and allotype ♂, Bei Matsumoto, 20.ix.1953, H. Hasegawa (ZMPA, not examined)]. Both host and biology are unknown.

*Phasia grazynae* (Draber-Mońko) is similar to *Phasia albopunctata* (Baranov), but the males differ in the structure of distiphallus and females differ in relative lengths of ovipositor and sternite VII.

#### 3.4.9 *Phasia hemiptera* (Fabricius, 1794)

(Figures I-23, II-9.4)

*Syrphus hemipterus* Fabricius 1794: 284.

*Syrphus affinis* Fabricius 1794: 284.

*Syrphus subcoleopratus* (Linnaeus) of Fabricius 1775: 764 (misident.).

*Thereva subcoleopratus*: Panzer, 1800: 13, 14 (misident.).

*Alophora obscuripennis* Meigen, 1838: 217.

*Alophora orthoptera* Rondani, 1861: 217.

*Alophora obscura* Girschner, 1887: 384 (as *Alophora hemiptera* var.).

*Alophora vittata* Girschner, 1887: 384 (as *Alophora hemiptera* var.).

*Alophora eximia* Girschner, 1887: 385 (as *Alophora hemiptera* var.).

*Alophora* (*Alophora*) *hemiptera*: - Girschner, 1887: 10 - Rohdendorf 1947: 86 - Emden 1954: 27 - Draber-Mońko 1965: 127 (redescription).

*Alophora hemiptera*: - Brauer et Bergenstamm, 1889: 149 - Stein 1924: 258 - Rohdendorf 1933: 712 - Belanovskij 1951: 138 - Dupuis 1963: 107 (host) - Draber-Mońko 1964: 121.

*Allophora* (*Allophora*) *hemiptera*: Bezzi et Stein 1907: 577.

*Allophora daimio* Matsumura, 1916: 398 - Takano 1958: 1692, 4873.

*Allophora hemiptera*: Baer 1921: 127 - Lundbeck 1927: 92 - Wainwright 1928: 244 - Dupuis 1963: 106 (host).

*Phasia hemiptera*: Townsend 1938: 65.

*Alophora* (*Allophora*) *hemiptera*: - Day 1948: 41.

*Phasia* (*Phasia*) *hemiptera*: Herting 1984: 168 (catalog) - Herting and Dely-Draskovits 1993: 410 (catalog).

**DESCRIPTION**

Body length: 8-13 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity; 10-13 rows of hairs laterally. Frontal vitta parallel, reddish brown. Frontal vitta at base of antennae 0.3 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face yellow or brown, yellow pruinose. Parafacial lower part yellow, upper part brown to black, grey or yellow pruinose, haired (on upper part), 5-6 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, orange yellow, yellow pruinose. Vibrissa not differentiated; intervibrissal distance 0.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/2. Gena yellow or brown, yellow pruinose; hairs white; height 0.25 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.2 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown to black.

**THORAX.** Mesoscutum pruinose, with fine black hairs. 0(1)+1 acrostichal seta; 1+2 dorsocentral setae, or various; 0 postpronotal seta; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; densely white or yellow hairs, and without scale-like setae. Anepimeral setae hair-like, brown. 0 katepisternal seta. Scutellum yellow (basal line black); grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured; various patterns, broad; petiole of apical cell 0.15-0.18 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow or brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, with 1 *p*, apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus normal, or flattened, black. Fore claws black; 1.1-1.4 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black, with 1 *ad* and 2 *p*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p* and 1 *v*. Hind femur yellow (apical 1/3 black); whitish yellow hairs, or hairs black; scale-like setae absent. Hind tibia brown to black, with 6 *ad* and 4 *pd*.

**ABDOMEN.** Abdominal tergites with yellow spot or area (various patterns); pruinosity absent (only outer side with grey pruinosity). Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.1; relative width I+II:III:IV:V = 0.3:1:0.9:0.8. Hair spots of tergites IV, V indistinct. **TERMINALIA.** Syncercus broad, with a wide and shallow notch posteriorly. Surstylus slender, slightly downward, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium shorter than phallapodeme. Epiphallus well developed. Pregonite triangular. Postgonite broad, longer than pregonite, haired ventrally, outer

angle pointed. Phallus broad, slightly longer than hypandrium, with dense hairs dorsally. Distiphallus strongly bent dorsally, hook like, partly sclerotized.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes separated by a distance narrower than or as wide as ocellar triangle, not touching. Mesoscutum with brown hairs. Anterior spine-like setae of hind tibia present. Dorsum of tergites black, shiny. Sternite VII (sheath) longer than sternite VI; ox-horn like; narrow apically; bent, apex directed dorsally; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Syrphus hemipterus* Fabricius 1794. Holotype ♀ [but holotype is male according to Herting 1984:168, collected from England] (Copenhagen or lost, Townsend 1938: 65, not examined).

*Alophora hemiptera obscura* Girschner, 1887. Syntype, 1♂, "Girschner Collection, C.J. Wainwright, B.M. 1948-488" [no data] (BMNH, examined).

*Alophora hemiptera vittata* Girschner, 1887. Syntype, 1♂, "Girschner Collection, C.J. Wainwright, B.M. 1948-488" [no data] (BMNH, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRIA.** Kaltenleutgeben, 19.viii.1918, Gurti (3♂3♀, DEIC); Manhartsberg, Nied, Österr (1♂, ZMHU). **CHINA.** Beijing, Xiaolongman, 27.viii.1991, Y. Shi (2♂, IZAS); Heilongjiang, Guyuan, 15.vii.1970, (1♂, IZAS). **CORSICA.** La Foce de Vizzavone, 8.vi-13.vii.1893, Yerbury (6♂4♀, BMNH). **ENGLAND.** Lyndhurst, 22.7.1894, (C.J.Wainwright Collection, B.M. 1948-488)" (1♂, DEIC); Cornwall SX105912, Valency, 8.vii.1983, I.M. White (1♂, BMNH); Lynton, 17.viii.1941 and 7.viii.1895, (C.J.Wainwright Collection, B.M. 1948-488) (2♀, BMNH); New Forest, 1906 (2♂, BMNH); Sussex, Sheffield Pk., 25.vi.1943 (1♂, CNCI); Hants, New Forest, 16.vii.1907, A.J. Chitty (1♀, CNCI). **FRANCE.** Versailles, 12.v.1943 (1♂, CNCI); Forêt and Marly, 11.viii.1935 (1♀, CNCI). **GERMANY.** [?], 18.v.1944, auf Weißen Umbelliferen Blüten (1♂, CNCI); Bayrisch Wald, Freyung, 19.27.v.1935, H.Köller (1♂, DEIC); Frankenhausen A. Kyffn. viii.1950, K.Ermisch (1♂, DEIC); München, Fränk Mus., (in Würzburg) 1938 (1♂1♀, DEIC); Frankenhausen, Kyffhaeuser, 14.vii- 8.viii.1952, Dr. Feige (9♂, DEIC); Eisleben, 23.vii.1947 and 31.vii.1953, Dr. Feige (4♂1♀, DEIC); Bavaria, Berchtesgaden, G.Heinrich (1♂, CNCI); Brohldt Rhelnprov, 9.viii.1936 (1♂, CNCI); BM, Stromberg Hafnerhaslach, 22.v.1991, Tschorsnig (1♂, DEBU); B.M. [no more data], (1♂, BMNH); Stromberg, Häfnerhaslach, 7.viii.1988, Tschorsnig (1♂1♀, DEBU); Coburg, Mährenhausen, 27.vii.1989, Tschorsnig (1♀, DEBU); Tauberbischofsh Böttigheim, 16.viii.1987, Tschorsnig (1♀, DEBU); mer.occ. /Württemberg /Schönbuch Bei Tübingen/ Bebenhausen. 5.v.1963 (3♂3♀, CNCI); Thal. Thüring, vii and viii.1894, (6♂3♀, DEIC); mer.occ. Schwäbische Alb, w.-Rd., Eierbachtal bei Pfullingen: Wasserteien, 570-620m, 6.viii.1963 (2♂1♀, CNCI). **ITALY.** Montebeld, 3.x.1965, (1♂, CNCI). **JAPAN.** Hokkaido, Mts.

Daisetsu, Aizankei, Yukomanbetsu and Ten'ninkyô, 23.vi.1986, 12 and 19.vii.1986, F.C. Thompson (3♂, BLKU). **RUSSIA [USSR]**. Siberia, Altai Region, Teletskoya Lake Biological Station, Artebash near station, hunting cabin 40 km SE Artebash, 1500m; 9-12 and 10-15.vii.1991, S.A. Marshall (45♂47♀, DEBU, LACM). **SWITZERLAND**. Aigle, 14.v.1910, C.J. Wainwright (2♂1♀, BMNH); Delémont, 1-6.v.1969, Herting and Wood (5♂1♀, CNCI); Delémont, 16.viii. 1971, 20-23.viii.1972, L.P. Mesnil and W. Pschorn (4♂8♀, CNCI); Genolier, 30.vii.1945 (1♂, CNCI). **SPAIN**. [no more data], BM. 1927-84, (2♂, BMNH). **SWITZERLAND**. Aigle, 13.v.1910, C.J. Wainwright, ex: C.J. Wainwright Collection (11♂8♀, BMNH); Lucelle, Schweizer Jura, 4.8.1960, D.Schröder (1♀, DEBU). **YUGOSLAVIA**. [northern part], 13.viii. 1960 (1♂, BMNH). **DOUBTFUL LOCALITIES**. "? (Europe) (7♂1♀, CNCI)"; "Reuiebeau, 12.ix.1940 (2♂, CNCI)"; "(data unreadable) (22♂18♀, DEIC [1♂, BMNH])"; "Nicht-Baltikum, coll. Siebert (3♂1♀, DEIC)"; "Kissingen, 11.vii.1910, P. Stein (1♀, ZMHU)"; "Girschner Collection, C.J. Wainwright, B.M. 1948-488 (77♂34♀, BMNH)".

#### HOSTS

*Tropicoris rufipes* (L.) (Hemiptera, Pentatomidae): - (Dupuis 1960: 1746, 1963: 107 - Draber-Moňko 1965: 133).

*Palomena prasina* (L.) (Hemiptera, Pentatomidae): - (Dupuis 1960: 1746, 1963: 107 - Draber-Moňko 1965: 133).

*Pentatoma metalifera* (Motshulsky.) (Hemiptera, Pentatomidae): - (Draber-Moňko 1965: 133).

#### NOTES

*Phasia hemiptera* (Fabricius) is a Palearctic species with many morphological forms, especially in males (Draber-Moňko 1965: 127-137).

#### 3.4.10 *Phasia japonensis* Sun, sp. nov.

(Figures I-26, II-10.4)

#### TYPE MATERIAL

Holotype ♂, JAPAN, Nagano, Shimashima, Azumi-mura, 4.x.1988, E. Suglyama (BLKU); allotype ♀, JAPAN, Aomori Co., Asamushi, 18.x.1980, Sho Fukushi (BLKU); paratypes, 1♀, same as allotype (BLKU); 1♂1♀, JAPAN, Ishikawa, P. Shiramine, 10.x.1964, S. Takano (ZMPA); paratypes, 2♂8♀, JAPAN, Honshu, Tochigi, 600m, Shiobara Spa., 25-26.x.1988, H. Kurahashi (NIHJ).

#### DESCRIPTION

Body length: 8-13 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity; 6-7 rows of hairs laterally (not reaching to eyes). Frontal vitta black. Frontal vitta at base of antennae 0.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial brown; grey pruinose, almost bare, 2.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.9-1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena brown, grey pruinose, with a yellow spot; hairs white; height 0.18 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 2.1 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 2 postpronotal setae; presutural supra-alar seta present, strong; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae medium size, black; 1 katepisternal seta; 11-13 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured; white with light brown infuscation, broad; petiole of apical cell 0.18-0.2 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia black, with 1-2 *p*, apically with 1 *p* and 1 *d*. Fore tarsus black. Fore claws black; 1.2 times as long as fifth tarsomere. Pulvilli black. Mid femur black, mixed with whitish yellow and black hairs. Mid tibia black, with 1 *ad*, 2 *p* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 11-13 *pd* and 7-8 *ad*.

**ABDOMEN.** Abdominal tergites with yellow spot or area (with a black median longitudinal vitta); pruinosity absent. Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots of tergites IV, V indistinct. **TERMINALIA.** Syncercus broad, shallowly notched posteriorly; apex bent ventrally and hook-like. Surstylus straight, slender, slightly broadened apically, longer than cercus. Ejaculatory apodeme long, hook-like. Hypandrium as long as phallapodeme. Pregonite triangular, with a tooth ventrally. Epiphallus well developed. Postgonite slender, branched apically, haired ventrally. Phallus longer than hypandrium, dense hair dorsally. Dorsolateral process short, straight. Ventrolateral process long, strongly bent dorsally.

**FEMALE.** Body size smaller than male. Wing hyaline. Eyes separated by a distance 0.5 times as wide as ocellar triangle, not touching. Anterior spine-like setae of hind tibia



present. Abdomen black, thinly grey pruinose. Sternite VII (sheath) longer than sternite VI, broad posteriorly; two posterior angles bent down into triangles; sternite VII with linear wrinkles ventrally. Ovipositor extremely long, almost straight.

#### HOST

Unknown.

#### ETYMOLOGY

The name *Phasia japonensis* reflects the apparent restriction of this species to Japan.

#### NOTES

Two specimens housed in the Institute of Zoology, Academic Sciences of Poland, Warszawa, labelled as "*Alophora kagensis* Takano" are assigned as paratypes of *Phasia japonensis* Sun, **sp. nov.**

#### 3.4.11 *Phasia kudo* Sun, **sp. nov.**

(Figures I-28, II-10.4)

#### TYPE MATERIAL

Holotype ♂, JAPAN, Hokkaido, Toyotaki, Sapporo, 22.v.1988, [with pupa], S. Kudo (BLKU); allotype ♀, same as holotype (BLKU).

#### DESCRIPTION

Body length: 6.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance 0.5 times as wide as ocellar triangle. Fronto-orbital plate black; greyish yellow pruinose; 7-8 rows of hairs laterally (not reaching to eyes). Frontal vitta black, pruinose. Frontal vitta at base of antennae 0.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present (hair-like); inner vertical setae absent. Face black with grey pruinosity. Parafacial brown to black, grey or yellow pruinose, haired (on upper part), 2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow or brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.9-1.0 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena brown to black with grey pruinosity; hairs white; height 0.14 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.2. Length of oral opening 2.1 times its width. Occiput flattened, white pruinose; hairs white and black. Palpus yellow.

**THORAX.** Mesoscutum thinly pruinose (brown), without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 2 postpronotal setae; pre-

sutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, white and yellow; and without scale-like setae. Anepimeral setae strongly; black. 1 katepisternal seta. 7-9 meral setae. Scutellum black; brownish grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured, white with light brown infuscation, narrow; petiole of apical cell 0.16-0.18 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black, 1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 5-6 *pd* and 4-5 *ad*.

**ABDOMEN.** Abdominal tergites black; pruinosity brownish yellow; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus slender, with a notch posteriorly. Surstylus longer than cercus, strongly arched dorsally. Ejaculatory apodeme small, knob-like. Hypandrium shorter than phallapodeme. Pregonite as long as postgonite, haired dorsally. Postgonite pointed. Phallus broad, slightly longer than phallapodeme, without hairs dorsally. Dorsolateral process membranous; ventrolateral process well sclerotized, strongly bent ventrally.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus, not touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI, plate-like, broad apically, bent, apex directed ventrally, almost smooth ventrally. Ovipositor bent downward.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name is a patronym in honour S. Kudo, who collected the type material.

#### NOTES

It is very difficult to separate females of *P. kudo* and *P. aurulans*, but the male of *Phasia kudo* Sun differs from *Phasia aurulans* Meigen in lacking a distinct golden yellow pruinose spot on the mesonotum, and in characters of the terminalia.

**3.4.12 *Phasia nigrens* (Wulp, 1892), comb. nov.**

(Figures I-40, II-9.3)

*Hyalomya nigrens* Wulp, 1892: 185.*Alophorella nigrens*: - Guimarães 1971: 11 (catalog).*Allophora polita* Brooks, 1945: 669 (in part, misidentification).**DESCRIPTION**

Body length: 6-8 mm.

**ALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity; more than 3-4 rows of hairs laterally. Frontal vitta black. Frontal vitta at base of antennae 0.8-0.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present but fine; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.1-1.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile; brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 0.9-1.0 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena black with grey pruinosity; hairs white; height 0.15-0.18 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.0-1.1 times as long as pedicel; arista thickened on basal 0.32-0.38. Length of oral opening 2.2-2.4 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow (black ventrally).

**THORAX.** Mesoscutum thinly pruinose; presutural area sometimes with 3-5 black slender spots posteriorly, with fine black hairs. 0+1 acrostichal seta; 0(1)+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like hair absent. Anepimeral setae hair-like, black; 1 katepisternal seta; 8-11 meral setae. Scutellum black with grey pruinosity (thinly), with two pairs of marginal setae; apical setae present and distinct; discal setae arranged in 4-5 rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured; only limited on basal 1/2; broad; petiole of apical cell 0.28-0.30 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow or brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia brown to black, without bristles, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 1.0-1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia brown to black, with 1 *ad*, 1 *p* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs; scale-like setae absent. Hind tibia brown to black, with one row of *ad* and *pd*.

**ABDOMEN.** Abdominal tergites purple black, shiny; pruinosity absent; longitudinal

vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 0.4:1:1:0.8. Syntergite I+II and tergites III, IV shining, not pruinose. Pruinosity of tergite V absent, or present (yellow); hair spots indistinct. **TERMINALIA.** Syncercus broad triangular, posterior notch absent or very small. Surstylus slender, downward, longer than cercus. Ejaculatory apodeme small, knob-like. Phallapodeme longer than hypandrium, but almost as long as phallus. Epiphallus well developed. Pregonite triangular, pointed. Postgonite pointed, as long as pregonite. Phallus short, densely haired dorsally. Distiphallus well sclerotized, distally expanded into short, broad bilobed sclerite, with a pointed apex.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as ocellar triangle; not touching. Hind tibia with 1-2 rows of anterior spine-like setae. Syntergite I+II shiny, tergites III, IV, V grey or yellow pruinose. Sternite VII (sheath) longer than sternite VI, tubular like, broad apically, slightly bent, apex directed ventrally; sternite VII with linear wrinkles ventrally. Ovipositor straight, apex slightly downward.

#### TYPE MATERIAL

Syntypes, 3♀, MEXICO, Guerrero, Xucumanatlan, 7,000ft, H.H. Smith (BMNH, 1♀ abdomen missing, examined).

#### OTHER MATERIAL EXAMINED

**USA. New Mexico:** White Mts, 8.30, 8,200ft, Townsend (1♂, USNM, paratype of *Allophora polita* Brooks). **Texas:** Big Bend N.P., Green Gulch, Pine Can., Panther Junction and Boquillas, 5,000-6,000ft, 1-23.v.1959, J.F. McAlpine and W.R.M. Mason (14♂6♀, CNCI); Kerrville, 2.iv.1959, J.F. McAlpine (1♂, CNCI). **MEXICO.** Chihuahua (30mi NW), 5,000ft, Majalca Road, 17.iv.1961, Howden and Martin (1♀, CNCI); El Salto (10-11mi W and 26mi E), Durango, 8,000-9,000ft, 29.vi-12.vii.1964, J.F. McAlpine and L.A. Kelton (2♂7♀, CNCI); Durango (11mi W), Durango, 7,000ft, 23.vi.1964, J.F. McAlpine (1♀, CNCI); Sinaloa, El Palmito (4.5mi W), 6,300ft, 20.vii.1964, J.F. McAlpine (1♀, CNCI).

#### HOST

Unknown.

#### 3.4.13 *Phasia obesa* (Fabricius, 1798)

(Figures I-43, II-11.3)

*Thereva obesa* Fabricius 1798: 561.

*Musca nebulosa* Panzer 1798: 20.

*Thereva cinerea* Fabricius, 1805: 221.

*Thereva muscaria* Fallén, 1851: 232.

- Phasia atropurpurea* Meigen, 1821: 193.  
*Phasia violacea* Meigen, 1824: 193.  
*Phasia hamata* Meigen, 1824: 193.  
*Phasia albipennis* Meigen, 1824: 194.  
*Phasia nubeculosa* Meigen, 1824: 195.  
*Phasia umbripennis* Meigen, 1824: 195.  
*Phasia nervosa* Meigen, 1824: 196.  
*Hyalomyia nebulosa* Robineau-Desvoidy, 1830: 300.  
*Hyalomyia fuscipennis* Macquart, 1835: 203.  
*Phasia speciosa* Curtis, 1838: 697.  
*Phasia (Alophora) aenea* von Roser, 1840: 57.  
*Phasia umbrata* Zetterstedt, 1844: 1249.  
*Phasia grisea* Zetterstedt, 1844: 1250.  
*Phasia flavipennis* Zetterstedt, 1844: 1250.  
*Hyalomyia fulgipennis* Rondani, 1861: 215.  
*Hyalomyia murina* Rondani, 1861: 216.  
*Hyalomyia areolaris* Rondani, 1861: 216.  
*Hyalomyia purpurea* Robineau-Desvoidy, 1863: 244.  
*Hyalomyia coeruleascens* Robineau-Desvoidy, 1863: 245.  
*Hyalomyia nitida* Robineau-Desvoidy, 1863: 250.  
*Hyalomyia fuscana* Robineau-Desvoidy, 1863: 254.  
*Hyalomyia atra* Robineau-Desvoidy, 1863: 254.  
*Hyalomyia tomentosa* Rondani, 1868: 603.  
*Hyalomyia umbripennis* Girschner, 1886: 5 ( as *Hyalomyia obesa* var.).  
*Hyalomyia nebulosa* Girschner, 1886: 65 ( as *Hyalomyia obesa* var.).  
*Hyalomyia fuscipennis* Girschner, 1886: 66 ( as *Hyalomyia obesa* var.).  
*Hyalomyia latipennis* Girschner, 1886: 68 ( as *Hyalomyia obesa* var.).  
*Alophora (Hyalomyia) obesa*: Girschner, 1886: 1 - Girschner, 1887: 28 - Bezzi et Stein 1907: 580 -  
 Lundbeck 1927: 95 - Wainwright 1928: 244 - Emden 1954: 27 - Rohdendorf 1947: 86 - Day  
 1948: 41.  
*Alophora obesa*: Baer 1921: 128.  
*Alophora obesa*: Stein 1924: 259 - Rohdendorf 1933: 712 - Belanovskij 1951: 140.  
*Alophorella obesa*: Townsend 1938: 36.  
*Alophora (Alophorella) obesa*: Dupuis 1949: 505.  
*Alophorella obesa*: Dupuis 1963: 105 (host, catalog).  
*Alophora (Alophorella) obesa*: Draber-Moňko 1965: 159.  
*Phasia (Phasia) obesa*: Herting 1984: 169 (catalog) - Herting and Dely-Draskovits 1993: 410 (cat-  
 alog).

## DESCRIPTION

Body length: 6-8 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance wider than ocellus but narrower than ocellar triangle. Fronto-orbital plate black, yellow or grey pruinose, 4-5 rows of hairs laterally. Frontal vitta black. Frontal vitta at base of antennae 0.8 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown to black with grey pruinosity. Vibrissa well differenti-

ated; intervibrissal distance 1.1-1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena brown to black with grey pruinosity; hairs white; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna pedicel yellow or brown, first flagellomere black, 1.2 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 3.1 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum strongly pruinose; 4 black longitudinal vittae, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and brown; and without scale-like setae. Anepimeral setae medium size, black. 1 katapisternal seta. 4-9 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown to black. Wing hyaline or pictured, narrow or broad; petiole of apical cell 0.20-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow, or brown. **LEGS.** Fore femur swollen black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown; 1.1-1.3 times as long as fifth tarsomere. Pulvilli brown. Mid femur black, with whitish yellow hairs, or hairs black. Mid tibia brown to black, with 0-1 *ad*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 0-1 *p*, 1 *v* and 1 *d*. Hind femur brown to black; whitish yellow hairs, or hairs black; scale-like setae absent. Hind tibia brown to black, 6 *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent or present; dorsum of tergites purple shiny, or from thinly to strongly grey pruinose. Relative length of abdominal tergites I+II:III:IV:V = 0.4:1:1:0.7; and relative width I+II:III:IV:V = 1.5:1:1:1.2. Hair spots indistinct. **TERMINALIA.** Syncercus with a semicircular notch posteriorly; Surstylus slender, longer than cercus. Ejaculatory apodeme small, knob-like. Epiphallus well developed. Pregonite long, pointed, longer than postgonite, haired dorsally. Postgonite pointed. Phallus and phallapodeme longer than hypandrium. Phallus densely haired dorsally. Distiphallus not well sclerotized.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) longer than sternite VI; tapered, narrow apically; not bent, apex straight; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Thereva obesa* Fabricius, 1798. Holotype ♂, Italy (Copenhagen or lost, Townsend 1938: 36, not examined).

*Hyalomyia obesa umbripennis* Girschner, 1886. Syntypes, 2♂, "Ex: Girschner Collec-

tion" [no data] (BMNH, examined).

*Hyalomyia obesa nebulosa* Girschner, 1886. Syntypes, 1♂, "Ex: Girschner Collection" [no data] (BMNH, examined).

*Hyalomyia obesa fascipennis* Girschner, 1886. Syntypes, 2♂, "Ex: Girschner Collection" [no data] (BMNH, examined).

*Hyalomyia obesa latipennis* Girschner, 1886. Syntypes, 2♂, [SWITZERLAND], Meirngeu ?, ex: Girschner Collection, [no data] (BMNH, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRIA.** Matrei in Osttirol, 14.viii.1967 (1♂, BMNH); Raidina and Unterfravenhaid, vii-viii.1980, ex: *Lygus* sp., H. Hoyer (1♂1♀, USNM); Wien, viii.1940, H. Loew (1♂, ZMHU) Feldkirch, Vorarlberg, Moosbrugger (1♀, DEIC); Zillertal, umg. Mayrhofen, 4.vii.1914, H. Wagner (1♂4♀, DEIC). **CHINA.** Inner Mongolia, Ulan Qi, 4.viii.1971 (1♂1♀, IZAS); Sichuan [Szechuen], Yellow Dragon Gorge, near Sougpan 1924, 12,000-14,000ft, D.C. Graham Coll.(1♂, USNM); Sichuan, Yanyuan, 2,200m, 18.ix.1986, Y. Wang (1♂, IZAS); Tibet, 10,000ft, Yatung, viii.1927, Bailey (1♀, BMNH); Tibet, near Tang-Gu, 14,000ft, 3-6.viii.1930, D.C. Graham (1♂, USNM); Penniu, 28.ix.1925, C.Y. Wong (1♀, USNM). **CROATIA.** Elviacliu (?), 19.viii. 1933, N. Baranov Coll.1960 (1♂, USNM); Pctenica, 19.vii.1016 (1♂1♀, USNM); Twcopalze (?), 25.vi.1916, N. Baranov Coll.1960, (1♂, USNM); Zagreb, 25.vii. 1908, 20.vii.1929 and 18.ix. 1929, N. Baranov Coll. 1960 (3♂1♀, USNM). **CYPRUS.** Amathus, 14.ii.1936, G.A. Mavromoustakis (1♂, BMNH); C. Glaszner (2♂, BMNH); 12.v.1928, H.M. Morris (1♂, BMNH); Dnavlos, 10.iv.1971, K. Guichard (1♂, BMNH); Kantara, 18.v.1948, G.A. Mavromoustakis (7♂, BMNH); Mt. Troodos, 1.vii.1937, G.A. Mavromoustakis (2♂, BMNH). **CZECHOSLOVAKIA.** Carlsbad, 8-22.viii.1915, coll. Oldenberg (3♂4♀, DEIC). Bohemia, mer. Horusicky, Rybnik, 4.9.1967, M. Chvala (1♀, BMNH). **DENMARK.** Nielsen, W.R. Walton Collection (1♂, USNM). **ENGLAND.** Jersey, St. Catharines, 6.8.46, (1♂, USNM). **FRANCE.** Ardennes, Vendresse, 17.vii.1912 (1♂, USNM); Argeles-Gazost, South France, 10.viii.1911, C.J. Wainwright (1♀, BMNH); Colmar, H.R., ex: *Hypera postica*, 24.vi.1964, J. Balakine (1♀ with pupa, USNM); Fontainebleau (21km N), ex: *Lygus* sp. 29.viii.1962, R.I. Sailer (1♂ with pupa, USNM); Hautes Alpes, Brunissard, 5.vii.1992, Tschorsnig (1♂, DEBU); La Gueue les Yuelines, 15.viii.1936, (1♀, CNCI); Marans (M.-et-L.), 10-7-21, (1♀, BMNH); Marans (M.et L.), 4.vii. 1921 (3♂, BMNH); Richelieu, 27.viii and 13.ix.1965, C. Dupuis (3♂, USNM); Sacias, 10.viii.1927 (1♀, BMNH); Vernet les Bains, Pyrénées-Or., 15.vi.1920, C.J. Wainwright (1♀, BMNH); Void, M.and M. ex: *Lygus rugulipennis*, 5.v.1963 (adults) and 20.v.1963, R.I. Sailer (1♂1♀, with pupae, USNM). **GERMANY.** Berlin, 1894-1912, (31♂19♀, DEIC); Berlin, 4.viii.1926, G. Enderlein (1♂, ZMHU); Dresden, 21.viii.1903, coll. Liehtwardt (11♂5♀, DEIC); Fürth, I.B. Dr. Trautmann, 1918, David, G. Hall Coll. (2♂1♀, USNM); Frankfurt Oder, M.P. Riedel, Reinhard Collection (6♂4♀, CNCI); Potsdam, 6.vi.1916, 27.vi.1909 (5♂, DEIC); Rangsdorf,

10.8.1918, coll. Oldenberg (26♂2♀, DEIC); Sachsen, Genthin, 20.vii.1895, P. Stein (1♂, ZMHU); Riedel Pößneck, coll. Oldenberg (3♂3♀, DEIC); Thal, i. Th, viii.1894, coll. Oldenberg (5♂2♀, DEIC). **GREECE.** Creta, v.0. coll. Liehtwardt (6♂, DEIC). **HUNGARY.** Budapest, 21.vi.1901, coll. Liehtwardt (1♀, DEIC); Szár, 15.vi.1902, coll. Liehtwardt (4♂1♀, DEIC). **INDIA.** Tribeni, 6.vi.1943, H. Loew (1♀, ZMHU); Pcuni, Grunei, L. Loew (1♂, ZMHU). **ISRAEL.** Latroun, 22.xi.1968, S. Bleszynski (1♂, CNCI). **ITALY.** [?], (1♀, DEIC); Bozen, vi.1996, coll. Oldenberg (1♀, DEIC); Eyrs, 5.8.09, coll. Oldenberg (1♂, DEIC); Macugnaga, 21.vii.1900, Oldenberg (2♂1♀, DEIC); Lia Centrale, 28.x.1918 (1♂, BMNH); Umbria Prov., Trevl., 13.viii.1944, G.E. Shewell (1♀, CNCI); Villalatina (Prov. Caserta), 1,500ft, O. Querci (1♂, BMNH); Marche, Monti Sibillini, Bolognola, 1-20.vii.1935, L. Ceresa (1♂, AMNH). **JAPAN.** Kyushu, Mt., Tachibana, Fukuoka City, 8.v.1980, H. Shima (1♀, BLKU); Obihiro, S. Takano (1♂, CNCI). **LATVIA.** Curland, C. Siebert (8♂12♀, DEIC). **LEBANON.** Beirut, Amchit, 35 Km N. 23-30.ix.1971, A.K. Walker (8♂10♀, CNCI). **MOROCCO.** Asni, viii.1930, A. Mackie (1♀, BMNH). **NORWAY.** Opland, Breivegen Bru., 4-18.viii.1979, S. Andersen (1♂, CNCI); Eidskog, ix.1900, N. Strand (5♂3♀, DEIC), **POLAND.** Bogucice, 21.vii.1963, A. Mońko (1♀, USNM); Bieszczady, 23.ix.1968, S. Bal (1♂, USNM); Schlesien, coll. Letzner (9♂4♀, DEIC); Urocz, Sokotöh D., 7.vii.1961, A. Mońko (1♂, USNM). **RUSSIA [USSR].** Siberia, Novosibirsk Region, Chany Lake Biological Station, near Zdvensk, on flowers, 1-5.vii.1991, S.A. Marshall (8♂7♀, DEBU, LACM); Tolmatschevo, vic. Luga, 17.vii.1937, and 30.vii.1936, Stackelberg (2♀, USNM). **SPAIN.** Lerida, Val d'Aran, Valencia de Aneu, 18.ix.1956 (1♀, BMNH); Merrill, H. Prime 6.viii.1957 (1♂, CNCI); Prov. Salamanca, Villar de Ciervo, 20.v.1988 Tschorsnig (1♀, DEBU); Prov. Lérida, Vallar de Aran, Arties, 29.vi.1992, Tschorsnig (1♂, DEBU); Prov. Lérida, 6 km NW Llavorsi, 1.vii.1992, Tschorsnig (1♂, DEBU); Prov. Huesca, Linás de Broto, 26.vi.1992, Tschorsnig (1♂, DEBU). **SWEDEN.** Bolka, SE of Oregrund, 14.vii.1980, A.C. Pont (1♂, BMNH). **SWITZERLAND.** Delémont, 900m, 30-31.vii.1958, H. Pschorn (1♂1♀, CNCI); Delémont, 14-24.viii.1964, C.W. Sabrosky (1♂, USNM); Delémont, Domont, 26.viii.1964, (1♂, DEBU); Delémont, Domont, 13-23.ix.1966 (6♂, BMNH); Delémont, 8-23.viii.1971-74, 28.viii.1964 (6♂2♀, CNCI); Eclepens, 10.viii.1914. C.J. Wainwright Collection, B.M.1948-488 (1♀, BMNH); Meirngeu[?], ex: Girschner Collection, C.J. Wainwright Collection, B.M. 1948-488 (93♂, BMNH). **YUGOSLAVIA.** Kcanjska Gola, 30.v.81, P.M. Ackland (1♂, BMNH). **DOUBTFUL LOCALITIES.** "Beths, sunninghill, 20.vii.1948 (1♀, USNM)"; "Achau, David G. Hall Coll. (1♀, USNM)"; "Muauof(?), 29.vi.1916 (1♂, USNM)"; "Kis-Pöse, Méhely (1♂, USNM)"; "A.L. Melander Collection 1961, with det label by L. Strobl (2♂, USNM)"; "Europe: (no detailed location data or unreadable) (51♂21♀, DEIC)"; "Tullu-A, ex: *Lygus rugulipennis*, 15.viii.1977, L.P. Mesnil (1♂1♀, CNCI)"; "Dania, B. VB92, Slotslyngen, 30.vi.10.vii.1981, S. Andersen (1♀, CNCI)"; "Ingeiheimische Au. b. Geisenheim, 19.v.1923 (1♀, CNCI)"; "Geisenheim (Rheingau), 23.ix.1922 (1♂, CNCI)"; "Riedel Possneck, Reinhard Collection (1♂1♀, CNCI)"; "ex:



Girschner Collection, C.J. Wainwright Collection, B.M. 1948-488,(no other readable data) (7 ♂1 ♀, BMNH)"; " ex: Girschner Collection (45 ♂45 ♀, BMNH)".

## HOSTS

*Zicrona caerulea* (L.) (Hemiptera, Pentatomidae): - (Dupuis 1949: 505, 1963: 105 - Draber-Mońko 1965: 78).

*Leptopterna dolabrata* (L.) (Hemiptera, Miridae): - (Southwood and Leston 1959: 313 - Dupuis 1963: 105 - Draber-Mońko 1965: 78).

*Lygus pratensis* (L.) (Hemiptera, Miridae): - (Dupuis 1963: 105 - Draber-Mońko 1965: 78).

*Myrmus miriformis* (Fallen) (Hemiptera, Rhopalidae): - (Dupuis 1963: 105 - Draber-Mońko 1965: 78).

*Beosus maritimus* (Scopoli) (Hemiptera, Lygaeidae): - (Dupuis 1963: 105 - Draber-Mońko 1965: 78).

*Lygus rugulipennis* Poppins (Hemiptera, Miridae) - France.

*Lygus sp.*, (Hemiptera, Miridae): - France (Fontainbleau), Austria (Raidina and Underfravenhaid).

Doubtful Host. *Hypera postica* (Gyllenhal) (Coleoptera, Curculionidae) - France (Colmar).

## NOTES

*Phasia obesa* (Fabricius) is highly variable, especially for wing patterns, abdominal pruinosity and the shape of sheath (see Draber-Mońko 1965: 159-167 [figs: 322-357]).

This species is similar to the Nearctic species *Phasia aeneoventris* (Williston) and *Phasia robertsonii* (Townsend), and the Neotropical species *Phasia moerens* (Wulp). Males of *Phasia obesa* can be separated from these species on the basis of the distiphallus and pregonite, but no diagnostic character has been found for females.

### 3.4.14 *Phasia piceipes* (Wulp, 1892), comb. nov. (Figures I-45, II-11.2)

*Hyalomya piceipes* Wulp, 1892: 186.

*Alophorella piceipes*: Guimãraes 1971: 12 (catalog).

## DESCRIPTION

Body length: 8.5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, greyish yellow pruinose, 4-5 rows of hairs laterally (hairs white, not reaching eyes). Frontal vitta brown, pruinose. Frontal vitta at base of antennae 2.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but

fine; outer vertical setae present; inner vertical setae absent. Face yellow; strongly yellow pruinose. Parafacial brown, yellow pruinose, bare, 1.2 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting; orange yellow, yellow pruinose. Vibrissa well differentiated; intervibrissal distance 1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena yellow and brown, yellow pruinose; hairs white; height 0.11 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna pedicel yellow or brown, first flagellomere black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.23. Length of oral opening 1.5 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum strongly yellow pruinose, with 4 black longitudinal vittae; and fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; pre-sutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs white and yellow; and without scale-like setae. Anepimeral setae strongly, black; 1 katepisternal seta; 11-14 meral setae (yellow). Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline, narrow; petiole of apical cell 0.22-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow and brown. **LEGS.** Fore femur brown; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia brown, without bristles, apically with 1 *d*. Fore tarus flattened, brown. Fore claws brown, apex black; 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia brown, with 1 *ad* and 1-2 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *v* and 1 *d*. Hind femur brown; ventrally and laterally with whitish yellow hairs, dorsally with black hairs; scale-like setae absent. Hind tibia brown, with 7 *ad* and 4 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity brown, but thin; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus with a small notch posteriorly, apex strongly bent ventrally. Surstylus broad, slightly upward, longer than cercus. Ejaculatory apodeme arched at right angle. Hypandrium broad, longer than phallapodeme. Epiphallus well developed. Pregonite shallowly forked, haired dorsally. Postgonite sharp pointed, longer than pregonite. Phallus slender, 1.6 times as long as hypandrium, with wrinkly membrane ventrally and fine hairs dorsally. Distiphallus well sclerotized.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus; not touching. Thorax with grey pruinosity. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) longer than sternite VI, tapered, narrow apically, slightly bent, apex directed ventrally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**TYPE MATERIAL**

*Hyalomya piceipes* Wulp, 1892. Syntype 1♀, MEXICO, Guerrero, Omilteme, 8,000ft, July, H.H. Smith (BMNH, head missing, examined).

**OTHER MATERIAL EXAMINED**

**ARGENTINA.** Hauk Pasauce [?] (1♀, MNHN). **BRAZIL.** Nova Teutonia, 27°11'S 52°23'W, 300-500m, 3.xi.1960, Fritz Plaumann (1♀, CNCI). **MEXICO.** Durango, 24mi W La Ciudad, 7,000ft, 11.vii.1964, J.F. McAlpine (1♂, CNCI); Sinaloa, 4.5mi W El Palmito, 6,300ft, 20.vii.1964, J.F. McAlpine (1♀, CNCI); "HI-51, Reinhard Collection" [no further data] (1♀, CNCI).

**HOST**

Unknown.

**3.4.15 *Phasia robertsonii* (Townsend, 1891)**

(Figures I-49, II-9.2)

*Hyalomya robertsonii* Townsend, 1891: 136.

*Alophora fumosa* Coquillett, 1897: 46, **syn. nov.**

*Alophora nitida* Coquillett, 1897: 45, **syn. nov.**

*Alophora phasioides* Coquillett, 1897: 46, **syn. nov.**

*Alophora pulverea* Coquillett, 1897: 46, **syn. nov.**

*Phasia brevineura* West, 1925: 122, **syn. nov.**

*Phasia furva* West, 1925: 123, **syn. nov.**

*Alophora opaca*: - Painter 1929: 105-106 (host, biology)

*Alophoropsis nitida*: - Brooks 1945: 662 (mention).

*Alophoropsis phasioides*: - Brooks 1945: 663 (redescription).

*Oedematopteryx pulverea*: - Brooks 1945: 665 (redescription).

*Oedematopteryx fumosa*: - Brooks 1945: 666 (redescription and host) - Clancy and Pierce 1966: 855, 857 (host).

*Alophorella aeneoventris robertsonii*: Brooks 1945: 671 (in part).

*Alophorella phasioides*: - Sabrosky and Arnaud 1965: 968 (catalog).

*Allophora aeneoventris*: - Medler 1961: 102 (host, biology).

*Alophorella nitida*: - Sabrosky and Arnaud 1965: 968 (catalog).

*Alophorella fumosa*: - Sabrosky and Arnaud 1965: 968 (catalog) - Arnaud 1978: 4 (host catalog).

*Alophorella pulverea*: - Sabrosky and Arnaud 1965: 968 (catalog) - Arnaud 1978: 4, 59 (host catalog) - Clancy and Pierce 1966: 855,857 (hosts) - Medler 1961: 101-102 (biology) - Greene 1922: (pupa, as *Alophora*; descr., fig.45 on pl. 10).

*Phasia robertsonii*: - Day 1995: 100-106 (hosts, ecology).

**DESCRIPTION**

Body length: 5.5-11 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes usually separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, yellow or grey pruinose, 4-6 rows of

hairs laterally. Frontal vitta nearly parallel, black or brown. Frontal vitta at base of antennae 0.65-0.75 times as wide as fronto-orbital plate anteriorly. Ocellar setae absent, or present but fine; outer vertical setae absent, or present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black, grey, or yellow pruinose, bare, 1.0-1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, or brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.4-1.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/8-1/5. Gena brown to black with grey pruinosity; hairs white, or black; height 0.1-0.11 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 2.5 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta or indistinct, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 2 postpronotal setae; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae medium size, or strongly, black; 1 katepisternal seta; 7-12 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline, or pictured (various patterns), narrow or broad; petiole of apical cell 0.25-0.38 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow or brown. **LEGS.** Fore femur brown, or brown but upper part black, with white or yellow or black hairs. Fore tibia brown, or brown but upper part black, with 0-1 *p*, apically with 0-1 *v*, 0-1 *pv*, 1 *p* and 1 *d*. Fore tarsus normal; brown to black. Fore claws brown, or brown but apex black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli yellow, or brown to black. Mid femur brown to black, with whitish yellow or black hairs. Mid tibia brown to black, with 1 *ad*, 0-1 *p* and 1 *v*, apically with 1 *ad*, 0-1 *a*, 1 *av*, 1 *pv*, 0-1 *p*, 1 *v* and *d*. Hind femur brown to black; whitish yellow or black hairs; scale-like setae absent. Hind tibia brown to black, with 5-6 *ad* and 4-6 *pd*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent; tergites purple shining, or with thinly or strongly yellowish grey pruinosity. Relative length of abdominal tergites I+II:III:IV:V = 1.3-1.5:1:1:1.1; relative width I+II:III:IV:V = 0.6:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus with a small and shallow notch posteriorly; apex with a pair of saw teeth ventrally. Surstylus slender, slightly broadened posteriorly, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium broad, as long as phallapodeme. Epiphallus well developed. Both pregonite and postgonite pointed. Phallus 1.2-1.3 times as long as hypandrium, haired dorsally on basal 1/2. Ventrolateral process bent ventrally, and hook-like, apex membranous. Dorsolateral process straight, apex membranous.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus; not touching. Anterior spine-like setae of hind tibia present. Tergites with thinly grey or yellowish grey pruinosity. Sternite VII (sheath) longer than sternite VI, tapered, narrow apically, slightly bent, apex directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia robertsonii* Townsend, 1891. Co-types 2♀, [USA], South Illinois, Robertson [No. 4465-4466] (SEMC, examined).

*Alophora nitida* Coquillett, 1897. Holotype ♂, [USA], Virginia, Potomac Creek, 23.v.1896, C.W. Johnson, type no. 3520 (USNM, examined).

*Alophora fumosa* Coquillett, 1897. Holotype ♂, [USA], New Jersey, Clementon, 18.v.1896, C.W. Johnson, type no. 3524 (USNM, examined);

*Alophora phasioides* Coquillett, 1897. Holotype ♂, [USA], New Hampshire, Mrs. A.T. Slosson, type no. 3523 (USNM, examined);

*Alophora pulverea* Coquillett, 1897. Holotype ♂, [CANADA], Ontario, Grimsby, 7.x.1894, type no. 3525 (USNM, examined).

*Phasia furva* West, 1925. Paratypes, 1♂3♀, [USA], New York, Molean Res., Grass Bog, viii.27-ix.14.1924, viii.12.1916 (CUIC, examined); 2♂, [USA], New York, Ithaca, vii.21.1903, ix.10.1919 (CUIC, examined).

*Phasia brevineura* West, 1925. Holotype ♂, [USA], New York, Ithaca, 3.vii.1916 (CUIC, No.1858, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Nova Scotia:** Inverness Co., Meat Cove, 13.vii.1983, R.A. Layberry (1♂, CNCI); Victoria Co., Cape Breton, 11-13.vii.1983 (1♂, CNCI). **New Brunswick:** McAdam, 26.viii.1991, S.A. Marshall (1♀, DEBU); Douglas, 7.viii.1913, J.D. Tothill (1♀, CNCI). **Ontario:** Alg. Pk., Wildlife Sta., 9.vii.1965 (1♂, DEBU); Belleville, 1.viii.1950, J.C. Fisher (2♀, DEBU); Bells Corner, 10.ix.1945, G.S. Walley (1♂, CNCI); Bradford, 5.vi.1953, D.H. Pengelly (1♀, DEBU); Brockville, 17.x.1903, W. Metcalfe (1♂, CNCI); Burlington, Bronte Cr. Provincial Park, 17-20.vii.1983, Brown and Marshall (1♂2♀, DEBU); Carleton Co., Richmond (8km S), 26-30.ix.1983, Cooper and Wood (1♀, CNCI); Charlton, vii.1933, 14-20.ix.1983, H.S. Parish, B.E. Cooper (2♂, USNM); Chatterton, 19.vi.1945, R.W. Smith (1♂, CNCI); Durham, 17.vi.1955, D.H. Pengelly (1♂, DEBU); Gananoque, 9.vii.1941, G.S. Walley (1♀, CNCI); Glengarry, 12.vii.1938 (1♂, AMNH); Grassie, 31.v.1979, B. Wit (1♀, DEBU); Guelph, 22.vii.1948, 4.vii.1992, J.G. Oughton, R.A. Cannings (1♂1♀, DEBU); Guelph, 10.vi.1964, 22.vii.1977, 29.viii.1978, 20.vii.1986, 11.x.1974, 30.ix.1962, 22.ix.1958, 11.vi.1975, 1.ix.1983, 5.vi.1984, 11.ix.1993, A. Harris, D.J. McComb, B.R. Carswell, B.S. Heming, G. Aiudi, E. Lippert, G.H. Bowles, M.L.B. Farrell, J.M. Cumming, I.K. Kigatiira, D.H. Pengelly, K. Barber

(8♂12♀, DEBU, CNCI); Halton Co., Campbellville, 21.vii.1968, W. Plath, Jr. (2♂, ROME). Hilton Township, 10.ix.1992, J.E. Swann (1♂, DEBU); Jordan, 28.vi.1919, 8.vii.1919, C.H. Curran and W.A. Ross (3♂2♀, USNM, AMNH, CNCI); Kelly Lake, 26.vii.1933, Parish (3♀, USNM); Lake Abitibi, 5-11.vii.1925, N.K. Bigelow (53♂16♀, ROME); Low Bush, Lake Abitibi, 19-23.vii.1925, N.K. Bigelow (3♂, CNCI); Manotick, 17.ix.1965, B.V. Peterson (1♂, CNCI); Marmora, 29.vii.1952, C. Boyle (1♂1♀, CNCI); Maynooth, 25.ix.1957, J.F. McAlpine (1♂, CNCI); Meaford, 15.vi.1961, Kelton and Brumpton (1♀, CNCI); Metcalfe, 10-28.x.1982, 3.viii and 21.ix.1983, 26.ix.1984, 17.ix and 2.x.1985, 12.ix.1986, 15.viii-9.x.1993, B.E. Cooper (23♂28♀, CNCI); Newbury, 28.vi.1986, W.A. Attwater (1♀, DEBU); Newmarket, v.28.1933, H.S. Parish (1♂, USNM); Orangeville, 14.ix.1979, S.A. Marshall (2♀, DEBU); Orillia, 1.viii.1938, 10.vi.1925, C.H. Curran (3♂, AMNH); Orono, 3.ix.1925, N.K. Bigelow (1♀, TAMU); Osgoode, 28.v.1965, J.R. Vockeroth (1♀, CNCI); Ottawa, 11.x.1920, 24.ix. and 20.x.1912, 1.x.1962, 15.vii.1957, 20.ix.1947, 5.vi.1949, 1.x.1961, 24.ix.1989, J.R. Vockeroth, A.R. Brooks, J.E.H. Martin, P. Ward, J.I. Beaulne. (15♂4♀, CNCI, USNM); Ottawa, W.R. Thompson (1♂, CNCI); Pelee Island, W Lighthouse Pt., 10.vi.1993, B. Larson (4♂, DEBU); Port Rouers, 19.vii.1977, W.A. Attwater (1♂, LACM); Rockwood, 21.ix.1963, D.R. Stoltz (1♂, DEBU); Simcoe, 29.v. and 3.vi.1939, G.E. Shewell (6♂, CNCI); Speedside, 3-8.1965, C.J. Edwards (1♀, DEBU); Wallaceburg, 3.vi.1957, J.G. Chillcott (1♂, CNCI); Wasaga, 21.ix.1981, E.J. Hancock (1♂, LACM). **Quebec:** Abbotsford, vi.1935 and 4.vi.1937, G.E. Shewell (2♂, CNCI); Aylmer, 28.ix and 10.viii, C.H. Curran (8♂6♀, USNM, CNCI, AMNH); Cap Chat, 13.viii.1954, J.E.H. Martin (1♂, CNCI); Cascapedia R. Gaspé, 30mi N New Richmond, 1-6.viii.1983, W. Middlekauff (1♀, CASC); Clarenceville, 16.vii.1935, G.H. Hammond (1♂, CNCI); Gatineau Park, Harrington Lake, 5.vi.1954, E.E. Sterns (1♂, CNCI); Gatineau Co., Masham Twp., 24.vii-1.viii.1983, D.M. Wood (29♂16♀, CNCI); Hull, 25.ix.1923 and 6.viii.1965, C.H. Curran etc. (2♂1♀, CNCI); Ile d'Orleans, 2.viii.1940, P. Morisset (1♂, AMNH); Kam Co., Parke Reserve, 950ft, 26.viii.1957, W.R.M. Mason (1♀, CNCI); Knowlton, 6.viii.1929, G.S. Walley (1♂, CNCI); La Trappe, 4.ix.1934, J. Ouellet (1♂, AMNH); La Verendrye Prov. Pk., 20.viii.1965 and 4.ix.1972, D.M. Wood (4♂1♀, CNCI); Lac-Sept Iles, Laurentide Pk., 1.viii.1955, Martin and Munroe (1♂, CNCI); Montreal, 21.ix.1905 and 30.v., 14.x, 7.vi, J. Ouellet, A.L. Melander (4♀, USNM, AMNH); Montreal, 8.ix.1901 (1♀, BMNH); Oka, 31.viii.1956, H.C. Hockett (1♀, USNM); Old Chelsea, King Mt., 16.vi.1961, J.G. Chillcott (1♂, CNCI); Old Chelsea, 30.viii.1961, 14.vi.1963 and 24.vi.1965, B.V. Peterson J.R. Vockeroth (1♂2♀, CNCI); Port au Saumon, 1.x.1977, C.W. Berg (1♂1♀, CNCI); Rigaud, 26.vi.1906, (1♂, AMNH); St. Annes, 9.viii.1938 (1♀, AMNH); St. Johns, 23.ix.1905, (1♂, USNM); Val d'Espoir, 5.viii.1939, J. Ouellet (1♂, AMNH). **USA. Connecticut:** Avon, Avon Old Farms, 16.vi.1929, C.H. Curran (1♂, AMNH). **District Of Columbia:** Rock Creek, v.30.1917, vi.27.1913, v.23, C.H.T. Townsend, R.C. Shannon, on Fls *Chrysanthemum*, (3♂5♀, USNM); Tennalytown, 27.x, on Aster (1♀, USNM). **Florida:** Miami, 8-

14.vi.1928, D.G. Hall (1♂2♀, USNM). **Georgia:** "*Sinea spinipes*, Byron, GA, *sinea* collected 6/26, pupa emerge 7/2/79, fly emerge 7/10, A.A. Amits" (1♂, USNM); "*Podisus* sp. (on vetch), Byron, GA, Bug collected 6/7/79, pupa 6/13/79, fly emerge 6/26/79, A.A. Amits" (1♀, USNM). **Illinois:** Chicago, 8.v.1896, 6.vi.1908 and 28.v.1899 D.G. Hall and A.L. Melander at al (1♂2♀, USNM, AMNH); Champaign Co., 6.vi.1954, R.E. Woodruff (1♀, USNM); Rockford 10mi. S., 10.v.1968, R.I. Sailer (1♀, USNM); Savanna, 22.vii.1947, S. Camera (1♂, CNCI); Urbana, 21.ix.1960, G.P. Waldbauer (1♂, CNCI); Urbana, 29.vii.1940, ex: *Miris dolabratus* [= *Leptopterna dolabrata*], W.V. Balduf (1♀, USNM). **Indiana:** Attica, 7.x.1916, (1♂, USNM); La Fayette, 4-19.x.1915, 2.viii.1915, 1.vi.1917, 26.vi.1922, J.M. Aldrich, E.W. Stafford (13♂9♀, USNM, BMNH); Franklin Co., 27.v.1957, N.L. Currie, R.E. Williams (3♂5♀, USNM); Shelby, 24.v.1914, J.M. Aldrich (1♀, USNM); S. Wanatah, 1.vi.1916, J.M. Aldrich (1♀, USNM); Tippecanoe Co., 19.vi.1956, (1♂, USNM). **Kansas:** Douglas Co., Breidenthal Reserve 15mi SE Lawrence, 30.vi.1979, R.J. McGinley (1♂, USNM); Woodson Co., 9mi S Yates Center, 3.vi.1967, G.F. Hevel (1♂, USNM). **Kentucky:** Bell Co., Capito, 28.v.1965, J.G. Chillcott (1♂, CNCI). **Maine:** Bar Harbor, 11.viii, C.W. Johnson (1♀, USNM); Orono, 10.vi.1913, H.M. Parshley etc. (2♀, CAS, CUIC); Trenton, 1.viii.1930, A.L. Melander (1♀, USNM); Wells, 15-17.viii.1949, A. Stone (1♀, USNM). **Massachusetts:** Athol, 10.ix.1932, A.L. Melander (1♀, USNM); Chicopee, 8.vii.1900, (1♂, USNM); Dorehesler, 29.ix.1899 (2♀, BMNH); Framingham, C.A. Frost (4♂, DEIC); Middlesex Co., Belmont Rock Mdw, 12.vi.1981, N.E. Woodley (1♀, USNM); Mt. Holyoke Gap, 17-22.1914, C.H. Townsend (1♂1♀, USNM); Melrs Hghds, 18.vi.1911 (1♂, CNCI). **Maryland:** Cercil Co., 6mi W Port Deposit, 29.viii.1981, G.F. and J.F. Hevel (1♀, USNM); Beltsville, 28.vi.1917, L.O. Jackson (1♂, USNM); Chesapeake Rch., 2.vii.1924, J.M. Malloch (1♂, USNM); Chesapeake Beach, 18.ix.1914 and 18.ix., C.T. Green and N. Bank (1♂1♀, USNM); College Park, 30.x.1912, W.R. Walton (9♂8♀, USNM); Grove Hill, 16.ix.-2.xi.1916, C.H.T. Townsend (12♂5♀, USNM, BMNH); Laurel, 20.v.1965, (1♀, CNCI); Montgomery Co., Bethesda, 5.vi.1983 and 13.vii.1970, G. Steyskal and J.E. O'Hara (2♂2♀, DEBU); Plummers Islands, 14.vi.1913, 18.v.1902 and 25.viii.1912, W.L. McAtee, H.S. Barber and R.C. Shannon (1♂2♀, USNM). **Michigan:** Agr. Coll., 1.x.1923, (1♂, CNCI); Allegan, 6-2-1926, (1♂, CNCI); Antrim Co., 11.vii.1949, R.R. Dreisbach (1♂, CNCI); Bath, 6.vi.1942, C.W. Sabrosky (1♀, USNM); Bay Co., 2.vi.1940, C.W. Sabrosky (1♂, USNM); Cadillac, 15.vi.1941, C.W. Sabrosky (1♀, USNM); E. Lansing, 18.v.1936, 1.x.1937, 3.x.1939, 27.vi.1940, viii.1948, 3.vi.1942, C.W. Sabrosky (11♂8♀, USNM, BMNH); Eaton Rapids, 30.v.1942, C.W. Sabrosky (1♂, USNM); Fancy Gap, mi 197, 13.vi.1965, J.G. Chillcott (1♂, CNCI); Genesee Co., 16.vii.1939, R.R. Dreisbach (1♂, CNCI); GR. Rapids, 20.vii.1937, (1♀, USNM); Ingham Co., 26.vii.1948 (1♂, USNM); Mainistee, 20.vii.1940 (1♂, USNM); Michigamme, 8.viii.1936, C.W. Sabrosky (2♀, USNM); Midland Co., 15.vi.1948, R.R. Dreisbach (1♂, CNCI); N.E. Osceola Co., 15.vi.1941, C.W. Sabrosky (1♀, USNM); Oabland, 2.vi.1935, (1♂, CNCI); Richmond, 24.x.1915, (1♂, USNM); Sagi-

naw, 8.vii.1941 (1♂, USNM); Turin, 8.viii.1936, C.W. Sabrosky (1♂, USNM). **Minnesota:** Wabasha Co., 7mi SW Wabasha 24.vi.1974, J.R. Powers (1♀, CASC); Winona Co., Elba., 11.vi.1970, J.R. Powers (1♀, CASC); Clay Co., 5.ix.1978, J.R. Powers (1♀, CASC). **Mississippi:** A&M Col., 23.iii.1921, 10-12.xi.1924 and 20.iii.1925, H.W. Allen (2♂2♀, USNM); Washington Co., 4.v.1967, ex: *Lygus lineolaris*, A.L. Scale (1♂1♀, USNM); Waukesha, 13.viii.1951, A.H. Sturtevant (1♀, USNM); Washington Co., 3mi N Leland, 9-13.v.1979, G.C. Steyskal (1♂, USNM). **Missouri:** Boone Co., Columbia, 9.xi.1967, F.D. Parker (1♀, USNM). **Nebraska:** Barber, 23.vi.1914, J.D. Tothill (1♂, USNM); Chamcook, 28.vi. and 1.vii.1965, G.E. Shewell (1♂1♀, CNCI); Fton, 9.viii.1913, J.D. Tothill (1♂, CNCI); McGivney, 12.vii.1931, J.M. Aldrich (1♂2♀, USNM). **New Hampshire:** Franconia, 6-15.viii.1915, C.H. Townsend, Slosson (9♂8♀, USNM); Kingsman Notch, 7.vii.1931, J.M. Aldrich (1♂, USNM); Mt. Wash., 4.vii.1936, A.L. Melander, (1♂1♀, USNM); Noxon Camp, 2,000ft, 5.vii.1931, J.M. Aldrich (2♂2♀, USNM); Randolph, 5.ix.1941, E.L. Bell (1♀, AMNH); Wash. Base Mt., 2,600ft, 1.ix.1914, F. Solidago (4♂1♀, USNM). **New Jersey:** Blaiirstown, 15.vi.1984, ex: *Leptopterna dolabrata*, W.H. Day (1♂, USNM); Burlington Co., 27.iv.1966, ex: *Hypera postica*, W.H. Day (1♂, USNM); Columbus, 19.vi.1963, D.D. Jones (1♀, USNM); Lakehurst, Wrangle Brook Rd., 6.ix.1956, C.B. Knowlton (1♂, CNCI); Lumberton, 5.vi.1963, ex: *Lygus*, D.D. Jones (1♂, USNM); Milltown, (1♂, AMNH); Moorestown, 5.viii.1926, 23.vii. 27.viii.1962, viii.1963, 12.iv.1968, ex: *Lygus lineolaris*, F.A. Streans, H.W. Allen (2♂4♀, USNM); Passaic Co., Bearfort Mts., 30.ix.1965 (1♀, AMNH); Pemberton, 11.vii.1909, 7.vi.1963, D. Jones. (2♀, USNM); Princeton, x.1939, (1♂, AMNH); Riverton, 27.v.1925 and 18.vii.1927, H.C. Hallock (1♂1♀, USNM); Taunton, 3.x.1926, H.W. Allen (1♂, USNM). **New York:** Aurora, 20.vi.1952, A. Stone (1♂, USNM); Auburn, 11.viii-23.ix.1969, D.J. Peckham (26♂, USNM); Buffalo, 10.ix.1909 and 12.vi.1910, M.C. van Duzee (2♀, CASC); Cayuga Co., Sempronius, 2.viii.1979, L.L. Pechuman (1♂, CUIC); Cayuga Co., 16.vii.1921 (1♀, CUIC); Chenango Co., McDonough, 28.vii.1965, L.L. Pechuman (1♂, CUIC); Chestertown, 1958, F.S. Blanton (1♂, CUIC); Chittenango, 8.vi-18.vii, 25.ix.1970, D.J. Peckham (6♂, USNM); Cold Springs Harbour, 3.viii.1927, A.L. Melander (1♂, USNM); Clinton Co., Peru, 10.vi.1916 (1♂, CUIC); Cornell University, 1932, ex: *Lygus pratensis* [= *Lygus lineolaris*], L.L. Hill (1♂1♀, CUIC); Danby, 24.ix.1964, L.L. Pechuman (2♂, CUIC); Elma, 20.viii.1911, M.C. Van Duzee (3♂, CASC); Erie Co., Ton.Ind.Res., 24.vi.1961, L.L. Pechuman (1♂, CUIC); Flushing, 29.v.1932, E. Curran (1♀, AMNH); Genesee Co., 17.vi.1967, R. Lederhouse (3♀, CUIC); Geneva, 28.v.1914, A.L. Melander (1♀, USNM); Geneva, 1920, ex: *Lygus caryae* (1♂, USNM); Grand Is, 10.vii.1921, M.C. van Duzee (1♂, CASC); Hamburg, 6.vi.1909, M.C. van Duzee (1♀, CASC); Honeoye Falls, 18.viii.1915, M.D. Leonard (1♀, USNM); Honeoye Falls, 11.vii.1915, ex: *Miris dolabrata* [= *Leptopterna dolabrata*], M.D. Leonard (1♂, USNM); Ithaca, v, 23.ix., 9.vi.-18.vii.1913 /20/52/64, J.C. Martin, K.V. Krombein, M.D. Leonard (11♂9♀, USNM, CNCI, CUIC); Kalbfleisch Field Research Station, 30.viii. 1964, P.H. Arnaud, Jr. (1♂, CASC); Lewis Co., Tug Hill, 1.viii.1967, L.L.



Pechuman (1♂, CUIC); Long Island, Greenport, 10.viii.1953, R. Latham (1♀, USNM); Long Island, Babylon, 14.ix.1935, 8.vii.1937, F.S. Blanton and Borders (1♂2♀, CNCI, TAMU); Long Island, Dix Hills, 15.vi.1935, Blanton and Borders (1♂, CNCI); Long Island, Farmingdale, 14.vi.1935, Blanton and Borders (1♀, CUIC); Long Island, 24.v.1894, J.L. Labriskie (1♀, AMNH); Long Island, Gold Spring Harbor, 29.vi.1930, C.H. Curran (1♀, AMNH); Ludlowville, 31.vii.1966, L.L. Pechuman (1♀, CUIC); Molean Res., Grass Bog and Sphaerium Brook, 15.v.1924 and 7.ix.1924, (1♂1♀, CUIC); New York City, Central Park, 13.13.1952, S.J. Hessel (1♀, AMNH); Olivera, 12.vii.1931, F.S. Blanton (1♀, CUIC); Oneonta, 24.viii.1935, H.K. Townes (1♂, USNM); Orange Co., 5 mi N W Tuxedo Park, 3.vii.1962 J.G. Rozen etc. (1♂1♀, AMNH); Oswego, 30.v.1896, (1♂, USNM); Poughkeepsie, 25.viii.1936, H.K. Townes (1♂, CNCI); Rensselaer Co., Brainard, 11-12.vii.1966, P. and B. Wygodzinsky (1♂, AMNH); Rochester, 22.x.1933 and 10.x.1909, R.L. Post et al (1♂1♀, CAS, AMNH); Seneca Falls, 10.vii.1955, L.L. Pechuman (1♂, CUIC); Stamford, Ut Sayantha Mt., 12.vii.1964, P. Minacci (2♂, CUIC); Truxton, 12.vii.1928, C.H. Curran (1♂, AMNH); Tompkins Co., Brooktondale, 8.x.1965, L.V. Knutson (1♀, CUIC); Tompkins Co., 24.ix.1964, vii.1967, R. Lederhouse, R.A. Morse (4♂5♀, CUIC); Verona, 1.viii.1963, Stewart and Benton (1♂, CUIC); White Lake, 4.ix.1896, J.L. Labrishic (1♂, AMNH); Wilmington Notch, Adirondacks, 1.vii, J.M. Aldrich (3♂, USNM). **North Carolina:** Highlands, 3-5,000ft, iv.1936, R.C. Shannon (2♂, USNM); Hot Springs, A.T. Slosson (1♂, AMNH); Swain Co., 5mi N. Nantahalalah, 8.vi.1965, J.G. Chillcott (2♂, CNCI); Swain Co., Nantahalalah, 8.vi.1965, J.G. Chillcott (1♂2♀, CNCI); Smokies, Forney Ridge, 18.vii.1941, A.L. Melander (1♀, USNM); Smokemont, 2-20.vii. 1941, A.L. Melander (7♂3♀, USNM). **Ohio:** Amherst, vii.12.1917, 14.viii. 1932, vii-viii.1958, H.J. Reinhard (3♂5♀, CNCI); Columbus, 28.v. 1903, 20-24.x.1901, 17.x.1922, 23.v.1902, 1.x.1925, 28.v.1923, 18.v.1952, J.S. Hine, H.W. Allen, H.V. Weems (10♂4♀, USNM, CNCI); Dayton, (1♂, CUIC); Pike Co., 1.v.1956., ex: *Holcostethus limbolaris*, R.W. Rings (1♂, USNM). **Oklahoma:** Willis, 6-9.vi.1986, D.J. Peckham (2♂2♀, USNM). **Pennsylvania:** Beaver Co., Rt. 168, 6mi SW Darlington, 17.ix.1972, M.A. Carter (5♂4♀, CASC); Butler Co., Moraine St. Pk., 14.vii.1989, S.A. Marshall (1♀, DEBU); Camp Hill, 3.vi.1917, W.S. Fisher (1♂1♀, USNM); Castle Rock, 28.viii.1910 (1♀, USNM); Center Co., State College, 9.vii.1972, 16.vi.1974, D.J. Shetler (2♂1♀, CASC); Centre Co., Pine Grove Mills, 26.ix.1972, D.D. Wilder (2♂, CASC); Columbus, 28.v.1923 (1♂, CNCI); Dauphin Co., Grantville, 24.v.1962, J.G. Chillcott (1♂, CNCI); Dauphin Co., Grantville, 24.v.1962, J.G. Chilcott (3♀, CNCI); Hazleton, 28.ix.1903, Daetz (1♂, USNM); Lehigh Gap, 6.ix.1909 (1♂, USNM); Luzerne Co., Alden, 12.v.1964 and 24.v.1962, J.G. Chillcott (1♂1♀, CNCI); Lycoming Co., Ralston, 8.vi.1962, J.G. Chilcott (4♂2♀, CNCI); Somerset Co., Babcock St. For., 17.vii.1973, D.D. Wilder (1♀, CASC); State College, 6.viii.1949, C.W. Sabrosky (1♂, USNM); University Park, early September, ex: *Philaenus leucophthalmus*, R.C. Newton, (2♂1♀, USNH); Wilawana, 13.vi.1934, R.H. Crandall (1♂, AMNH). **South Carolina:** Clemson, 11.x.1908, C.H.T.

Townsend (1♀, USNM); New Ellenton, 10.v.1978, D.J. Peckham (1♂, USNM). **Tennessee:** Great Smokies National Park, Newfound Gap., 8.vii.1941, A.L. Melander (1♂, USNM). Willamson Co., 15mi S Nashville, 2.v.1994, S.A. Marshall (1♀, DEBU). **Vermont:** East Barre, 19.vii.1935, H.J. Reinhard (1♀, CUIC); Lake Willough, Westmore, 4.viii.1951, L.H. Bruneau (1♀, TAMU); Middlebury, 16.viii.1935, Blanton and Borders (2♀, CUIC); So. Randolph, Hwy.14., 27.vi.1980, B.V. Peterson (1♂, CNCI); Stowe, 17.ix.1933, E.L. Bell (1♂, AMNH). **Virginia:** B.R.P. mi.8, 20.vi.1965, J.G. Chillcott (1♂1♀, CNCI); Clarke Co., 4mi NW Paris, 29.v.1972, D.D. Wilder (1♂, CASC); Davis, Blackwater Fall St. Pk., 2.vii.1986, E.A. Lippert (2♀, DEBU); Difficult Run, 14.ix.1913, C.S. Shannon (1♀, USNM); Falls Church, 20.ix.-17.x.1912, C.T. Greene (38♂12♀, USNM); Four-mile Run, 7.vi.1914, C.T. Greene (1♀, USNM); Giles Co., Bald Knob, 4,350ft, 2.vi.1962, J.G. Chillcott (2♂, CNCI); Giles Co., Mountain lake, 3,600ft, 18.v.1962, J.G. Chillcott (2♂, CNCI); Great Falls, 23.x.1920 and 13.v.1951, R.C. Shannon, J.M. Aldrich, C.W. Sabrosky (4♂4♀, USNM); Loaisa, 16.x.1927, J.M. Aldrich (1♀, USNM); Morrefield (5mi E), 20.vi.1965, J.G. Chillcott (1♂, CNCI); Mt. Varnon, 30.x.1926, N.K. Bigelow (2♀, CNCI); Potomac Cr., 23.v.1896, (2♂1♀, USNM, BMNH); Scott Co., Snowflake, 20.v.1965, J.G. Chillcott (1♂, CNCI); Shenandoah Co., Mt. Jackson, 25.v.1962, J.G. Chillcott (1♀, CNCI); Shenandoah Co., Big Meadow, 3.vii.1939, A.L. Melander (1♂, USNM); Shenandoah Nat. Pk., Thornton Gap, 28.vii.1980 (1♀, BMNH); Skyline, 22.vi.1939, F.S. Flanton (1♂1♀, CUIC); Tazewell Co., Wardell, 20.v.1965, J.G. Chillcott (1♂, CNCI). **Wisconsin:** Dane Co., 10.vi.1933, F. Snyder (2♂, DEIC); Madison, Fall.1956, xi-xii.1956, 19.x.1962, ex: *Lygus lineolaris*, J.T. Medler (2♂4♀, USNM); Naches Rv., 8.vi.1927, M.C. Lane (1♀, USNM); Pullman, 1.v.24, (1♀, USNM); Snake Riv, Opp Clarkston, 3.v.1925, A.L. Melander (2♂, USNM).

## HOSTS

*Adelphocoris lineolatus* (Goeze) (Hemiptera, Miridae): - USA (NJ) (Day 1995: 102)

*Leptopterna dolabrata* (Linnaeus) (Hemiptera, Miridae): - USA (IL, NJ, NY) (Day 1995: 102).

*Lygocoris caryae* (Knight) (Hemiptera, Miridae): - USA (NY) (Arnaud 1978: 59, 60 - Brooks 1945: 666).

*Cosmopepla bimaculata* Thomas (Hemiptera, Miridae): - USA (NY) (Arnaud 1978: 59 - Clance and Pierce 1966: 857).

*Lygus lineolaris* (Palisot de Beauvois) (Hemiptera, Miridae): - USA (AK, NY, NJ, WI, MS, MI, MO), CANADA (ON) (Arnaud 1978: 59, 60 - Clancy and Pierce 1966: 855,857 - Day 1995: 102).

*Holcostethus limbolaris* Stal (Hemiptera, Pentatomidae): - USA (OH) (Arnaud 1978: 60, Clancy and Pierce 1966: 857).

*Megaloceroea recticornis* (Geoffroy) (Hemiptera, Miridae): USA (NJ) (Day 1995: 102).

*Podisus* sp. (Hemiptera, Pentatomidae): - USA (GA) (new record).

*Sinea spinipes* (Herrich-Schaeffer) (Hemiptera, Reduviidae): - USA (GA) (new record).

*Stenotus binotatus* (F.) (Hemiptera, Miridae): -USA (NJ) (Day 1995: 102).

*Trigonotylus coelestialium* (Kirkaldy) (Hemiptera, Miridae): -USA (NJ) (Day 1995: 102).

#### DOUBTFUL HOSTS

*Hypera postica* (Gyllenhal) (Coleoptera, Curculionidae): - USA (NJ).

*Philaenus leucophthalmus* Linnaeus (Homoptera, Cercopidae): - USA (PA).

#### 3.4.16 *Phasia subopaca* (Coquillett, 1897)

(Figures I-61, II-9.3)

*Alophora subopaca* Coquillett, 1897: 47.

*Euphorantha subopaca*: Townsend 1938: 53 - Brooks 1945: 668 (redescription).

*Alophorella subopaca*: Sabrosky and Arnaud 1965: 968 (catalog).

#### DESCRIPTION

Body length: 6-8 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, greyish yellow pruinose, 4-5 rows of hairs laterally. Frontal vitta black. Frontal vitta at base of antennae 0.6-0.7 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial black, yellow pruinose, bare, 1.1-1.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, yellow pruinose. Vibrissa well differentiated; intervibrissal distance 1.2-1.25 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1-1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening about 2.2-2.3 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1 katepisternal seta; 8-11 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured, white with light brown infuscation; petiole of api-

cal cell 0.30-0.35 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 2 *p*, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur brown, upper part black; hairs black. Mid tibia black, with 1 *ad*, 1 *p* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with one row of *ad* and 4-6 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity silvery; longitudinal vitta distinct. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.6. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III silvery (on anterior 1/2-3/5). Pruinosity of tergite IV silvery (on anterior 3/5-4/5); hair spots indistinct. Pruinosity of tergite V evenly silvery; hair spots indistinct. **TERMINALIA.** Syncercus not notched posteriorly; apex slightly bent ventrally. Surstylus straight, not broadened, as long as cercus. Ejaculatory apodeme small, apex with a small hook. Hypandrium broad, slightly shorter than phallapodeme. Epiphallus well developed. Pregonite broad, inner lateral angle pointed. Postgonite broad, outer lateral angle pointed, as long as pregonite. Phallus slender, basal half haired dorsally, 1.6-1.7 times as long as hypandrium. Distiphallus partly sclerotized. Dorsolateral process bent ventrally. Ventrolateral process bent dorsally, longer than dorsolateral process.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus, not touching. Hind tibia with one row of anterior spine-like setae. Sternite VII (sheath) longer than sternite VI, tapered, narrow apically, not bent; apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora subopaca* Coquillett, 1897. Holotype ♂, [USA], New Jersey, Woodbury, 6.7.1896 (USNM, No.3526, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Ontario:** Carleton Co., Richmond (8 km S), 14-20.ix.1983, B.E. Cooper (1♂, CNCI); Ottawa, 10.vi.1942, 6.x.1943 and 20.ix.1947, A. Brooks (2♂1♀, CNCI); Jordan, 2.ix.1914, W.A. Ross (2♂, CNCI). **Quebec:** Aylmer, 28.iv. and 5.x.1924, C.H. Curran (23♂3♀, CNCI, AMNH); Norway Bay, 24.viii.1938, G.E. Shewell (1♂, CNCI). **USA: Illinois:** Chicago, 8.v.1896 (1♂, USNM). **Indiana:** La Fayette, 9.vi and 19.x.1915, J.M. Aldrich (2♀, USNM). **Maryland:** Chesapeake, 17-20.ix.1914, C.T. Greene and R.C. Shannon (9♂6♀, USNM, BMNH); Lakeland, 6.ix.1909, F. Knab (1♂, USNM). **Maine:** Bar Harbor, 2.viii (1♀, USNM). **Massachusetts:** Forest Hills, 27.ix.1913 (1♂, USNM). **Michigan:** E. Lansing, 21.vi.1947 (1♀, KSUC). **New Hampshire:** Gorham, 19.vii.1935 (1♀, CUIC); Sturnis, 11.ix.1955, C.W. Sabrosky (1♂, USNM). **New York:** Buffalo, 10.5.1909, M.C. van Duzee (1♀, CASC); Callicoon, 12.vii. 1937, H. Dietrich (1♀, CUIC); East Aurora, 12.ix.1909, M.C. van Duzee (1♀, CASC); Hamburg, 6.vi.1909, M.C. van Duzee (1♂,

CASC); Hemphis, 3-7.22 (1♀, CUIC); Long Island, Dix Hills, 10.vi.1934, (1♀, CUIC); Long Island, Orient, 4.ix.1953, R. Latham (1♀, USNM); Long Island, Babylon, 6.vi.-23.ix.1933, 19.ix.1934, F.S. Blanton and Borders (3♂6♀, CUIC); Long Island, Riverhead, Greenport and Montauk, 19.vii.1951 and 7.v.-11.vi.1953, R. Latham (3♂, USNM); Patterson, 19.35, H. Dietrich (1♀, CUIC). **New Jersey:** Branchville, 23.v.1931, C.H. Curran (1♂, AMNH); Evesboro, 5.iv.1925, L.B. Parker (1♂1♀, CNCI); Riverton, 12.x. (1♂1♀, USNM). **Ohio:** Amherst, vii.1933, H.J. Reinhard (1♂1♀, CNCI); Columbus, 10.vi.1926, H.W. Allen (1♀, USNM). **Pennsylvania:** Harrisburg, W.R. Walton (1♂1♀, USNM); Highspire, 28.iv. (1♂, USNM). **South Carolina:** Greenville, 15.x.1916 (1♂, USNM). **Tennessee:** Knox Co., 6.x.1956 (1♂, USNM). **Virginia:** Mt. Venum, 30.x.1926, N.K. Bigelow (1♂, CNCI); Rosslyn, 1.v.1913, R.C.Shannon (2♀, USNM); 4mi Run, 11.x.1930, Bridwell (1♀, USNM). **Wisconsin:** Milwaukee (1♀, USNM). **Misc State:** Neotomno, 14.ix.1959, Aster (1♀, USNM).

## HOSTS

*Cosmopepla bimaculata* (Thomas) (Hemiptera, Pentatomidae): - CANADA (ON) (new record).

*Phymata americana* Melin (Hemiptera, Phymatidae): - CANADA (ON) (new record).

### 3.4.17 *Phasia takanoi* (Draber-Moňko, 1965)

(Figures I-63, II-10.3)

*Alophora (Brumtallophora) takanoi* Draber-Moňko, 1965: 147.

*Phasia (Phasia) takanoi*: Herting 1984: 169 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog)

## DESCRIPTION

Body length: 8.5-11 mm

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity, 6-7 rows of hairs laterally (not reaching to eyes). Frontal vitta brown, black. Frontal vitta at base of antennae 1.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial lower part yellow, but upper part brown to black with grey pruinosity; upper part haired; 2.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.9 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown and black with grey pruinosity; hairs white; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 2.1-2.3 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, white and yellow; scale-like hair absent. Anepimeral setae medium size, black; 2 katapisternal setae; 6-9 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white, or white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured, narrow or broad; petiole of apical cell 0.18-0.20 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, with 1-3 *p*, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 1.3 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 8 *ad* and 7 *pd*.

**ABDOMEN.** Abdominal tergites black; strongly shiny; longitudinal vitta absent; outer side of syntergite I+II, tergites III, IV and basal syntergite I+II with grey pruinosity, tergite VI and outer side of tergite V with yellow pruinosity. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots indistinct. **TERMINALIA.** Syncercus slender, with a small notch posteriorly. Surstylus flattened, strongly bent dorsally, longer than cercus. Ejaculatory apodeme slender, knob-like. Hypandrium longer than phallapodeme, but as long as phallus. Epiphallus well developed. Pregonite well developed, apex blunt. Postgonite pointed, bent ventrally. Phallus short, densely haired dorsally. Distiphallus partly sclerized, strongly bent ventrally and hook-like.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes separated by a distance 0.5 times as wide as ocellar triangle, not touching. Anterior spine-like setae of hind tibia present. Tergites with thinly grey pruinosity only. Sternite VII (sheath) longer than sternite VI, tapered, broad apically (spoon-like), bent; apex directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora (Brumptalophora) takanoi* Draber-Moňko, 1965. Holotype ♀, USSR [RUSSIA], Primorskij Kraj, Naturschutzgebiet Sudzuch, Ta Tschingouz, 9.x.1948, Gussakovskij (Zoological Museum, University of Moscow, not examined); allotype, JAPAN, Hokkaido, Yamabe, 27.ix.1961, T. Kumata (ZMPA, not examined).

**OTHER MATERIAL EXAMINED**

**JAPAN.** Honshu, Tochigi, 600m, Shiobara Spa., 25-26.x.1988, H. Kurahashi (2♂26♀, NIHJ); Towada, Takinosawa, 12.x.1969, S. Fukushi (1♂, BLKU); Aomori C., Asamushi, 18.x.1980, S. Fukushi (1♀, BLKU).

**HOST**

Unknown.

**NOTES**

*Phasia takanoi* is an eastern Palaearctic species known from Russia and Japan.

**3.4.18 *Phasia transvaalensis* Sun, sp. nov.**

(Figures I-62.6-10, II-1.1)

**TYPE MATERIAL**

Holotype ♂, [SOUTH AFRICA], Transvaal, Johannesburg, i.1971 (BMNH).

**DESCRIPTION**

Body length: 8.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance almost as wide as ocellar triangle. Fronto-orbital plate black, greyish yellow pruinose, 4-6 rows of hairs laterally. Frontal vitta black, divergent. Frontal vitta at base of antennae 1.6 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black, yellow pruinose. Parafacial black, yellow pruinose, bare, 1.5 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, orange yellow, yellow pruinose. Vibrissa well differentiated; inter-vibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black, greyish yellow pruinose; hairs white; height 0.12 times eye height. Lunule normal; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.2. Length of oral opening 2.4 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and brown. Anepimeral setae medium size, black. 2 katapisternal setae. 12-14 meral setae. Scutellum black; thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicoستا brown. Wing pictured, narrow; petiole of apical cell 0.21-0.22 times as long as pre-

ceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarsus black. Fore claws brown, apex black, 1.1 times as long as fifth tarsomere. Pulvilli broad black. Mid femur black; hairs black. Mid tibia black, apically with 1 *av*, 1 *pv*, 1 *pd* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 8-10 *ad* and 4-6 *pd*.

**ABDOMEN.** Abdominal tergites brown, with wide black longitudinal vitta; pruinosity yellowish silvery. Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Tergites I+II, III pruinose. Tergite IV almost not pruinose; hair spots indistinct. Tergite V silvery pruinose, even. **TERMINALIA.** Syncercus broad, deeply U-notched posteriorly; apex bent ventrally. Surstylus longer than cercus; apex flattened laterally. Ejaculatory apodeme long, apex broadened and flattened. Hypandrium broad, shorter than phallapodeme. Epiphallus indistinct. Pregonite reduced. Postgonite well developed, strongly bent ventrally, not haired. Phallus long and broad, over 2 times as long as hypandrium; haired dorsally on basal 1/4. Distiphallus swollen, not sclerotized.

**FEMALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name is derived from the type locality, Transvaal, South Africa.

#### 3.4.19 *Phasia yunnanica* Sun, sp. nov.

(Figures I-69, II-10.3)

#### TYPE MATERIAL

Holotype ♂, CHINA, Yunnan Province, Lanping, 3,000m, 22.viii. 1984, S. Wang (IZAS).

#### DESCRIPTION

Body length: 8.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance 0.5 times as wide as ocellar triangle. Fronto-orbital plate black, yellow pruinose, 7-8 rows of hairs laterally (not reaching to eyes). Frontal vitta triangular, black. Frontal vitta at base of antennae 1.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial brown and black with grey pruinosity, bare, 3.5 times as wide as first flagellom-



ere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 2/5. Gena black with grey pruinosity; hairs white; height 0.11 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.4 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 2 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly grey pruinose, without longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, white and yellow; scale-like hair absent. Anepimeral setae medium size; black. 1 katepisternal seta. 8-9 meral setae. Scutellum black, thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured, brown, broad; petiole of apical cell 0.18-0.20 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, without bristles, apically with 1 *p*. Fore tarsus flattened; black. Fore claws brown, apex black, 1.3 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 2 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black (with a long, densely anterodorsal bristle area); scale-like setae absent. Hind tibia brown, with 2 *ad* and 6-7 *pd*; hind tarsus with dense golden hairs ventrally.

**ABDOMEN.** Abdominal tergites black, outer side of syntergite I+II and anterior half of tergite III dark yellow; pruinosity present, but thin; longitudinal vitta absent; outer side of syntergite I+II, tergites III, IV with grey pruinosity; tergite VI and outer side of tergite V with golden yellow pruinosity. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1; relative width I+II:III:IV:V = 0.6:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus long, U-notched posteriorly, apex with a pair of saw teeth. Surstylus extremely long, apex broad and strongly arched dorsally. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallapodeme. Epiphallus well developed. Pregonite black, strong, sharply pointed. Postgonite narrow, pointed. Phallus short, as long as hypandrium, not haired. Distiphallus narrow, membranous.

**FEMALE:** Unknown.

## HOST

Unknown.

## ETYMOLOGY

This specific name is derived from the type locality, Yunnan Province, China.

## NOTES

*Phasia yunnanica* can be separated from other species of *Phasia* by the extremely long, arched surstylus and the specific structure of hypandrium complex. The male terminalia of the type is stored in glycerine in a micro vial.

**3.4.20 *Phasia zimini* (Draber-Mońko, 1965)**

(see Draber-Mońko 1965: 172-177, figs. 387-405)

*Alophora (Alophorella) zimini* Draber-Mońko, 1965: 172.

*Phasia (Phasia) zimini*: Herting 1984: 169 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog).

## NOTES

*Phasia zimini* (Draber-Mońko) was described by Draber-Mońko based on 6 males and 1 female from Russia [holotype ♀, Russia, Ferner Osten, from L.S. Zimini's collection, not examined]. Both host and biology are unknown. The female of *Phasia zimini* differs from *Phasia aurulans* (Meigen) in having the ovipositor directed dorsally.

*Phasia zimini* is known only from Russia (Primor'e, Amur, Khabarovsk) (Herting 1984).

**3.5. The *Phasia pusilla* species-group**

The *Phasia pusilla* species-group includes all the species previously placed in the subgenus *Hyalomyia* (*sensu* Herting 1984). Although the group is easily diagnosed as follows, it lacks defining characters and some species in this group are probably more closely related to the *Phasia argentifrons* species-group than to other species of the *Phasia pusilla* species-group.

**Diagnosis:** Head spherical; fronto-orbital plate entirely, not swollen; dorsal facets of eye larger than ventral facets. Parafacial bare; lower margin of face projecting, visible in profile. Thorax black, shining or thinly pruinose; one katepisternal seta. Scutellum black, with two pairs of marginal setae; basicosta brown to black. Wing always hyaline;  $R_{4+5}$  with a long petiole, usually more than 0.25 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at right angle. Abdomen black, subovate, with pruinosity; tergite IV and V with distinct hair spots. Male syncercus notched posteriorly; surstylus longer than cercus; phallus haired.

**Key to species of *Phasia pusilla* species group**

(The males of *Phasia emdeni*, *Phasia faceta*, *Phasia girschneri*, *Phasia noskiewiczzi* and *Phasia siberica* are unknown. Unrevised species (Neotropical) are marked with an asterisk).

1. Hind femur strongly arched ..... \**P. curvipes* (Aldrich, 1934) ♂♀
- Hind femur not arched ..... 2
2. Hind tibia strongly arched, shorter than hind femur; presutural supraalar seta absent; sternite VI of female extremely long, longer than the total length of the previous sternites .  
..... *P. punctigera* (Townsend, 1891) ♂♀
- Hind tibia straight or slightly arched, as long as hind femur; presutural supraalar seta usually present; sternite VI of female shorter than the total length of other sternites... 3
3. Male ..... 4
- Female ..... 12
4. Eyes separated by a distance equal to or greater than the width of ocellar triangle .... 5
- Eyes separated by a distance less than the width of ocellar triangle ..... 7
5. Abdomen slender, tergite IV with 8-10 rows of hairs; body size 6.5- 8.5 mm; Nearctic species ..... *P. robusta* (Brooks, 1945) ♂
- Abdomen spherical, tergite IV with 4-6 rows of hairs; body size 3.0-5.5 mm; Palaearctic or Oriental species ..... 6
6. Syncercus deeply notched posteriorly, almost semi-circular; outer angles rounded; distiphallus with a posterior fan-like lobe, and regular saw teeth.....  
..... *P. indica* (Mesnil, 1953) ♂
- Syncercus shallowly notched posteriorly; outer angle acute; distiphallus with marginal irregular saw teeth ..... *P. mesnili* (Draber-Mońko, 1965) ♂
7. Dorsum of syntergite I+II and tergite III matte black, other tergites silky pruinose (strongly contrasting); eyes separated by a distance equal to the diameter of a single ocellus..... *P. venturii* (Draber-Mońko, 1965) ♂
- Dorsum of tergites not as above; eyes separated by a distance wider than a single ocellus, but narrower than the ocellar triangle ..... 8
8. Dorsum of abdomen with a purple shining area *P. purpurascens* (Townsend, 1891) ♂
- Dorsum of abdomen without purple shining area ..... 9
9. Surstylus ball-like ..... *P. aldrichii* (Townsend, 1891) ♂
- Surstylus flattened, or slender ..... 10
10. Syncercus with posterior notch over 1/2 of length ..... *P. pusilla* (Meigen, 1924) ♂
- Syncercus with posterior notch less than 2/5 of length ..... 11
11. Phallus without fine hairs dorsally ..... *P. truncata* Herting, 1983 ♂
- Phallus with fine hairs dorsally; distiphallus with sclerotized saw teeth .....  
..... *P. pandellei* (Dupuis, 1957) ♂
- As in *P. pandellei* but distiphallus membranous ..... *P. normalis* (Curren, 1927) ♂
12. Sternite VII deeply notched posteriorly ..... 13
- Sternite VII not notched posteriorly ..... 16
13. Sternite VII broad posteriorly in profile, over 1/2 as wide as that of middle ..... 14
- Sternite VII narrow posteriorly in profile, less than 1/3 as wide as that of middle .... 15
14. Sternite VII short and broad in profile ..... *P. truncata* Herting, 1983 ♀

- Sternite VII slender in profile ..... *P. girschneri* (Draber-Mońko, 1965) ♀
- 15. Sternite VII strongly flattened laterally; in ventral view, outer side of posterior half parallel-sided ..... *P. pandellei* (Dupuis, 1957) ♀
- Sternite VII flattened dorsoventrally; in ventral view, narrow at middle, outer side of posterior half arched ..... *P. emdeni* (Draber-Mońko, 1970) ♀
- 16. Sternite VII bent downward posteriorly ..... 17
- Sternite VII straight or bent upward posteriorly ..... 18
- 17. Sternite VII with a median unsclerotized area .....  
..... *P. noskiewiczi* (Draber-Mońko, 1965) ♀
- Sternite VII without a unsclerotized area ..... *P. pusilla* Meigen, 1824 ♀
- 18. Sternite VII arrow-like posteriorly in ventral view; wrinkles ventrally .....  
..... *P. mesnili* (Draber-Mońko, 1965) ♀
- Sternite VII as in *P. mesnili* but smooth ventrally ..... *P. normalis* (Curren, 1927) ♀
- Sternite VII not arrow-like posteriorly in ventral view ..... 19
- 19. Dorsum of syntergite I+II, and most part of tergite III matte shining black; sternite VII abruptly and sharply pointed ..... *P. venturii* (Draber-Mońko, 1965) ♀
- Dorsum of tergites not as above; sternite VII gradually narrowed ..... 20
- 20. Apex of sternite VII beak-like in profile, basal width half of its length; body length 6.8 mm .....  
..... *P. robusta* (Brooks, 1945) ♀
- Apex of sternite VII not beak-like, basal width less than 1/2 of its length; body length 3.5 mm ..... 21
- 21. Frontal vitta 6.5 times as wide as fronto-orbital plate anteriorly at level of antenna base .....  
..... *P. faceta* Sun, new species ♀
- Frontal vitta less than 4 times as wide as fronto-orbital plate anteriorly at level of antenna base ..... 22
- 22. Sternite VII with distinct micro spines ventrally in posterior 3/5, tubular in ventral view .....  
..... *P. indica* (Mesnil, 1953) ♀
- Sternite VII with indistinct spines ventrally, tower-like in ventral view ..... 23
- 23. Abdomen greyish white pruinose, hair spots indistinct; abdomen spherical, sternite VII short .....  
..... *P. aldrichii* (Townsend, 1891) ♀
- Abdomen greyish yellow pruinose; hair spots very distinct, sternite VII long ..... 24
- 24. Frontal vitta at base of antennae 2.1 times as wide as fronto-orbital plate anteriorly; Palaearctic species ..... *P. siberica* Sun, new species ♀
- Frontal vitta less than 1.5 times as wide as fronto-orbital plate anteriorly; Nearctic species .....  
..... *P. purpurascens* (Townsend, 1891) ♀

### 3.5.1 *Phasia aldrichii* (Townsend, 1891)

(Figure I-5, II-4.4)

*Hyalomyia aldrichii* Townsend, 1891: 136.

*Hyalomyia celer* Townsend, 1895: 65 (misident).

- Phorantha pruinosa* Robertson, 1901: 284.  
*Phasia cara* West, 1925: 123.  
*Hyalomyiopsis aldrichi*: - Brooks 1945: 677 (redescription).  
*Hyalomya aldrichii*: - Sabrosky and Arnaud 1965: 968 (catalog).  
*Alophora karczewskii* Draber-Moňko, 1965: 105, **syn. nov.**  
*Hyalomya aldrichi*: - Guimarães 1971: 13 (catalog).  
*Hyalomya aldrichii*: - Arnaud 1978: 4 (host catalog).  
*Phasia (Hyalomyia) karczewskii*: - Herting 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog) - Ziegler 1994: 159 (revision).

## DESCRIPTION

Body length: 3-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance almost as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta at base of antennae 1.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae present. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.3-1.4 times distance between vibrissa and eye on same side; facial ridge with bristles 1-3. Gena black with grey pruinosity; hairs black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.4-1.5 times as long as pedicel; arista thickened on basal 0.25-0.3. Length of oral opening 2.0 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum thinly pruinose, without longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 1-2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1 katepisternal seta; 3-6 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base always without scale-like setae. Tegula brown to black. Basicosta brown to black. Wing hyaline, narrow; petiole of apical cell 0.5 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown to black. **LEGS.** Fore femur brown to black; hairs black. Fore tibia brown to black, without bristles, apically with 1 *a* and 1 *v*. Fore tarus black. Fore claws brown, apex black, 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; hairs black. Mid tibia brown to black, apically with 1 *pv* and 1 *pd*. Hind femur brown to black; hairs black; scale-like setae absent. Hind tibia black, slightly arched.

**ABDOMEN.** Abdominal tergites black; pruinosity silvery; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:0.9:0.6. Syntergite I+II shiny, not pruinose. Pruinosity of terg-

ite III present. Pruinosity of tergite IV present on posterior 5/6-6/7; hair spots distinct. Pruinosity of tergite V present; hair spots distinct. **TERMINALIA.** Syncercus broad, with a deep and wide notch posteriorly. Surstylus ball-like, longer than cercus; slightly bent upward. Ejaculatory apodeme small, and knob-like. Hypandrium longer than phallopodeme. Pregonite pointed, shorter than postgonite, with sparse hairs dorsally. Phallus 1.2-1.4 times as long as hypandrium. Basiphallus with fine hairs dorsally. Distiphallus partly sclerotized, with several rows of irregular saw teeth apically.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes separated by a distance as wide as ocellar triangle; not touching. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) slightly longer than sternite VI, tapered, narrow apically, not bent, apex straight, smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia aldrichii* Townsend, 1891. Holotype ♂, [USA], South Dakota, no. 39, (USNM, examined); cotype, 1♀, [USA], South Dakota, no.39 (SEMC, examined).

*Phasia cara* West, 1925. Holotype ♂, [USA], New York, Karner, 4.x.1904, "N.Y.S.Coll. No. 1859" (CUIC, examined); paratypes, 1♂, [USA], New York, Ithaca, 17.vii.1900, L.S. West (CUIC, examined); 1♂, Karner, 4.xi.1914 (CUIC, examined).

*Alophora karczewskii* Draber-Mońko, 1965. Paratypes, 1♂, MONGOLIA, Songina, 24 Km SW Ulan Bator, 22.v.1962, R. Bielawski and B. Pisarski (ZMPA, examined); 1♀, MONGOLIA, Zaisan /1,400m, ad Ulan Bator, 12.vi.1962, R. Bielawski and B. Pisarski (ZMPA, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Alberta:** Banff Natl. Pk., 6.vii.1955, J.R. McGillis (1♂, CNCI); Banff, 24.vi.1925, O. Bryant (1♂1♀, CASC); Waterton, 8.vi.1962, K.C. Herrmann (1♂, CNCI); Lancaster Park, 28.vii.1963, J.R. Vockeroth (1♂, CNCI). Brooks, 13.vi.1957, M. Brooks (1♂1♀, CNCI). Calgary, 31.v.1924. O. Bryant (2♂, CASC); Cameron L. Rd., Waterton Nat. Pk., 19.viii.1961, B.H. Poole (1♀, CNCI); Chin, 7.vii.1956, E.E. Sterns (2♀, CNCI); Eisenhower Jct.B.N. Pk., 14.vii.1962, K.C. Herrmann (1♀, CNCI); Elkwater Park, 29.v.1952, L.A. Konotopetz (3♂2♀, CNCI); Fairview, 30.vii.1982, E. Lippert (2♂2♀, DEBU, USNM); Haynes, 11.vii.1956, O. Peck (1♀, CNCI); Irvine, 11.vi.1952, A.R. Brooks and L.A. Konotopetz (1♂2♀, CNCI); Jenner, 16.viii.1980, S.A. Marshall (1♂, DEBU); Kannanaskis, 23.vi.1925, O. Bryant (2♀, USNM); Lancaster Park, 28.vii.1963, J.R. Vockeroth (1♂, CNCI); Lethbridge, 21.vi.-7.vii.1956, O. Peck and E.E. Sterns (35♂22♀, CNCI); Lethridge, 29.vi, W. Carter (1♀, DEIC); McMurray, 14.vii.1953, W.J. Brown (2♂, CNCI); Morinville, 20.vi.-3.viii.1984, G.C.D. Griffiths (2♂1♀, CNCI); Medicine Hat, x.1911 and 16.vii.1956, J.R. Malloch and O. Peck (5♂2♀, USNM, CNCI); Medicine, 21.vi.1928, F.S. Carr (1♂, AMNH); Munson, 7.viii.1948, Belleville (1♂5♀, CNCI); Onefour, 7.vi.1955 and 31.v.1956, O. Peck and J.R. Vockeroth (2♂1♀, CNCI); Orion,

6.vi.1955, J.R. Vockeroth (1♀, CNCI); Orkney District, 4.viii.1930, G.F. Manson (1♂, CNCI); Scandia, 9-11.vii.1956, O. Peck (2♀1♂, CNCI); Slave Lake, 17.viii.1924, O. Bryant (2♂, CASC); Vauxhall (S.), 18.vii.1950 (6♂, CNCI); Walsh, 3.v.1946, C.L. Neilson (1♂1♀, CNCI); Writing on Stone Sand Pit, 14.vi.1982, D.B. McCoquodale, (1♂, DEBU). **British-Columbia:** Cathedral Mtn., Cathedral Glacier, 23.viii.1955, R. Coyles (1♂, CNCI); Hatzic, 30.vii.1953, W.R.M. Mason (1♀, CNCI); Keremeos, 19.vii.1910 (1♂, USNM); Osoyoos (7mi W), Richter Pass Rd., 5.vi.1958, H and A. Howden (1♂, CNCI); Oliver, 18.viii.-1.ix. 1953 and 20.v.1959, J.R. McGillis and R.E. Leech, (1♂3♀, CNCI); Robson, 12.ix.1949, H.R. Foxlee (1♂, CNCI); Summerland, 15.ix.1930, A.A. Dennys (1♂2♀, CNCI); Vernon, 1.viii.1947, H.B. Leech (3♂, CASC); Westbank, 25.viii.1955, W.L. Wilson (1♀, CNCI). [?] S. ver, 12.viii.1917, (1♂, USNM). **Manitoba:** Aweme, 2.x.1915, N. Criddle (1♀, USNM); Brandon, 1.vii-6.viii.1958, R.L. Hurley, J.G. Chillcott and C.D.F. Miller (3♂, CNCI); Minnedosa (5mi N), 8.vii.1958, C.D.F. Miller (1♀, CNCI); Ninette, 30-31.v.1958, C.D.F. Miller (11♂4♀, CNCI); Shilo (3-5mi SW), 30.vi-13.viii.1958, J.G. Chillcott, C.D.F. Miller and R. Hurley (7♂6♀, CNCI); Treesband, 5.vii.1915, N. Griddle (1♂2♀, USNM, CNCI); Whitewater (4mi N), 22.vi.-17.vii.1958, J.G. Chillcott and J.F. McAlpine (2♂3♀, CNCI). **Northwest Territories:** Hay River, 28.vi-12,15.vii. 1951, P.R. Ehrlich (3♂1♀, CNCI); **Ontario:** Ottawa, 18.viii.1914, G. Beaulieu (1♀, AMNH); Ottawa, Mer Bleu, 2.vi.1966 (1♀, CNCI); **Saskatchewan:** Bateman and Cadillac, 12.vii.1946, Belleville (2♀, CNCI); Birch Hills, 16.vii.1925, K.M. King (1♂, CNCI); Dunblaine, 10.ix.1959, J.R. Vockeroth (1♀, CNCI); Elbow, 28.vii-2.viii.1951, A.R. Brooks and L.A. Konotopetz (7♂3♀, CNCI); Fish Greek, 18.vii.1925, K.M. King (1♀, CNCI); Indian Head, 18.viii.1926, E. Hearle (1♂, BMNH); Nipawin, 2.vi.1948, J.R. Vockeroth (1♀, CNCI); Saskatoon, 5.ix.1923, 29.vii-30.ix.1924, 25.viii.1931, 9.v.-28.vi.1949 and 9.ix.1959, A.R. Brooks, K.M. King and J.R. Vockeroth (20♂16♀, CNCI); Strongfield, 10.ix.1959, J.R. Vockeroth (4♂, CNCI); Swift Current. 1.vii.1945, Belleville (1♂, CNCI); Val Marie, 9.vi.1955, J.R. Vockeroth (5♂4♀, CNCI); White Fox, 3.vii.1944, O. Peck (1♀, CNCI). **USA. Alaska:** Skagway, 3.vi.1921, J.M. Aldrich (1♀, USNM). **Arizona:** 18 mi S (?), 12.v.1948, G.B. Card (1♂, CASC); Ajo (30mi E), 24.iv.1947, A.L. Melander (3♂, USNM); Apache Co., Rt. 666 Mt., at Alpine Summit, 15.ix.1970, P.S. Bartholomen (1♀, CASC); Baboquivaris, 26.iv.1941, A.L. Melander (1♀, USNM); Bill Williams, Fork, Aug, F.H. Snow (1♀, BMNH); Chiricahua Mts., Rustler Pk., 25.vi.1953, W.W. Wirth (1♀, USNM); Graham Co., 24 km W on Hwy 366 from Hwy 666, 1,160m, 27-28.v.1991, malaise trap, J.E. O'Hara (6♂19♀, CNCI); Cochise Co., Sierra Vista (12km S), Ramsey Cyn., 1,700m, 19-26.xi.1986 (1♂1♀, CNCI); Cochise Co., Turkey Ck., Cn., 24.iii.1967, D.M. Wood (1♀, CNCI); Cochise Co., S.W.R.S., Portal (5mi W), 5,400ft, 20-23.iv.1956, 15.ii.1961, 3.ii.1963 and 1.xi-10.xii.1962, M.A. Cazier, E. Ordway and V. Roth (8♂8♀, AMNH); Cochise Co., Elfrida (7mi N), 3.viii.1961, E.G. Linsley (4♂1♀, AMNH); Cochise Co., Rustler Park, 22.x.1964, P.H. Arnaud, Jr. (2♂3♀, CASC); Cochise Co., Portal (2mi NE), 30.vii.5. viii.1959, M. Statham (3♂6♀, AMNH); Coconino Co.,

Cameron (17mi NW), Hwy 64, 11.vi. 1963, D.C. and K.A. Rentz (1♂, CASC); Coconino Co., NW Flagstaff (7.5mi NW), 16.vi.1964, R.W. Poole (1♀, CUC); Coconino Co., Sunset Crater Nat. Mon.(2km W), 2,100m, 22-23.viii.1982, J.E. O'Hara (1♀, DEBU); Coconino Williams, 11.vii.1963, N.L.H. Krauss (1♀, USNM); Eastern Tombstone, 5.xi.1955. G.D. Butler (1♂, TAMU); Parker, 3.iv.1956, F. Werner-G. Butler (1♂, TAMU); Phoenix, 21.iv.1933, R.H. Crandal (2♂1♀, AMNH); Pima Co., Sta Catalina Mts., Sabino Cyn., 6.vi.1952 (1♂, AMNH); Pima Co., Silver Bell Bajada, J.L. Noff (1♂, CASC); Pinery Canyon, 1.vii.1919, A. Wetmore (1♂, USNM); Portal SW Res. Stn., 8.v.1967, D.M. Wood (2♂2♀, CNCI); Portal (4mi E), 8.vi.1968, A. S. Menke (16♂,USNM); Quitobaquito, 18.iv.1947, A.L. Melander (1♂, USNM); Santa Cruz Co., Santa Rita Mountains, Coronado National Forest, B.J. Sinclair (1♂, CNCI); Sahuarita, 14.vi.1955, G.D. Butler (2♂, TAMU); Sierra Vista(15mi S), Ramsey Cyn., Huachuca Mts., 5,200ft, 31.iv-7.iv.1967, R.F. Sternitzky (51♂19♀, CNCI); Tempe, 9.vi.1955, G. Bulter (1♀, TAMU); Tempe, 19-24.vi.1917, J.M. Aldrich (1♂, USNM); Tucson, 25.v. and 13.vi. 1955, G.D. Butler (2♂, TAMU); Welton, 5-6.v.1918, J.C. Bradley (3♀, CUC); **California:** Alameda Co., Sycamore Grove State Pk., and Newark, 3.iii.1931 and 29.vii.1984, W.J. Pulawski and E.P. van Duzee (2♂3♀, CASC); Apple Valley, 8-19.v.1955, W.R. Richards and W.R.M. Mason (2♂, CNCI); Auburn, 29.xi.1937, (1♀, USNM); Azusa Canyon, 18.ix.1944, A.L. Melander (1♀, USNM); Banning 12.v.1938 (1♂3♀, USNM); Buena Park, 23.xii.1944, A.L. Melander (4♂2♀, USNM); Beaumont, 25.iv.1944, A.L. Melander (1♀, USNM); Borrego Desert, Clark Lake, 8.xi.1945, A.L. Melander (2♀, USNM); Santa Barbara Co., Solyang Sta.(2mi E), 28.vi.1962, J.R. Stephenson (1♂, CASC); Iuepenial Co., Nelopaud, 27.iv.1977 (2♂, BMNH); Humboldt Co., 10.v.1911 (1♀, DEIC); Gavilan Hills, 1.x.1952, A.L. Melander (2♂1♀, USNM); Santa Barbara Co., San Marcos Pass(1mi NE), 1,500ft, and Solvang(2mi E), 7.vii.1965 and 28.vi.1965, J.R. Stephenson (2♀, CASC); Berkeley, 17.x.1906, J.C. Bradley (3♂1♀, CUIC); Butte Co., Yankee Hill, 8.v.1928, H.H. Keifer (1♂, CASC); Camp Angelus(4mi S), San Bernardino Mts., 5,000ft, H.F. Howden (2♀, CNCI); Contra Costa Co., Lower Sherman Is. and Antioch, and 2mi. S Curry Creek Park, 20.vii.1935, 7.x.1967, 14.ix.1968 and 13.v.1977, T.W. Davies, D.D. Wilder and E.P. van Duzee (8♂3♀, CASC); Contra Costa Co., Pittsburg, 19.ix.1957 (2♀, CASC); Campbell, 6.v.1934, L.S. Slevin (1♀, CASC); Camp Angelus, 19.ix.1954, A.L. Melander (1♂1♀, USNM); Calaveras Co., Milton, 21.x.1917, J.C. Bradley (3♂4♀, CUIC); Clarksburg, 5.x.1947, R. Coleman (1♀, USNM); Claremont, Baker (1♀, USNM); Claremont, (7♂3♀, USNM); Cajon Pass, 2.vii.1940, A.L. Melander (1♀, USNM); Elsinore, 6.vii.1945, A.L. Melander (1♂1♀, USNM); Elsinore Lake, 28.iii.1935, A.L. Melander (2♀, USNM); Fresno Co., Mendota, 25.iv.1932, E.P. van Duzee (1♀, CASC); Gavilan Hills, 1.x.1952, A.L. Melander (6♂8♀, USNM); Imperial Co., Calexico (15mi E), 5-6.vi.1961, H.F. Howden (1♀, CNCI, light trap ?); Imperial Co., Pinto Wash., 5.v.1958 (1♀, CASC); Inyo Co., Independence, 10.vi.1937, (1♂, AMNH); Joshua Tree N Mon., 22.iv.1959, A. L. Melander (1♂, USNM); Los Banos, 22.v.1918, E.P. van Duzee (1♀, CASC); Los Angeles Co., (3♂3♀, USNM); Lassen Co., S



End, Eagle Lake, 26.viii.1963, H.B. Leech (1♂, CASC); Marin Co., Novato and Lucas Valley and Mill Valley, 10.viii.1963 and 30.ix.1968, P.H. Arnaud, Jr. and E.L. Kessel (2♂1♀, CASC); Monterey Co., 8.vii.1896, W.M. Wheeler (2♀, AMNH); Monterey Co., Bradley, 22.v.1920, E.P. van Duzee (1♂, CASC); Monterey Co., N Foot Laureles, Grad at Robley Rd., 27.xi.1966, H.B. Leech (9♂7♀, CASC); Monterey Co., Los Oadres Nat. For., 22.v.1977, D.E. Willder (2♂2♀, CASC); Marin Co., Pt. Reyes, 5.vi.1949, (1♀, USNM); Muir Woods, 30.viii.1908, J.C. Bradley (1♀, CUIC); Modesto, 20.ix.1939, C.T. York (5♂3♀, USNM); Mill Greek, nr. Igo's, 6.x.1946, A.L. Melander (1♀, USNM); Niles, 5.ix.1932, A. Michelbacher (1♀, USNM); Newberry, 14.iv.1955, W.R.M. Mason (1♀, CNCI); San Luis Obispo, 24.iv.1919, E.P. van Duzee (2♀, CASC); Oak Grove, 4.xi.1945, A.L. Melander (1♀, USNM); Ortaga Hiway, 19.x.1944 and 6.x.1952, A.L. Melander (3♀, USNM); Pacific Grove, 10.v.1906 (1♂, USNM); Palm Spring, 18.xi.1943, A.L. Melander (2♀, USNM); Pasadena, (1♂3♀, USNM); Pleasanton, 24.vi-12.vii.1932, A. Michebacher (1♂1♀, USNM); Pt. Reyes, 10.ix.1906 (1♀, CUIC); Qual Spr., 5.x.1934, A.L. Melander (1♀, USNM); Riverside Co., Hemet L., 4,500ft, 13.iv.1961, J.G. Chillcott (2♂4♀, CNCI); Riverside, 11.vi.1927, 23.x.1953, 2.iv.1944 and 17.iii.1935, Simonds and A.L. Melander (6♂4♀, USNM); Redding(25mi N), 10.vi.1931, H.A. Scullen (1♀, USNM); San Diego Co., Palomar Observatory Cpgd. and Borrego Springs, 26.vi.1968, 20.iv.1977 and 17.iv.1985, P.H. Arnaud, Jr. and W.J. Palawski (3♂1♀, CAS, BMNH); San Mateo Co., 1969, A.R. Moldenke (2♂, CASC); Santa Clara Co., Stanford Univ., 5.x.1957, P.H. Arnaud, Jr. (4♂4♀, CASC); Santa Clara Co., Baker (3♂1♀, USNM); Santa Clara Co., 1902, Coleman (1♀, USNM); Sisykiyou Co., McBride Spg., 8.viii.1967, 1,524m, P.H. Arnaud Jr., (1♀, CASC); Shafter, 28.v.-4.vi.1936, G.E. Behart (2♂, CASC); San Bernardino Co., 12.ix.1967, J. Wilcox (1♂, CASC); Sacramento Co., Citrus Heights, 27.iv.1967 (1♂, CASC); Santa Barbara Co., vic. Buellton, 12.ix.1958, P.H. Arnaud, Jr. (1♂, CASC); White Water, Snow Greek, 1,500ft, 29.iv.1955, W.R. Richards (1♂, CNCI); Stockton, 20.viii.1919, E.P. van Duzee (1♀, CASC); Sugarloaf Mt., 6.vii.1954, A.L. Melander (1♂1♀, USNM); 1000 Springs, 31.viii.1953, A.L. Melander (1♂1♀, USNM); San Francisco, 20.x.1919, E.P. Van Duzee (1♂, CASC); San Francisco, Ingie Side, 14.x.1906 (1♀, CUIC); Tracy, 27.ii-1.iii.1941, 31.x.1940, G.T. York (6♀, USNM); Tulare Co., Porterville, 19.viii.1962, E.E. Ball, Jr. (1♀, CASC); Tuolumne, Strawberry (10mi NE), 17.vii.1961 (1♂, AMNH); Up Sta. Ana. Riv., 15.vii.1948, 1.viii. 1953 and 19.ix.1955, A.L. Melander (3♂4♀, USNM); Veroemont, 1.v.1946, A.L. Melander (2♂, USNM); Ventura Co., Wagon Rd., 4-5.vii.1968 and 14.iii.1977, P.H. Arnaud, Jr. (9♂2♀, CAS, BMNH); Wilton, 22.ix.1920, C.M. Packard (1♀, USNM); Warner Springs (20mi S.), 5.iv. 1967, D.M. Wood (1♂1♀, CNCI); Yucaipa, 1.iv.1938, L.D. Christerson (2♀, USNM); Yolo Co., Davis, 27.ix.1970, D. Dunbar (1♂, CASC); Boulder, 7-12.viii.1919, 30.v.-9.viii.1961 and 5.viii.1973, D.D. Wider, J.R. Stainer, C.H. Mann, B.H. Poole and W.R.M. Mason (13♂38♀, CNCI, AMNH, CASC); Boulder, Valmont Butte, 5,300ft, 9.viii.1961, J.R. Stainer (1♂, CNCI); Brighton, 23.vii.1939, G.A. Sandhouse (1♂, USNM); Buena Vista,

7,800ft, 22-23.vi.1961, C.H. Mann (1♂1♀, CNCI); Cameron Pass, 19.viii.1940, C.W. Sabrosky (2♀, USNM); Clear Creek Co., Chicago Cr., 8,800ft, 2.viii.1961, S.M. Clark (1♀, CNCI); Custer Co., 10mi SW Wetmore, 8.viii.1973, G.F. and S. Hevel (1♀, USNM): Denver, 3.ix.1915 and 19.ix.1914, E.C. Jackson (2♂, USNM); Doolittle Ranch, Mt. Evans, 9,800ft, 8.vii-12.viii.1961, J.R. Stainer, C.H. Mann, S.M. Clark and B.H. Poole (8♂23♀, CNCI); Eagle Co., 17.viii.1959, N. Marston (1♀, KSUC); El Paso Co., 15.viii.1959, N. Marston (2♂, KSUC); Evergreen, 22.viii.1943, M.T. James (1♀, USNM); Florissant Fossil Beds, 8.viii.1973, D. Shetlar and D. Wilder (1♀, CASC); Fremont Co., Union City, 27-29.v.1987, G.F. and J.F. Hevel (1♂, USNM); Fremont Co., Union City, (2♀, USNM); Fort Collins, 21.iv. 1958 (2♀, KSUC); Fort Collins, 17.vi.1920, 19.viii.1906 and 11.viii.1934, L.A. Titus and C.W. Sabrosky (4♀, USNM); Glenwood Spgs., 5,800ft, 22-29.vii.1919 and 5.viii.1920 (2♂1♀, AMNH); Golden, 17.vi.1940, A.L. Melander (1♂3♀, USNM); Grant, 20.viii.1914, 10,000ft, E.C. Jackson (1♂, USNM); Gunnison Co., Cottonwood Pass, 29.vii. 1961, 12,100ft, B.H. Poole (1♀, CNCI); Idaho Springs, 8,600ft, 27.vii.1961, C.H. Mann (1♂, CNCI); Jim Creek and White Rock, near Boulder, 13.viii.1919 and 21-23.vii.1922 (1♂1♀, AMNH); Lake Co., Independence Pass, 12,100ft, 31.vii.1961, J.G. Whillcott (1♀, CNCI); Larimer Co., Estes Park, 7,500ft, 14.viii.1961 and 8.viii.1974, B.H. Poole and M. and T.M. Favreau (1♂1♀, CNCI, AMNH); Larimer Co., 9-17.viii.1955, N. Marston (3♂6♀, KSUC); Loveland Pass, W Slope, 9,850ft, 8.viii.1961, B.H. Poole (1♂, CNCI); Meeker, 6,200ft, 20-21.vii.1919 (1♀, AMNH); Mineral Co., Wolf Creek Pass, 10,850ft, 15.viii.1983, P.H. Arnaud, Jr. (2♂, CASC); Mt. Evans, Summit Lake, 12,800ft, 10.vii.1961, W.R.M. Mason (1♂, CNCI); Mt. Vernon Cn., nr. Golder, 31.vii.1961, 7,200ft, C.H. Mann (1♀, CNCI); Mt. Evans, Doolittle Ranch, 9800ft, 12.vii.1961, Mann (1♀, CNCI); Nederland, 8,500ft, 18.vi.-5.vii.1961, B.H. Poole, J.G. Chillcott and C.H. Mann (1♂9♀, CNCI); Niwot Ridge, nr. Ward, 11,500ft, 3-4.vii.1961, S.M. Clark and W.R.M. Mason, C.H. Mann (3♀, CNCI); Park Co., 16.viii.1959, N. Marston (1♀, KSUC); Pingree Park., 16-23.viii.1924 and 17.viii.1934, C.L. Fluke and C.W. Sabrosky (2♂2♀, USNM); Pleasani Vally, 16.viii.1958, N. Marston (1♂1♀, KSUC); Poncha Springs, 7,500ft, 22.vi.1961, W.R.M. Mason (2♀, CNCI). Prowers Co., 7.vi.1962, N. Marston (1♀, KSUC); Sandhills, Keenesburg, 11.vi.1961, B.H. Poole (1♀, CNCI); Teller Co., 21.viii.1959, N. Marston (1♀, KSUC); Teller Co., Mt. Evans, 10,600- 13,200ft, 10-26.vii.-7.viii.1961. W.R.M. Mason, J.G.Chillcott, S.M.Clark, C.H.Mann and B.H. Poole (5?25?, CNCI); Tenn Pass, 10,300ft, 30.vii-2.viii.1919 (1♀, AMNH); [?], (1♂, USNM). **District of Columbia:** Eastern Bearch., 22.x.1914, R.C. Shannon (5♂1♀, USNM, BMNH). **Georgia:** Rabun Co., Satolah, 2,500ft, 7.vii.1957, W.R.M. Mason (1♂, CNCI). **Idaho:** Adelaide, Medium Rank, 26.viii.1927, host: *S. pestifer* (2♂, USNM); Berger, 5.vi.1931, D.E. Fox, (2♂, USNM); Blackfoot, 6.viii.1931, D.E. Fox, host *Beta vulgaris*, (1♂, USNM); Burley, 9.vii and 2.ix.1930, 5.vi.1931, 10.vi.1932, D.E. Fox, host: *S. pestifer* and *N. altissima*, (7♂9♀, USNM); Burley Idaho, 7-6-1931, R.H. Beamer (1♂, TAMU); Carey, 12.ix.1936, C.F. Henderson (1♂, USNM); Castleford, 2.viii.1928, host: *S. sophia* (1♀, USNM); Coeur

d'Alene, Echo Bay, 3.viii.1924, A.L. Melander (4♂1♀, USNM); Eastern Idaho, 2.vi.1931 (1♂, USNM); Evansville, 7.v.1914, J.M. Aldrich (1♀, USNM); Filer, 31.vii.1931, H. Waters, host: *Beta vulgaris* (1♀, USNM); Franklin, 17.vii.1937, G.F. Knowlton (1♀, DEIC); Hagerman, 3.vi.1930 and 9.ix-9.x.1930, host: *N.altissima* and *S. pestifer*, (4♀, USNM); Hansen, 4.vi.1930, 14.ix-9.x.1930 and 30.viii.1932, D.E. Fox, host *S. sophia*, *N. altissima* and *S. pestifer* (3♂7♀, USNM); Hollister, 7.ix.1927, 21.viii-5.ix.1930, 1.v.-1.x.1931 and 9-26.ix.1932, D.E. Fox, host: *S. pestifer* and *A.rosea*, (28♂18♀, USNM); Juliaelta, 5.vi.1930, J.M. Aldrich (1♂, USNM); Kimama, 20.vi and 12.ix.1930, host: *S. pestifer* and *N. altissima* (8♂4♀, USNM); Kinghill, 24.ix.1936, C.F. Henderson (1♂, USNM); Milner, iv-x.1930, host: *S.pestifer* and *N. altissima*, (1♂3♀, USNM); Moscow, 1.ix.1908, 20-31.viii.1910 and 23.vii-3.ix.1939, T.A. Brindley and J.M. Aldrich (16♂17♀, USNM); Murtaugh, 14.vi and 23.vii.1930, host *S. pestifer*, *S. sophia* and *N. altissima*, (5♂2♀, USNM); Oakley, 8.vi.1930 and 3.ix.1931, D.E. Fox, host: *S. pestifer*, (1♂1♀, USNM); Oneida, Twin Springs, 8.ix.1971, G.F. Knowlton (2♂1♀, BMNH); Osgood, 17.ix.1931, D.E. Fox, host *Beta vulgaris*, (1♂, USNM); Preston, 17.vii.1922, E.P. Duzee (2♂, CASC); Preston, 17.vii.1937, G.F. Knowlton (1♀, DEIC); Rupert, 14.viii.1930, host: *S. pestifer*, (1♂1♀, USNM); Sand Point, 27.vii.1918, A.L. Melander (1♀, USNM); Tuttle, 8.ix.1931 and 30.v.1934, Harries and Fox, host: *S. Parviflora* (2♂3♀, USNM); Twin Falls, 4.viii.1929, H. Waters (1♂, USNM); Waha, 12.viii.1923, A.L.Melander (1♀, USNM); Wendell, 8.ix.1931, D.E. Fox, host *S. pestifer*, (1♂1♀, USNM); Yale, 23.viii.1936, (1♀, USNM). **Indiana:** La Fayette, 30.iv.1915 and 22-23.x, J.M. Aldrich (9♂12♀, USNM, CNCI); Michigan City, 29.vi.1915, J.M. Aldrich (1♂2♀, USNM). **Iowa:** Sioux City, 1.ix.1938 and 7.vi.1938, C.N. Ainslie (2♂2♀, AMNH). **Kansas:** Garden City, 11.vii.1913, F.B. Milliken, host: *Nygus angustatus*, (2♂4♀, USNM); Lawrence, Nat. Hist. Res., 26.v.1956, J.G. Chillcott (3♂2♀, CNCI); Medora, 17.iv., C.W. Sabrosky (1♀, USNM); Manhattan, 29.ix.1934 and 14.iv.1974, C.W. Sabrosky (1♂9♀, USNM, BMNH); Manhattan, 26.v.1925, R.C. Smith (1♂4♀, KSUC); Manhattan, 26.v.1940, R. Schwitzgebel Coll., From *Vernonia interior* Sm. (1♂, KSUC); Marquette, 29.iv.1934 (1♀, USNM); Pottawatomie Co., 4.vii.1936, R.H. Painter (1♀, KSUC). **Massachusetts:** Forest Hills, 27.ix.1923 (1♂, USNM). **Maryland:** near Plummers Id, 23.v.1914 (1♂,USNM). **Michigan:** E. Lansing, 2.x.1941, C.W. Sabrosky (1♀, USNM). **Mississippi:** Agr. Col., 4-9.1922 (1♂, TAMU). Dorcheoter, 29.ix.1899 (1♂, BMNH). **Missouri:** Miller Co., Iberia, 16.viii.1964, A.R. Moldenke (5♂3♀, AMNH). **Montana:** Baird, 31.vii.1923, A.L. Melander (6♂4♀, USNM); Carbon Co., E Rosebud Lake, 5,400-6,200ft, 3.vii-13.viii.1966, B and C. Durden (4♀, AMNH); 3-Forks, 1.viii.1918, A.L. Melander (2♂4♀, USNM); Georgestown Lake, 31.vii.1923, A.L. Melander (1♀, USNM); Petroleum Co., 1.5 mi S and 5 mi W Winnett, 30.vii.1969, N.E. Rees (2♀, USNM); Wabaux, 3.ix.1952, C.W. Sabrosky (1♂, USNM). **Nebraska:** West Point, 9.ix.1912, J.C. Vrawford (1♂6♀, USNM). **New Hampshire:** Bandelier Mon., Frijoles Can., 14.vi.1960, Burks and Kinzer (1♀, USNM); Pinedale, 7, vi.1949, L.C. Wyman (1♀, USNM); Socorro, 1916, S.W. Williston

(6♀, USNM). **Nevada:** Clark Co., Charleston Peak, Kyle Canyon, 2,200m, 14.vii.1966, P.H. Arnaud, Jr. (1♂, CASC); Lander Co., Austin(30mi S), Kingston Camp, 7,300ft, 16.vii.1966, F.P. and M. Ringdige (1♀, AMNH); Mercury, Byu-Aec-Nts, 11.viii.1965 (1♂1♀, USNM); Reno, Panther Valley, 600 Newport Lane, 24.viii.1983, P.H. Arnaud, Jr. (1♂1♀, CASC); Sparks, 28.vi.1927, E.P. van Duzee (2♂,CAS); Washoe Co., Vya, 19.vii.1927 (1♂, CUIC); White Pine Co., Baker(14mi W), Upper Lehman Cr., 9,800ft, 4.viii.1966, F.P. and M. Rindge (1♂,AMNH). **New Jersey:** Moorestown, 27.vi.1962, F.A. Streams, host: *Lygus linolaris*, (1♂, USNM); Woodbury, 7.vi.1891, C.W. Johnson (2♂, USNM). **New Mexico:** Bernalillo Co., E Slope Sandia Mts., Cerdar Crest(14km W), 2,438m, 15.vii.1976, T.W. Davies (1♂1♀, AMNH, CASC); Catron, Clenwood, 1.vi.1972, W.W. Wirth (1♂, USNM); Dona Ana Co., Organ Mts., Finley Cyn., 5,000ft, 2.v.1982, N.L.Evenhuis (3♂, BPBM); Eddy Co., Carlsbad, 30.v.1983, W.J. Pulawski (1♂, CASC); Grant Co., Gila Nat. For., Silver City(2mi N), 2,250m, 29-31.vii.1982, J.E. and W.M. O'Hara (1♂, DEBU); Hidalgo Co., Rodeo (11mi N), 22.viii.1962 and 1.v.1967, Rozen and Favreau at al (2♂1♀, AMNH); McKinley Co., 24.viii.1959, N. Mars (1♂, KSUC); Luna Co., Columbus, 24.iv.1985, W.J. Pulawski (1M, CASC); Las Cruces, 30.iv.1942, A.L. Melander and Townsend (2♀, USNM, BMNH); Rio Arriba Co., Lower Canjilon Lakes, 6.vii.1978, Davis (1♀, CASC); Valencia Co., 24.viii.1959, N. Marston (1♂, KSUC). **New York:** Brentwood, L.I. 14.ix.1935, Blanton and Borders (1♀, CUIC); Babylon, 30.v.1934, F.S. Blanton (1♂2♀, CUIC); Cld. Spr. Harb., 3.viii.1927, A.L. Melander (2♂, USNM); Rochester, 22.x.1933, R.L. Post (2♂, AMNH); Suffolk Co., 12.ix.1964, M.I. Blendermann (1♀, CUIC); Shoon, 26.vi.1934, A.L. Melander (1♀, USNM). **North Carolina:** Cherokee, 2,000ft, 29.v.1957, W.R.M. Mason (1♂, CNCI). **North Dakota:** Beach, 3.ix.1921, R.L. Webster (1♂, USNM); Bismarck, 14.vi.1918, J.M. Aldrich (1♀, USNM); Minot, 18.vi.1918, J.M. Aldrich (2♀, USNM); Mott, 5.x.1915, I.N. Gabrielson (2♂, USNM); Mercer Co., Ecotone, 4-6.viii.1972, A.C.F. Hung (2♀, USNM); Mountrail Co., White Lake, 8.vi.1969, W.W. Wirth (1♀, USNM); Sanish, 27.vii.1918, J.M. Aldrich (1♀, USNM). **New Mexico:** Chaves Co., 20 mi NW Kenna, 12.v.1988, malaise trap, N. Jorgensen (1♀, CNCI); Colfax Co., 4 mi NW Ute Park, malaise trap, 22.vii.1976, N. Jorgensen (1♀, CNCI); De Baca Co., Fort Summer, 7.vi.1988, malaise trap, N. Jorgensen (5♂8♀, CNCI); Loncoln Co., Bonita Lake Region, 8.vii.1988, malaise trap, N. Jorgensen (1♂1♀, CNCI); Otero Co., Bluff Springs, 15.vi.1988, malaise trap, N. Jorgensen (1♀, CNCI); Otero Co., Penasco River, Mayhill (8 mi W), 15.vi.1988, N. Jorgensen (4♂4♀, CNCI); Roosevelt Co., Blackwater Draw, nr. Portales, 4,000ft, desert malaise, 1.iv.-24-30.v.1991, J.E. O'Hara and N. Jorgensen (12♂4♀, CNCI); Roosevelt Co., Portales (4 mi SE, 14 mi SW, 7-8 mi NE and 6 mi E), 4.vii.1988, 7.iv.-28.vi.1988, 24.x.1987, 19-31.v.1976, 16.vi.1972 and 6.xi.1984, malaise trap, N. Jorgensen (43♂43♀, CNCI); San Miguel Co., Sapello (5 mi W), 27.v.1976, N. Jorgensen (2♂, CNCI); Sitting Bull Falls, 29.vi.1973, N. Jorgensen (5♂, CNCI); Torrance Co., Red Canyon camp Ground, 6 mi W manzano, 12.vii.1988, malaise trap, N. Jorgensen (1♀, CNCI); Torrance Co., Manzano

Mtns., 8 mi W Tajique, 7,500ft, 11-12.viii.1993, J.E. O'Hara (1♂, CNCI). **Oklahoma:** Cleveland Co., 18.iii.1931 (1♂, AMNH); Woodward Co., nr. Freedom, 8.v.1974, G.F. and S. Hevel (1♂, USNM). **Oregon:** Deschutes Co., Deschutes River, Pringle Falls(1mi SW), 31.vii.1974, P.H. Arnaud, Jr. (1♂3♀, CAS, AMNH); Klamath Lake, Eagle Ridge, 13-24.vi.1924, C.L. Fox (1♂2♀, CASC); Mt., Hood, 3,000ft, 29-30.vii.1921, A.L. Melander, (6♂2♀, USNM); Marion Co., Silverton Hills, 5.v.1940, R.E. Rieder (1♂, USNM); North Powder, 3,240 ft, 10.viii.1929, H.A. Soullen (1♀, TAMU); Umapine, 21.vi.1921, A.L. Melander (1♂1♀, USNM); Sisters, 3,180ft, 13.viii.1929, H.A. Scullen (1♀, CUIC). **Pennsylvania:** Luzerne Co., Alden, 12.v.1964, J.G. Chillcott (1♂, CNCI); Philadelphia, 23.viii.1900 (1♀, USNM). **South Carolina:** Clemson, 27.iii.1951, W.R.M. Mason (1♂, CNCI); Columbia, P. Luginbill, host: *Blissus leucopterus* (1♀, USNM). **South Dakota:** Brookings, 24.v.1918 and 30.viii.1891, J.M. Aldrich and H.C. Serverin (2♂4♀, USNM); Brookings (2♂1♀, BMNH); Custer, 15.vii.1924 (2♂1♀, USNM); Custer (2♀, TAMU); Hot Springs, 6.vii.1961, H.A. Howden (1♀, CNCI). Pringle (8mi N), Flynn Greek, 5,400ft, 8-11.vii.1961, H. and A. Howden (5♂5♀, CNCI); Sylvan Lake (2mi S), Black Hills, 11.vii.1961, H.A. Howden (4♀, CNCI); Pierre, 22-23.v.1930, J.M. Aldrich (4♂7♀, USNM); Phillip, 8.viii.1924 (1♀, USNM); Rapid City, J.M. Aldrich (1♂2♀, USNM). **Texas:** Big Bent N.P., Green Gulch and Pine Can., 3,000-6,000ft, 1-4.21. v.1959, J.F. McAlpine (29♂22♀, CNCI); College Station, 11.vii.1917, 22.x.1917, 15.iii.1922, 15.x.1933, H.J. Reinhard etc. (7♂, CAS, CUIC, TAMU); Del Rio, 25-26.iv.1959, Becker and Hawden and J.F. McAlpine (2♂, CNCI); N.W. Blanco Co., Davis Ranch, 23.iv.1959, W.R.M. Mason (1♀, CNCI); Ft. Davis(10mi W), Nr. Pt. of Rocks, 5,000ft, 28-30.v.1959, F. McAlpine (2♂2♀, CNCI); Fredericksburg, 16-18.iv.1959, W.R.N. Mason and J.F. McAlpine (4♂, CNCI); Kerrville, 2-21.iv.1959, J.F. McAlpine (7♂3♀, CNCI); Jeff Davis Co., Toyahvale, 22.iii.1967, D.M. Wood (2♂2♀, CNCI); Randall Co., Palo Duro Canyon St. Park, 26.v.7.vi.1991, J.E. Swann (1♂, DEBU); S Austin, (1♂, USNM). **Utah:** Blue Creek, 19.vii.1934, G.F. Knowlton (1♂, TAMU); Cache Co., Newton and Clearcreek Cyn., 11.vi-3.vii.1954, G.F. Knowlton (2♀, AMNH); Corinne, 26.viii.1953, G.F. Knowlton (1♂, USNM); Dgeen Cn., Hunksville, 21.vii.1922, E.P. Van Duzee (3♂, CASC); Elsinore, 20.x.1929, D.E. Fox (1♂, USNM); Emery Co., Gilson Butte, 31.vii.1982, A. and K. Menke (1♀, USNM); Ft. Duchesne, 21.vii.1958, G.F. Knowlton (2♂, USNM); Fort Duchesne, 28.vi.1937, G.F. Knowlton (2♂, DEIC); Garland, 29.v.1930, G.F. Knowltons, from *Norta altissima* (1♂, TAMU); Halbert, 15.viii.1930, M.J. Janes (1♂, TAMU); Hanksville (24mi S), Henry Mts., 7,500ft, 29.vii.1968, J.E.H. Martin (1♂, CNCI); Henry Mts., Bull Greek Pass, 10,200ft, 18.vii.1968, J.E.H. Martin (1♂, CNCI); Hyde Park, 10.viii.1974, G.F. Knowlton (1♀, BMNH); Kaysville, 20.x.1914, L.P. Rockwood (1♂1♀, USNM); Logan Canon, 20.vi. 1934, T.O. Thatcher (1♀, USNM); La Sal, 3.viii. L.H. Gloya (1♀, KSUC); Midvale, 7.viii.1937, G.F. Knowlton (1♀, DEIC); Midvale, 2-20.ix.1953, T.O. Thatcher (2♂, USNM); Milford, 19.viii.1958, G.F. Knowlton (1♀, USNM); Moab, 20.viii.1936, G.F. Knowlton (1♂, USNM); San Juan Co.(5mi W), Monticello, Dalton

Springs Camp, 8500ft, 12.vii.1963., F.P. and M. Rindge (1♂1♀, AMNH); Prove, 31.vii.1937, G.F. Knowlton (1♂, DEIC); Provo, 4,750ft, 29.vii-1.viii.1920 and 19.vi.1937, H.P. Chindler et al (2♂1♀, CAS, AMNH); Randolph, 23.viii.1957, (1♀, TAMU); Richfield, 20.x.1929, D.E. Fox (1♂, USNM); Tooele Co., Hwy 80, 22.5 km E Knolls, 23.viii.1983, P.H. Arnaud, Jr. (1♂, CASC); Uinta Mts., 16.viii.1940, Hall (1♂3♀, USNM); Utah Lake, nr. Lehi, 25.vi.1922, E.P. van Duzee (1♀, CASC); Vernal, 22.vii.1958, G.F. Knowlton (2♂, USNM); Vernal (22-30mi N), 8,000-8,400ft, 8.vii.1961, B.H. Poole and J.G. Chillcott (1♂2♀, CNCI); Wasatch Co., Strawberry Valley, 7,800ft, 9.vii.1961, J.G. Chillcott (1♂, CNCI); Wasatch Mts., Cache National Forest, 31.vii.1940, D.G. Hall (2♂, USNM). **Virginia:** Mathews, 9.iv.1957, A.L. Melander (1♀, USNM). **Washington:** Almota, (2♀, USNM); Asotin, 4.vi.1930, J.M. Aldrich (1♂, USNM); Benton Co., Hanford Site, 11.iv.1994, R.S. Zack (7♂2♀, CNCI); Benton Co., West Richland, 19.v.1979, N.E. Woodley (1♂, USNM); Central Ferry, 3.ix.1921, A.L. Melander (1♂, USNM); Fishtrap Lake, 8.viii, J.M. Aldrich (4♀, USNM); Franklin Co., Sacajaweast Pk., 12.vii.1988. W. N. and D. Mathis (1♂, USNM); Grant Co., Columbia River, Mattana (2mi S), 5.vi.1979, N.E. Woodley (1♀, USNM); Kamiac Mt., 4.vii.1918, A.L. Melander (1♂, USNM); Kettle Falls, 3.v.1912 (1♂, USNM); Lind, 10.vi.1919, F.W. Carlson (1♂, USNM); Oroville, (3♂1♀, USNM); Pallouse, (1♀, USNM); Pullman, 21.v.1907, 10.vi.1911 and 23.v.1918, (5♂8♀, USNM); Richland (10mi NW), 26.v.1979 (1♀, USNM); Ritzville, 12.vi.1920, R.C. Shannon (2♀, USNM, CUIC); Spokane, 7.viii.1924, J.M. Aldrich (18♂16♀, USNM); Pullman, 13.v.1923, 3.vii.1921 and 25.v.1924, A.L. Melander (4♂6♀, USNM); Union Flat, 29.viii.1916 (1♀, USNM); Walla Walla, 27.vi.1941, H. Lanchester (1♂1♀, USNM); Wawawai, 20.v.1911 and 12.vii.1925, C.L. Fox (4♂, CAS, USNM); Wawawai, 30.v.1921, A.L. Melander (1♀, USNM). **Wisconsin:** Blue Mts., Rose Spg., 19.vi.1921, A.L. Melander (1♀, USNM); Cashmere, 29.v.1917, A.L. Melander (1♂, USNM); Creston, 27.vi.1924, A.L. Melander (2♀, USNM); Coulee City, 3.ix.1920, R.C. Shannon, host: *Ceanoth velutinusa* (2♀, USNM); Lake Mills, 5.vii.1935, F. Snyder (1♀, AMNH); Moses Coulee, 22.iv.1933 (1♀, CUIC); Mt. Rainier, Dege Peak, 25.viii.1934, A.L. Melander (2♂, USNM); No. Yakima, 22.v.1917, A.L. Melander (1♂, USNM); Polk Co., St Croix Falls, 18.x.1936, F. Snyder (1♀, AMNH); Paterson, 26.iv.1936 (1♀, USNM); Pateros, 3.viii.1919, A.L. Melander (2♂1♀, USNM); Ritzville, 13-17.vii.1922, M.C. Lane (2♂3♀, USNM); R.R. Bridge Leavenworth, 27.vii.1919, Burrill (1♂, USNM); Stehekin, Lake Chelan, 30.vii.1919, A. L. Melander (1♂1♀, USNM); Toppenish, 19.vi.1923, A. L. Melander (14♂4♀, USNM). **Wyoming:** Moran, 25.vii.1934, A.L. Melander (3♀, USNM); Crook Co., Black Hills Nat. For. Cook Lake rec. Area, 5.viii.1990, J.E. Swann (1♂, DEBU); Sweetwater Co., 70mi E Rock Spgs., 15.viii.1963, N.B. Marston (1♂1♀, USNM); South Wyoming, 25.viii, C.B. Philip (1♀, CASC); Yellowstone Park, Lewis Lake, 28.vii.1934, A.L. Melander (1♀, USNM); Yellowstone Park, U. Geyser Basin, 7.viii.1918, A.L. Melander (1♀, USNM). **Doubtful States:** Skeurordoala, 7.viii.1939, W.W. Wirth (1♀, USNM); Pleos, Groae, 10.ix.1931, G.F. Knowlton (1♂, TAMU); Bachis Slough,

29.v.1931 (1♂, USNM); Alamo Alto Sta., 30.ix.1950, *L. alyssoides* (? host), (1♀, USNM). **MEXICO.** Baja California, Agua Caliente (San Carlos), 18.5 km E Maneadero, 6.viii.1973, P.H. Arnaud, Jr. (3♂1♀, CASC); Chih, 30 mi NW Chih, Majalca, 5,000ft, 17.iv.1961, Howden and Martin (1♂, CNCI); Dgo, 10-26 mi W El Salto, 8,000-9,000ft, 10,27.vii.1964, J.F. McAlpine (3♂, CNCI); Xochinilco, Elev, 8,000ft, 17.viii.1962, M.E. Milliron (1♀, CNCI). **RUSSIA.** Siberia, Novosibirsk Region, Chany Lake Bio. Station, on flowers, 3.vii.1991, S.A. Marshall (4♂, DEBU). **MONGOLIA.** Suchebaator aimak, Chadatin-bulan, 60km N v. Somon Bajanterem, 950m, 31.viii.1965, Dr. Z. Kaszab (1♀, CNCI).

## HOSTS

*Emblethis vicarius* Horvath (Hemiptera, Lygaeidae): - CANADA (BC) ( Scudder 1966: 286).

*Geocoris bullatus* (Say) (Hemiptera, Lygaeidae): - USA (CA) (Clancy and Pierce 1966: 857-858).

*Geocoris punctipes* (Say) (Hemiptera, Lygaeidae): - USA (CA) (Clancy and Pierce 1966: 857-858).

*Geocoris uliginosus* (Say) (Hemiptera, Lygaeidae): - USA (CA) (Clancy and Pierce 1966).

*Nysius angustatus* Uhler (Hemiptera, Lygaeidae): - USA (KS, Garden City) (new record).

*Nysius raphanus* Howard (Hemiptera, Lygaeidae): - USA (CA)(Clancy and Pierce 1966: 858).

*Nysius ericae* (Schilling)(= *Nysius niger* Baker 1906) (Hemiptera, Lygaeidae): - USA (MN) (Bird and Mitchener 1953: 44).

*Lygus linolaris* (Palisot) (Hemiptera, Miridae): - USA (NJ, Moorestown) (new record).

## NOTES

*Phasia aldrichii* (Townsend) is a Holarctic species. Although widely distributed in the Nearctic region, the only Palearctic records are from Hungary, northern Kazakhstan, southern Siberia, and Mongolia (Draber-Mońko 1965: 107-108 and Herting 1984: 170).

### 3.5.2 *Phasia emdeni* (Draber-Mońko, 1970)

(Figure I-18.1-5, II-4.1)

*Hyalomyia emdeni* Draber-Mońko, 1970: 693.

*Phasia (Hyalomyia) emdeni*: Herting 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog) -Ziegler 1994: 159 (review).

**DESCRIPTION**

Body length: 4-5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity. Frontal vitta black, triangular. Frontal vitta at base of antennae 0.4-0.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.8 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black. Vibrissa well differentiated; intervibrissal distance 2.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs black; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.7 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 2.8 times its width. Occiput slightly convex, greyish yellow pruinose; hairs black.

**THORAX.** Mesoscutum black thinly pruinose, with fine black hairs. 0+1 acrostichal seta; 1+1(2) dorsocentral seta; 2-3 postpronotal setae; presutural supra-alar seta present, but fine; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1 katapisternal seta; 3 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter black. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 1 *pv* and 0-1 *p*. apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus black. Fore claws black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia slightly arched, black, with one row of long *ad* and *pd*. Anterior spine-like setae of hind tibia present.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1.1:1:1.1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III silvery (on posterior 3/4). Pruinosity of tergite IV, V silvery; hair spots distinct. Sternite VII (sheath) longer than sternite VI; flattened dorsoventrally, median cleft, bent, apex directed dorsally, smooth ventrally; in ventral view, narrowest at middle, outer side of posterior half arched.

**MALE.** Unknown.

**TYPE MATERIAL**

*Hyalomyia emdeni* Draber-Moňko, 1970. Holotype ♀, France, Hyères, V.48630, Becker (ZMHU or lost, not examined).



**OTHER MATERIAL EXAMINED**

**SPAIN.** Prov. Salamanca, Villar de Ciervo, 30.v. and 10.vi. 1989, Tschorsnig (2♀, DEBU).

**HOST**

Unknown.

**NOTES**

Draber-Moňko (1970 and *pers. comm.*) noted that the holotype of this species was housed in the Museum für Naturkunde der Humboldt-Universität (ZMHU), Berlin, Germany. At this time, however, it cannot be located (H. Schumann, *pers. comm.*).

*Phasia emdeni* (Draber-Moňko) is similar to *Phasia pandellei* (Dupuis), but differs in the structures of female sternite VII (sheath) and hind tibia bristles.

**3.5.3 *Phasia faceta* Sun, sp. nov.**

(Figure I-18.6-10, II-6.2)

**TYPE MATERIAL**

Holotype ♀, PAPUA NEW GUINEA, NE Wau, Morobe Distr., 1,200m, 27.ii.1965, J. and M. Sedlacek, Malaise Trap (BPBM).

**DESCRIPTION**

Body length: 3.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black with grey pruinosity. Frontal vitta broad, black, triangular. Frontal vitta at base of antennae 6.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.2 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting; black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 4 times distance between vibrissa and eye on same side; facial ridge with bristles on the lower 1/6. Gena black with grey pruinosity; hairs black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.4 times as long as pedicel; arista thickened on basal 0.35. Length of oral opening 2.1 times its width. Occiput flattened, greyish yellow pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum thinly pruinose (greyish brown), without black longitudinal vitta, with fine black hairs. 1+1 acrostichal setae; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepi-

meral setae medium size, black; 5 katepisternal setae; 3 meral setae. Scutellum black, brownish grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.5 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Mid femur black; hairs black. Mid tibia black, with 1 *p* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with one row of *ad* and 1 long *pd*. Anterior spine-like setae of hind tibia well developed.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area (on basal lateral side); pruinosity absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.6. Hair spots indistinct. Sternite VII (sheath) longer than sternite VI, tapered, laterally flattened in the middle, almost pointed apically, not bent; apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

*Phasia faceta* is named for the extremely large dorsal eye facets.

#### 3.5.4 *Phasia girschneri* (Draber-Mońko, 1965)

(see Draber-Mońko 1965: 97, figs 47-53)

*Alophora (Hyalomyia) girschneri* Draber-Mońko, 1965: 93.

*Phasia (Hyalomyia) girschneri*: Herting 1984: 170 (catalog); - Herting and Dely-Draskovits 1993 (catalog) - Ziegler 1994: 159 (review).

*Alophora girschneri*: Zimin et al 1988: 1297 (key).

**NOTES:** This species was described by Draber-Mońko (1965:93) based on a single female specimen collected from Russia [Zayachi I., near Astrakhan, 22.vi.1886, Semenov-Tian-Shanskij]. The holotype is housed in the Institute of Zoology, Russian Academy of Sciences, St. Petersburg, Russia (not examined). The male, host and biology of this species are unknown.

*Phasia girschneri* (Draber-Mońko) is similar to *Phasia emdeni* (Draber-Mońko) and *Phasia pandellei* (Dupuis), but it differs in the structures of female sternite VII (sheath).

**3.5.5 *Phasia indica* (Mesnil, 1953), comb. nov.**

(Figures I-25, II-5.1)

*Parallophora indica* Mesnil, 1953: 177.*Alophora (Hyalomyia) indica*: Draber-Moňko 1965: 98.*Alophora (Hyalomyia) indica*: Crosskey 1976: 166 (catalog).**DESCRIPTION**

Body length: 3.5-4 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta parallel, black, with strongly silvery pruinosity. Frontal vitta at base of antennae 1.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, grey pruinose. Vibrissa well differentiated; intervibrissal distance 2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna pedicel yellow or brown; first flagellomere black, 1.6 times as long as pedicel; arista thickened on basal 0.5, second aristomere 2 times as long as its width. Length of oral opening 1.5 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, but fine; 0-1 postsutural intra-alar seta; 2 notopleural setae; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae medium size, black; usually 1 katapisternal seta; 7-9 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicoستا brown. Wing hyaline, narrow; petiole of apical cell 0.4 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow, or brown. **LEGS.** Fore femur swollen black; hairs black. Fore tibia black, without bristles, apically with 0-1 *pv*, 1 *pd* and 1 *d*. Fore tarus brown to black. Fore claws brown, apex black, 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown; hairs black. Mid tibia brown, with 0-1 *a* and 1 *v*, apically 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur brown; hairs black. Hind tibia slightly arched, brown, with 3-4 *ad* and 8-10 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta present, but interrupted between tergites. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1.1:1.1; relative width I+II:III:IV:V = 0.7:1:1.1:0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III silvery (on posterior half). Pruinosity of terg-

ites IV, V silvery; hair spots distinct. **TERMINALIA.** Syncercus long, with a semicircular notch posteriorly; apex strongly bent ventrally. Surstylus straight, slightly broadened and bent upward on apical half, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallapodeme. Pregonite small triangular. Postgonite well developed, pointed, longer than pregonite, and with sparse hairs ventrally. Phallus slender, 1.3-1.4 times as long as hypandrium, with fine hairs dorsally. Distiphallus swollen, with a row of regular saw teeth ventrally.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus. Frons triangular. Anterior spine-like setae of hind tibia well developed. Sternite VII (sheath) longer than sternite VIII, tapered, broad apically, slightly bent, apex directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Parallophora indica* Mesnil, 1953. Holotype ♂, INDIA, Uttar Pradesh, Saharanpur (BMNH, examined); paratypes, 1♂3♀, "10.v.17, parasitic on *Bagrada picta* /Bot: gardens/ Saharanpur/C.No. 1554/Imperial Ent. Identification 2240 of 1940/India" (with pupae, BMNH, examined).

#### OTHER MATERIAL EXAMINED

**INDIA.** "10.v.17, parasitic on *Bagrada picta*/Bot: gardens/ Saharanpur/ C.No. 1554/ Imperial Ent. Identification 2240 of 1940/India" (1♂, BMNH); "H.D.E., I.A.R.J. Identification 106 of 1949/ Com. Inst.Ent. Coll. No. 11277/type label (?)" [det by L.Mesnil as *Alophora indica* Mesnil 1951] (1♂2♀, CNCI, BMNH); Delhi, Iari, 13-14.v.1985, J. Lasalle (6♂2♀, ROME). **DOUBTFUL LOCALITY.** "[INDIA ?] 'emerged on 19.vi.1967, [from] *Bagrada picta*' ex: Mesnil Collection (1♂, CNCI)"; " [INDIA ?] 'Lasayai, 9.iv.1969, [ex:] *Bagrada hilaris*, (1♀, BMNH, with pupae)".

#### HOSTS

*Bagrada picta* (Fabr.) (Hemiptera, Pentatomidae): - India (Mesnil 1953: 177 - Draber-Moňko 1965: 101 - Crosskey 1976: 291).

*Bagrada hilaris* (Burm.) (Hemiptera, Pentatomidae): - India (Crosskey 1976: 291).

#### NOTES

*Phasia indica* (Mesnil) is only found in India, but its host, *Bagrada picta* (Fab.) is also distributed in the Afrotropical region.

#### 3.5.6 *Phasia mesnili* (Draber-Moňko, 1965)

(Figures I-35, II-6.1)

*Alophora (Hyalomyia) mesnili* Draber-Moňko, 1965: 109.

*Alophora pusilla*: Belanovskij 1951: 145 (in part).

*Alophora (Paralophora) pusilla*: Victorov 1961: 53.

*Alophora (Hyalomyia) theodori* Draber-Moňko, 1965: 114.

*Phasia (Hyalomyia) mesnili*: Herting 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog) - Ziegler 1994: 157-180 (revision, new synonym).

*Phasia (Hyalomyia) theodori*: Herting 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 413 (catalog).

## DESCRIPTION

Body length: 3-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, silky grey pruinose. Frontal vitta nearly parallel, grey pruinose. Frontal vitta at base of antennae 0.9-1.0 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.3-1.4 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs white; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna pedicel yellow or brown; first flagellomere black, 1.1-1.2 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 2 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown.

**THORAX.** Mesoscutum black shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 0(1)+1(2) dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, but fine; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1 katepisternal seta; 4-6 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown to black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws black, 1.1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 5-6 *ad* and 3 *pd*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta distinctly present (but interrupted between tergites). Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III (at least on posterior 2/3) and tergites IV, V silvery; hair spots distinct. **TERMINALIA.** Syncercus V-notched posteriorly; posterior margin bent ventrally. Surstylus stripe-like, longer than cercus; apex slightly upward. Ejaculatory apodeme small, knob-

like. Hypandrium almost as long as phallapodeme. Pregonite long, apical spherical, sparsely haired dorsally. Postgonite broad, outer angle pointed, haired ventrally, as long as pregonite. Phallus slender, 1.3-1.4 times as long as hypandrium, haired dorsally on basal 1/2. Distiphallus with a row of regular sawteeth.

**FEMALE.** Wing hyaline. Eyes nearly touching. Frontal vitta triangular. Anterior spine-like setae of hind tibia well developed. Sternite VII (sheath) longer than sternite VI, arrow like in ventral view, pointed apically, not bent, apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora mesnili* Draber-Mońko, 1965. Holotype ♀, RUSSIA, Stalingradskaja Oblast, Tinguta, 17.vii.1952, G. Viktorov (Zoological Measum, University of Moscow, not examined).

*Alophora (Hyalomyia) theodori* Draber-Mońko, 1965. Holotype ♀, ISRAEL, Ein-Gedi, 1.v.1957, Kugler (Hebrew University, Jerusalem, not examined); allotype ♂, TUNISIA, Bou Hedma, v.1921, C. Dumont [without genitalia] (CNCI, examined); paratype, 1 ♂, [ALGERIA], Biskra, iv. 52515 (HUMB, abdomen on slide, examined).

#### OTHER MATERIAL EXAMINED

**GREECE.** Knossus, 150m, 16-17.iv.1980 (1 ♂, BMNH). **ISRAEL.** Kefar Schemuel, 22.iv and 29.iv.1968, S. Bleszynski (1 ♂1 ♀, CNCI); Ein Gedi, 40km, N. Sedom, 29.iii.1968, S. Bleszynski (1 ♀, CNCI); Beersheba, 21.vi.1952, G.A. Mavromoustakis (1 ♂1 ♀, BMNH); Deganya, 13-16.v.1968, S. Bleszynski (1 ♂, CNCI); Hadera, Birket Atta., 24.v.1980, A. Freidberg (1 ♂, USNM); Hebr. University, 8.4.1951, J. Wahrman (1 ♂, BMNH). **MOROCCO.** Haut, Atlas, Jb. Ayachi, Tizi-n-Zou, Trib.B.I. and Mikdane Stream l., 1,000-2,500m, 6 and 8.viii.1963, A.C. Pont (2 ♂1 ♀, BMNH); Haut. Atlas, Jb. Ayachi, 29.vii.1963, A.C. Pont (4 ♂, BMNH). **RUSSIA.** Siberia, Novosibirsk Region, Chany Lake Bio. Stn., 1-5.vii.1991, S.A. Marshall (2 ♂, DEBU). **SPAIN.** Prov. Salamanca, Castillejo M. Viejo, 17.ix.1986, Tschorsnig (2 ♂, DEBU); Prov. Salamanca, Villar de Ciervo, 10.v.1989, Tschorsnig (1 ♀, DEBU). **TUNISIA.** Bou Hedma and Maknassy, C. Dumont (3 ♂, CNCI). **TURKEY.** Ankara, 16km W. Kirikkale, 2,700ft, 29.vi.1960, Guichard and Harvey, B.M. 1960-364 (25 ♂5 ♀, BMNH); Amasya, 30 km, Amasya-Mecitozu, 1.viii.1960, 3,000ft, Guichard and Harvey (1 ♂, BMNH).

#### HOSTS

*Eysarcoris ventralis* (Westwood) [= *Stollia inconspicua* (H.-S.)] (Hemiptera, Pentatomidae): - (Draber-Mońko 1965, Ziegler 1994: 168)

*Eysarcoris* [= *Stollia*] *aeneus* (Scopoli) (Hemiptera, Pentatomidae): - (Draber-Mońko 1965, Ziegler 1994: 168)

**3.5.7 *Phasia normalis* (Curran, 1927), comb. nov.**

(Figures I-42, II-3.3)

*Strongylogaster normalis* Curran, 1927: 355.*Hyalomyia normalis*: Malloch 1930: 95.*Besserioides bancrofti* Paramonov, 1958: 597, **syn. nov.** - Crosskey 1973: 111 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).*Alophora (Hyalomyia) normalis*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).**DESCRIPTION**

Body length: 3-6 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance narrower than ocellar triangle, but wider than ocellus. Dorsal facets of eyes same as ventral facets. Fronto-orbital plate black with grey pruinosity. Frontal vitta narrow, parallel. Frontal vitta at base of antennae as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown and black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs white; height less than 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.3 times as long as pedicel; arista thickened on basal 1/3. Length of oral opening 2.3 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow and brown.

**THORAX.** Mesoscutum thinly pruinose laterally, with fine black hairs. 0(1)+1 acrostichal setae; 1+1(2) dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta absent; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1 katepisternal seta; 4-5 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown and black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown to black; 0.8-0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 0-1 *ad*, 0-1 *a*, 1 *av*, 1 *pv*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 3 *ad* and 3 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta distinctly present; abdomen spherical. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:0.9:0.9; relative width I+II:III:IV:V = 0.4:1:1:0.8. Syntergite I+II shiny, not prui-

nose. Tergites III, IV greyish yellow pruinose on anterior 2/5; but shining on posterior 3/5; hair spots distinct. Tergite V greyish yellow pruinose on whole tergum except the central black longitudinal vitta; hair spots distinct. **TERMINALIA.** Syncercus deeply U-notched posteriorly, not bent downward. Surstylus broadly flattened, bent upward; almost as long as cercus. Ejaculatory apodeme small, knob-like. Hypandrium broad, shorter than phallopodeme. Epiphallus well developed. Pregonite well developed, shorter than postgonite, haired dorsally. Postgonite pointed, haired ventrally. Phallus slender, 1.3-1.4 times as long as hypandrium, with fine white hairs dorsally on basal 1/2. Distiphallus broad, membranous.

**FEMALE:** Wing hyaline. Eyes separated by a distance narrower than ocellus; almost touching. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) longer than sternite VI, parrot-mouth-like in profile, and arrow-like in ventral view, pointed apically, not bent, apex straight, almost smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Strongylogaster normalis* Curran, 1927. Holotype ♀, AUSTRALIA, Queensland, Palmerston (DEIC, not examined).

*Besserioides bancrofti* Paramonov, 1958. Holotype ♂, [AUSTRALIA], [Queensland], Palm Island, Bancroft (No. 5858, ANIC, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRALIA: New South Wales:** Cabramatta [?], 3.vi.1961, M. Nikitin (2♀, BMNH); Glen Innes (E), Kangawalla Game Res., Shannon Vale, 26.iv.1975, B.K. Cantrell (1♂, QDPC); Mount Kaputor National Park, 560m, 26.iii.1978, G. Daniceis (1♂, AMSA); Narrabri, 27.i.1960, M. Nikitin, B.M. 1960-619 (1♀, BMNH); Sydney, Lea (1♂, SAMA). **Queensland:** Brisbane (SE), Moggill Farm, 25m, 27.i-1.ii.1961, J.L. and M. Cabramaffa, Georges, 7.ii.1959, R. Valley (2♂4♀, BMNH, BPBM); Gatton, D.P.I. Research Satation, 5-11.v.1981 (1♀, QDPC); Kairi (N), D.P.I. Research Station, 30.vi.1980, B.K. Cantrell (5♂1♀, QDPC); Koah (N), 17.ix.1938 (3♂3♀, BMNH); Redlynch (N), 11.ix.1938, (2♂, BMNH); Thornlands (SE Qld.), 2.xi.1980, J.F. Donaldson (1♂, QDPC); [?], ii.1903, Brubetti (1♂, BMNH).

#### HOST

Unknown.

#### 3.5.8 *Phasia pandellei* (Dupuis, 1957)

(Figures I-44, II-4.2)

*Hyalomyia pandellei* Dupuis, 1957: 73; 1963: 105.

*Halophora pusilla* (Meigen) of Pandellé, 1894: 86 (misident).



*Alophora (Hyalomyia) pandellei*: Draber-Moňko 1965: 94 (redescription).

*Phasia (Hyalomyia) pandellei*: Herting 1984: 170 (catalog) - Ziegler 1994: 176 (review, biology).

## DESCRIPTION

Body length: 3-6 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, silky grey pruinose. Frontal vitta black with grey pruinosity. Frontal vitta at base of antennae 1.6 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.6 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5-1/4. Gena black with grey pruinosity; hairs white; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.25-0.3. Length of oral opening 1.9 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow, or brown.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0(1)+1 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, but fine; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae hair-like, black; 1 katepisternal seta; 5-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown to black. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarsus black. Fore claws black; 1.0-1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *p* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 3-4 *pd* and 3-4 *ad*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta distinctly present (ending on tergite IV). Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:1:0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergites III, IV, and V silvery; hair spots distinct. **TERMINALIA.** Syncercus deeply U-notched posteriorly, not bent. Surstylus broad, apex slightly arched dorsally, longer than cercus. Ejaculatory apodeme small. Hypandrium slightly longer than phallapodeme. Epiphallus well developed. Pregonite even, with a few saw teeth ventrally. Postgonite long, pointed. Phallus shorter than hypandrium, haired dorsally. Distiphallus broadened, rectangular. Lateroventral process with a row of sclerotized saw teeth.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus; not

touching. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) longer than sternite VI, flattened laterally, pointed, and slightly bent, apex directed dorsally, smooth ventrally, outer side of posterior half parallel-sided in ventral view. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia pandellei* Dupuis, 1957. Holotype ♀, FRANCE, Hautes-Pyrénées, Tarbes "♀ 1012" (MNHN, Paris, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRIA.** Feldkirch, Vorarlberg, Moosbrugger (1 ♀, DEIC). **GREECE.** Corfu Kalamaki, iv.1984, I.M. White (1 ♀, BMNH); Corfu, Sidari, 20.iv.1984, I.M. White (1 ♀, BMNH). **ITALY.** [no more data], (1 ♂, BMNH); Bologna, Borgo Capanne, viii.1950, (1 ♀, CNCI). **GERMANY.** Weiden/see, 25.vii.1965, [det by Mesnil as *Phasia pusilla*, 1985] (1 ♂2 ♀, CNCI). **SLOVAKIA.** mer. Kovacovske-Kopce, 13.v.1964, M. Chvala (1 ♀, BMNH). **SPAIN.** Prov. Salamanca, Villar de Ciervo, 30.v. and 10.vi.1989, Tschorsnig (2 ♂, DEBU). **DOUBTFUL LOCALITY.** Eyrs, coll. Oldenberg (1 ♀, DEIC).

#### HOST

Unknown.

#### NOTES

The type specimen came from Pandellé's collection, and had been labelled as *Alophora pusilla* by Pandellé. *Phasia pandellei* is also found in Hungary, Croatia, Switzerland (Wallis, Tessin) and Italy (Apennino Bolognese, Campania) (Herting 1984, Ziegler 1994).

#### 3.5.9 *Phasia punctigera* (Townsend, 1891)

(Figures I-46, II-5.4)

*Hyalomyia punctigera* Townsend, 1891: 135.

*Phoranthella morrisoni* Townsend, 1915: 23, *nomen nudum*.

*Phoranthella morrisoni* Brooks, 1945: 673 (redescription).

*Phoranthella punctigera*: Sabrosky and Arnaud 1965: 970 (catalog).

*Phasia punctigera*: O'Hara and Wood 1998: 765 (new combination).

#### DESCRIPTION

Body length: 4-7 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black, silky grey pruinose. Frontal vitta black. Frontal vitta at base of antennae 1.7-2.0 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, nearly as wide as first flagellomere. Lower margin of face projecting, visible in profile, black with grey pruinosity.

ity. Vibrissa not differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower than 1/4. Gena black with grey pruinosity; hairs white; height 0.1-0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 2-2.2 times its width. Occiput flattened, white pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta and fine black hairs. 0+0(1) acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta absent, or present, but fine (rarely); 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; scale-like hair absent. Anepimeral setae hair-like, black; 1 katapisternal seta; 6-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline; petiole of apical cell 0.35-0.5 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black (swollen); hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown, apex black; as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1 *p* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur swollen on 2/5 posteriorly, black; hairs black. Hind tibia strongly arched, distinctly shorter than hind femur, black, with 3-4 *ad* and 2-3 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.3; relative width I+II:III:IV:V = 0.5:1:1:0.7. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III evenly. Pruinosity of tergites IV, V silvery; hair spots distinct. **TERMINALIA.** Syncercus V-notched posteriorly, not bent. Surstylus slightly bent dorsally, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium longer than phallapodeme. Pregonite reduced, with two stout teeth. Postgonite short, as long as pregonite. Phallus slender, 1.3 times as long as hypandrium, not haired. Distiphallus well sclerotized.

**FEMALE.** Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia absent. Sternite V extremely long, longer than total length of previous sternites. Sternite VII (sheath) shorter than sternite VI, shovel-like, narrow apically, bent, apex directed ventrally, sternite VII with linear wrinkles ventrally, median area membranous. Ovipositor bent upward.

#### TYPE MATERIAL

*Phoranthella morrisoni* Townsend. Holotype ♀, [USA], Georgia (USNM, No. 19139, examined).

## OTHER MATERIAL EXAMINED

**CANADA. Quebec:** Lac Lauzon, Mt. Tremblant Pk., 28.viii.1956, H.C. Hockett (1♂, USNM). **USA. Alabama:** Montgomery, 22.xi.1946, H.R. Dodge (1♂1♀, USNM). **Arizona:** Cochise Co., Southernwestern Research Station, 5mi, 5,400ft, W. Portal, 1-9.viii.1956, E. Ordway, C. and M. Cazier (6♂1♀, AMNH); Huachuca Mts., Sierra Vista (15mi S), Ramsey Cyn., 5,200ft, 7.iv.1967, R.F. Sternitzky (2♂, CNCI); Near Patagonia, 6.x.1951, E.C. Zimmerman (1♀, BMNH); Ramsey Cn., Huachuca Mts., 25.iii.1967, 5,500ft, D.M. Wood (1♂, CNCI). **Arkansas:** Perry Co., 19.v.1956, (1♀, USNM); Washington Co., 29.v.1956 (1♀, USNM). **California:** Santa Clara Co., Baker (1♀, BMNH). **Colorado:** Pingree Park, 17.viii.1932, C.C. Fluke (1♂, AMNH); Golden, Mt. Vernon Cn., 7,200ft, 31.vii.1961, C.H. Mann (2♂, CNCI); Nederland, Caribou, 8,700ft, 7.viii.1961, J.E.R. Stainer (1♂, CNCI); [?], (1♂, BMNH). **District of Columbia:** Washington, D.C., Eastern Brch and Rock Creek, 2.vi.1917 and 22.x.1914, C.H.T. Townsend and R.C. Shannon (1♂2♀, USNM). **Idaho:** Boise, J.M. Aldrich (1♂, USNM); Moscow, 1-12.ix.1908, J.M. Aldrich (5♂5♀, USNM); Waha, 30.v.1924, A.L. Melander (1♀, USNM). **Indiana:** La Fayette, 22.x. and 19.x.1915, D.G. Hall and J.M. Aldrich (1♂1♀, USNM); Vinta, 7-8.vi.1899, Wickham (1♂, BMNH). **Kansas:** Manhattan, 15.vi.1923, W.V. Hedding (1♂, KSUC). **Maryland:** Beltsville, 30.vii.1916, W.R. Walton (1♀, USNM); July (1♂, BMNH); Grove Hill, 2.xi.1916, F.L. Aster (1♀, USNM); [?], (1♂, USNM); Leonardtown, 10.vii.1952, O.L. Cartwright (1♀, USNM). **Massachusetts:** Woods Hole, 13.ix.1912, C.T. Greene (1♀, AMNH); N Andover, 16.vii.1911, J.D. Tothill (1♂, CNCI). **Mississippi:** Aberdeen, 4.v.1921, H.C. Dozier (1♀, USNM); Agri. Col., 30.xi.1921, 22.iv.1922, H.W. Allen (1♂1♀, USNM); A & M. Col. 21.xi.1924, 15.v.1925, H.W. Allen (1♂1♀, USNM). **Nevada:** [?], 6.vii., Baker (1♀, USNM). **New Jersey:** Hornerstown, 14.v.1910 (1♀, AMNH); Lona, 16.v.1909 (1♂, USNM); Paterson, 4.x.1915 (1♂, USNM). **New Mexico:** Las Cruces, 31.viii. and 11.viii, C.H.T. Townsend (2♂, USNM, BMNH); Roosevelt Co., Portales, 8.iv.1988, N. Jorgensen (1♀, CNCI). **North Carolina:** Tuckasegee, 2,200ft, 30.viii.1957, J.G. Chillcott (1♀, CNCI); Valley of Black Mts., 25.viii.1906, W. Beutenmuller (1♂, AMNH); Wayne Co., 15.vi.1955., H.V. Weems, Jr. (2♂, USNM). **Oklahoma:** Marshall Co., Willis, 2-12.vi.1986, D.J. Peckham (70♂ 27♀, USNM). **Oregon:** Independence, 13.vi.1934, N.P. Iarson (1♀, USNM). **South Carolina:** Fairfax, 21.v.1931(?), E.W. Howe (2♂1♀, CUIC); St. George, 1.vi.1853, O.L. Cartwright (2♂, USNM). **Texas:** Austin, A.L. Melander (2♂1♀, USNM); Brazos Co., College Station, iv-v. and x.1917-1966, H.J. Reinhard, D.M. Wood ( 48♂29♀, CNCI, USNM, CUIC, TAMU); Burleson., 25.ix.1939, H. Menusan (1♀, CNCI); Comal River, 24.iii.1942, A.L. Melander (1♂, USNM); Dallas, Osten-Sacken (2♂, DEIC); Dallas, Bishopp, 19.iv.1916, J.M. Aldrich (2♂2♀, USNM); Denton, 27-29, vi., C.R. Jones, F.C. Bishopp (2♀, USNM); Donna, 22.x.1933. J.W. Monk (1♀, TAMN); Ft. Davis (21mi W) , 22-25.vii.1956 and 26.v.1901, E.G. Matthews etc. (3♂, CNCI, USNM); Kerrville, 31.iii-3iv.1959, J.F. McAlpine (21♂1♀, CNCI); Nacogdoches Co., 16.v.1941, H.J. Reinhard (2♂, CNCI); Neuecest, 25.ix. 1896,

Marlatt (1♂, USNM); Pleasanton, 22.iii.1937 (1♂, TAMU); San Antonio, 8,16.ix.1942 and 18.v.1918, A. Wetmore and A.L. Melander (2♂1♀, USNM); Dimmit Co., 28.ii.1933 (1♂, TAMU). **Utah:** Salt Lake, 24.vi.1922, A.L. Lovett (1♀, USNM). **Virginia:** Falls Church, 20.ix.1912, C.T. Greene (1♀, USNM); [?], 30.x.1926, N.K. Bigerow (1♀, CNCI). **Washington:** Benton Co., Hanford Site, ALE, Rattlesnake Ridge, 29.viii.1994, R.S. Zack (1♂, CNCI); Yakima Co., Wenas Creek For. Camp. 20mi NW Selah, 2,550ft, 25.v. 1986, N.E. Woodley (1♀, USNM); [?], (1♂, USNM); Pullman, 16.vii.1908, W.M. Mann (1♂, USNM). **Doubtful State:** "Osten-Sacken Collection (1♂, DEIC)". **MEXICO.** Chih., 12mi NW Gran Morelos, 15.viii.1950, R.F. Smith (1♂, AMNH).

#### HOST

Unknown.

#### NOTES

The type of *Hyalomyia punctigera* was not located but the description fits this species better than any other. *Phoranthella morrisoni* Townsend was erected for a specimen determined by Coquillett as *Phorantha occidentis* (Walker), but it remained undescribed until 1938 (Brooks 1945: 673).

#### 3.5.10 *Phasia purpurascens* (Townsend, 1891)

(Figures I-47, II-5.3)

*Hyalomyia purpurascens* Townsend, 1891: 137.

*Hyalomyia celer* Townsend, 1895: 65, **syn. nov.**

*Phorantha calyptrata* Coquillett, 1897: 44.

*Phorantha occidentis*: Coquillett, 1897: 44 (in part).

*Phorantha humeralis* Robertson, 1901: 286.

*Alophorellopsis argentifrons* Brooks, 1945: 675, **syn. nov.**

*Alophorellopsis purpurascens*: Brooks, 1945: 675 (redescription).

*Hyalomyia purpurascens*: Sabrosky and Arnaud 1965: 969 (catalog) - Arnaud 1978: 4 (host catalog).

#### DESCRIPTION

Body length: 3-6 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance almost as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta brown. Frontal vitta at base of antennae 1.1-1.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae present (but hair-like). Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.0-1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.2-1.3

times distance between vibrissa and eye on same side; facial ridge with bristles 2-4. Gena brown and black with grey pruinosity; hairs white; height 0.15-0.18 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2-1.3 times as long as pedicel; arista thickened on basal 0.3-0.35. Length of oral opening 2.2-2.3 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2-3 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron yellow pruinose; hairs black; scale-like hair absent. Anepimeral setae strongly, black; 1 katepisternal seta; 5-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, or pictured (rarely); petiole of apical cell 0.45-0.6 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *p* and 1 *d*. Fore tarsus black. Fore claws black; 0.8-0.9 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1-2 *p* and 1 *v*, apically with 1 *ad*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 3 *ad*, 3 *pd* and 2-3 *v*.

**ABDOMEN.** Abdominal tergites black; pruinosity absent, with small or big purple area; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.3; relative width I+II:III:IV:V = 0.5:1:1:0.7-0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III absent. Pruinosity of tergite IV absent, or silvery; hair spots distinct. Pruinosity of tergite V absent, or present (silvery); hair spots distinct. **TERMINALIA.** Syncercus triangular, U-notched posteriorly, apex strongly bent ventrally into hook-like. Surstylus broad, slightly arched dorsally, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium shorter than phallapodeme. Epiphallus well developed. Pregonite triangular. Postgonite pointed, longer than pregonite. Phallus slender, 1.3-1.4 times as long as hypandrium, haired. Distiphallus partly sclerotized.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia well developed (3-4 rows). Sternite VII (sheath) slightly longer than sternite VI, tapered, narrow apically, not bent, apex straight, almost smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia purpurascens* Townsend, 1891. Lectotype ♀, [USA], South Illinois, Robertson, (USNM, No.900, abdomen missing, examined); cotypes 4♂2♀, [USA], S Illinois, Robertson (SEMC, 1♂1♀ heads missing. 1♂ abdomen missing, examined).

*Hyalomyia celer* Townsend, 1895. Holotype ♀, [USA], New Mexico, Las Cruces, 6.18. (SEMC, examined)

*Phoranthia calyprata* Coquillett, 1897. Holotype ♂, [USA], Washington, D.C. (USNM, No. 3515, examined); paratype 1♂, [USA], Illinois, Algonquin, 16.viii.1895 (USNM, No. 3518, examined).

*Alophorellopsis argentifrons* Brooks, 1945. Holotype ♂, [CANADA], British Columbia, Oliver, 28.vi.1924, C.B. Garrett (CNCI, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Alberta:** Elkwater Park., 29.v.1952, A.R. Brooks (1♂, CNCI); Lethridge, 7.vii.1956, O. Peck (2♀, CNCI). **Ontario:** Ottawa, 17.vi.1955, J.G. Chillcott (2♀, CNCI); Ohsweken, 19.vi.1979, D. Morris (1♀, DEBU). **Saskatchewan:** Saskatoon, 9.v-28.vi.1949, A.R. Brooks (2♀, CNCI). **USA. Alabama:** Montgomery, 15.xi.1946, H.R. Dodge (3♂1♀, USNM). **Arizona:** Cochise Co., Turkey Ck. Cn., 24.iii.1967, D.M. Wood (4♀, CNCI); Cochise Co., 5mi SW Apache, 17.viii.1961, M.A. Cazier (1♀, AMNH); Cochise Co., 2mi NE Portal, 30.vii-1.viii.1959, M. Stathan (3♂3♀, AMNH); Cochise's Str., Dragoon Mts., 21.iii.1956, F. Werner, G. Bulter (1♀, TAMU); Graham Co., 2.4 km w Hwy 366, 1,160m, 27-28.v.1991, malaise trap, J. E. O'Hara (2♀, CNCI); Huachuca Mts., 15mi S Sierra Vista, Ramsey Cyn., 5,200ft, 7.iv.1967, R.F. Sternitzky (9♂6♀, CNCI); Organpipe Park, Alamo Canyon, 16.iv.1947, A.L. Melander (1♂, USNM); Portal (2.5-4mi E), 8.vi.1968 and 19.viii.1959, A.S. Menke, M. Statham (1♂1♀, USNM, AMNH); Yavapai Co., Congress, 23-26.iv.1967, D.M. Wood (1♂, CNCI). **Arkansas:** Washington Co., 24.v.1961 (1♂1♀, USNM). **California:** Laguna Beach, Hamilton (1♀, USNM); Pinehurst, 7.vi.1935, A.L. Melander (1♀, USNM); San Luis Obispo Co. (8mi W), Atascadero, 3.vii.1956 (1♂, CNCI); Thousand Palms, 1000 Palms Oasis, 30.iii.1955, W.R. Richards (1♀, CNCI); Up Sta Ana Riv., 21.vii.-28.ix.1953, A.L. Melander (2♂, USNM); Imperial Co., Gordon Well, 8.iv.1949, A.L. Melander (1♀, USNM); Camp Angelus, 8.ix.1953 and 19.ix.1954, A.L. Melander (2♂3♀, USNM). **Colorado:** Buena Vista, 7,800ft, 22-23.vi.1961, C.H. Mann (1♂, CNCI); Mt. Evans, Doolittle Ranch, 9,800ft, 18.vii.1961, C.H. Mann (1♀, CNCI). **District of Columbia:** Eastern Brch., 22.x.1914, R.C. Shannon (1♀, USNM); Rock Creek, 23.v. C.H.T. Townsend (1♂2♀, USNM); W.V. Warner (1♂, USNM). **Georgia:** Peach Co., 29.v.1941, host: *Sehirus cinctus*, (5♀, USNM). **Idaho:** Logan Sport, 10.viii.1915, J.M. Aldrich (1♂, USNM); Moscow, 21.viii.1907 and 12.vii.1912, 8-1.1939, J.M. Aldrich, T.A. Brindley (2♂4♀, USNM). **Indiana:** La Fayette, 26.vi-5.vii.1915/1922, J.M. Aldrich, E.W. Stafford (27♂14♀, USNM, CNCI, BMNH). **Illinois:** Dongola, 11.v.1917 (1♀, AMNH); Peoria, 20.v.1918, J.M. Aldrich (1♂, USNM). **Kansas:** Riley, 21.vi. (1♀, KSUC); Douglas Co., Lone Star Lake, 22.vii.1979, N.E. Woodley (1♂, USNM); Douglas Co., 900ft, R.H. Beamer [Sic Type] (1♂, CNCI); Lawrence, Nat. Hist. Res., 26.v.1956, J.G. Chillcott (1♂, CNCI). **Maryland:** Chespk. Beach, 1927, J.M. Aldrich (1♂, BMNH); Garden City, 1.x.1914, F.B. Milliken, host: *Nysius angustatus*,

(1♀, USNM); Hagerstown, 14.vii.1914 (1♀, USNM); Mg. Co., Ashton (4mi SW), 30.vi.1985, G.F. and J.F. Henel (1♂2♀, USNM); P.G. Co., Camp Springs, 25.viii.1979, G.F. Hevel (1♀, USNM); Plummers Island., 7.vi.1914, W.L. McAtee (1♀, USNM); Prince George Co., 4.vii.1954, C.W. Sabrosky (1♀, USNM). **Michigan:** Ag. Coll. 19.x.1922 (1♂, TAMU); E. Lansing, 3.x.1939. C.W. Sabrosky (5♂, USNM); St. Joseph, 30.v.1938, C.W. Sabrosky (1♂, USNM). **Mississippi:** A & M Coll., 30.xi.1921, 15-28.v.1922 and 11.x-21.xi.1924, H.W. Allen (18♂1♀, USNM). **Missouri:** Charleston, 12.v.1915, ex: *Ceratoma trifucata*, E.H. Gibson (1♂, DEBU); Columbia, 12.viii.1958, ex: Tarnished Plant bugs, (1♀, USNM); Miller Co., Iberia, 16.viii.1964, A.R. Moldenke (18♂12♀, AMNH). **New Jersey:** Clementon, 10.x.1909, (1♀, USNM); Moorestown, 27.viii.1962, ex: *Lygus lineolaris*, F.A. Streams (1♀, USNM). **New Mexico:** Chaves Co., 20 mi NW Kenna, 12.v.1988, N. Jorgensen (1♀, CNCI); Eddy Co., 7 mi SW Jct. Hwy 137 and 285, malaise trap, 18.v.1988, N. Jorgensen (1♀, CNCI); Otero Co., Penasco River, Mayhill (8 mi W), 15.vi.1988, N. Jorgensen (2♂, CNCI); Roosevelt Co., Portales (8 mi NE, 14 mi SW), 1.vi.1976, 21-30.x.1987 and 8.iv.-29.vi.1988, malaise trap, N. Jorgensen (10♂4♀, CNCI); Roosevelt Co., Blackwater Draw nr. Portales, 4,00ft, malaise trap, 24-30.v-1-7.vi.1991, J.E. O'Hara and N. Jorgensen (2♀, CNCI); Hidalgo Co., Rodeo (11mi N), 1.v.1969, Rozen and Favrea (1♀, USNM); Las Cruces, 8.30. T.T. Townsend (3♂, BMNH); Las Cruces, 30.iv.1942, A.L. Melander (2♂, USNM); Rio Bonito, C.H.T. Townsend (1♀, USNM). **New York:** Chittenango, 24.ix.1970, D.J. Peckham (2♂, USNM); Long Island, Babylon, 9.vi.1935, 3.viii.1937, F.S. Blanton, Blanton and Borders (2♀, CUIC); New York City, 7.x.1939, S.C. Marriot (1♀, AMNH). **North Carolina:** Franklin, 2,000ft, 10.vi. 1957, J.R. Vockeroth (1♂, CNCI); Highlands, 18.vii.1957, J.G. Chillcott (1♀, CNCI); Toxaway, 30.viii.1957, W.R. Richards (1♀, CNCI); Wake Co., 22.v.1956, D.G. Dillery (2♂, USNM). **Oklahoma:** Garfield Co., 11.vii.1977, J.F. Reinert (1♂, USNM); Willis, 3-8.vi.1986, D.J. Peckham (7♂6♀, USNM). **Pennsylvania:** Dauphin Co., Grantville, 24.v.1962, J.R. Vockeroth (1♀, CNCI); Philadelphia, 6.v.1895, (1♂, USNM). **South Carolina:** Camp Jackson, 3.xi.1918 (1♂, USNM); Fairfax, 21.v.1932, E.W. Howe (1♀, USNM); St. George, 2.vi.1953, O.L. Cartwright (1♂1♀, USNM); Sumter, 13.x.1916, A.H. Sturtevant (1♀, USNM). **Tennessee:** Indian Gap to Clingman's Dome, 5,200-6,600ft, 6.viii.1957 (1♀, CNCI); Clarksville, 11.vii.1933, D.E. Hardy (1♂, TAMU); Nashville, 5.xi.1915 and 16.vi, J.M. Aldrich, C.C. Hill (1♂1♀, USNM); Oak Ridge, AEC Area, 27.vi.1957, H.F. Howden (1♀, CNCI). **Texas:** Austin, 12.v. (2♂, USNM); Austin, 25.iv.1921, R.H. Painter Coll. (2♀, KSUC); Austin, 8.vi.1979, A.W. Hook (1♂, USNM); Big Bent National Park, Green Gulch, 2,100-5,000ft, 30.iv-21.v.1959, J.F. McAlpine (18♂8♀, CNCI); Blanco Co., Davis Ranch, 23.iv.1959, J.F. McAlpine, W.R.M. Mason (3♂4♀, CNCI); Brewster Co., Lajitas, 19.v.1959, Howden and Becker (1♂, CNCI); College Station, 11.iv. and 4.xi. 1917, 2.vi.1947, 14.vi.1919, 25.iv.1939, 27-29.x.1935, H.J. Reinhard (8♂3♀, TAMU, USNM, CAS, CUIC); Fredericksburg, 16-18.iv.1959, J.F. McAlpine and W.R.M. Mason (2♂3♀, CNCI); Ft. Davis (23-30 mi W), 5,000ft, 28.v-1.vi.1959, J.F. McAlpine (1♂1♀, CNCI);



Hardeman Co., C.E. Royrs (1♀, USNM); Jeff Davis Co., Toyahvale, 22.iii.1967, D.M. Wood (1♂, CNCI); Kerrville, 31.iii-3.iv.1959, J.F. McAlpine (9♂3♀, CNCI); La Salle Co., Artesia Wells, 28.v.1991, D.J. Peckham (2♂, USNM); Liberty (1♀, TAMU); Maverick Co., Quemado, 25.v.1952, M. Cazier etc. (1♀, AMNH); Rocksprings, 25.iv.1959, J.F. McAlpine (1♂1♀, CNCI); Sanderson, 28-29.iv.1959, J.F. McAlpine (1♂1♀, CNCI); Tyler, 14.vi.1938, (1♀, USNM); Victoria, Pridham Lake, 29.v.1913, (1♂1♀, USNM); Willis (1♂, USNM). **Utah:** Moroni, 27.vi.1940, A.L. Melander (1♀, USNM). **Vermont:** Lyden, 13.vi.1914 (1♂, USNM); **Virginia:** Blacksburg, 2,100ft, 23.v.1962, J.G. Chillcott (1♀, CNCI); Falls Chur, 21.vii. C.T. Greene (1♂, USNM); Shenandoah Nat. Park, Thornton Gap, 28.vii.1980, A.E. Stubbs (1♂, BMNH); Tazewell Co., Wardell, 20.v.1965, J.G. Chillcott (4♂1♀, CNCI). **Washington:** Keller, 4.vii.1955, A.L. Melander (1♀, USNM); Spokane, 7.vii.1924, J.M. Aldrich (5♂1♀, USNM); Oroville (1♀, USNM); Pullman, 12.vi.1907 (2♂1♀, USNM). **Wisconsin:** Pateros, 3.viii.1919, A.L. Melander (1♂, USNM). **Doubtful States:** "Alab, 2280, coll. Baker (1♀, USNM)"; "Guyhga Fls., 10.viii.1904, O. W.V. Warner (1♀, USNM)".

## HOSTS

*Sehirus cinctus* Palisot (Hemiptera, Cydnidae): - USA (CA, GA) (Brooks 1945: 676; - Arnaud 1978: 283).

*Nysius angustatus* Uhler (Hemiptera, Lygaeidae): - USA (KS) (new record).

*Lygus lineolaris* (Palisot de Beauvois) (Hemiptera, Miridae): - USA (MO, NJ) (new record).

### 3.5.11 *Phasia pusilla* Meigen, 1824

(Figures I-48, II-4.3)

*Phasia pusilla* Meigen, 1824: 198.

*Phasia semicinerea* Meigen, 1824: 199.

*Hyalomyia carbonaria* Robineau-Desvoidy, 1830: 300.

*Hyalomyia corinna* Robineau-Desvoidy, 1830: 301.

*Phasia vitripennis* Zetterstedt, 1859: 6169.

*Hyalomyia chorea* Robineau-Desvoidy, 1863: 266.

*Alophora (Paralophora) pusilla*: Girschner, 1887: 38 - Rohdendorf 1947: 86.

*Alophora (Paralophora) pusilla*: Brauer and Bergenstamm, 1889: 149.

*Alophora (Parallophora) pusilla*: Bezzi and Stein 1907: 583.

*Alophora pusilla*: - Baer 1921: 127 - Stein 1924: 259 - Rohdendorf 1933: 712 - Belanovskij 1951: 143 (in part) - Emden 1954: 27.

*Alophora pusilla*: - Lundbeck 1927: 98.

*Parallophora pusilla*: - Wainwright 1928: 244.

*Hyalomyia pusilla*: - Townsend 1938: 57.

*Parallophora (Paralophora) pusilla*: Day 1948: 41.

*Hyalomyia (= Paralophora) pusilla*: Dupuis 1949: 536 - Dupuis 1963: 105 (biology).

*Parallophora pusilla*: Mesnil 1953: 176.

*Alophora (Hyalomyia) pusilla*: Draber-Mořko 1965: 89 (redescription, host).

*Alophora (Hyalomya) pusilla*: - Crosskey 1976: 166 (catalog), 291 (host catalog).

*Phasia (Hyalomyia) pusilla*: - Herting 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 413 (catalog) - Zielger 1994: 173 (review, biology).

## DESCRIPTION

Body length: 3-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta black or brown. Frontal vitta at base of antennae 1.7-1.8 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.0-1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 2.0-2.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena black with grey pruinosity; hairs black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.3-0.4. Length of oral opening 2.0-2.1 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum thinly pruinose, with fine black hairs. 0+1 acrostichal seta; 0+1(2) dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae strongly, black; 1 katapisternal seta; 6-9 meral setae. Scutellum black, thin grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow, or brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws black, 0.9-1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *a*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 4-6 *ad* and 4-5 *pd*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.7. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III silvery (at least on posterior 3/4). Pruinosity of tergites IV, V silvery; hair spots distinct. **TERMINALIA.** Syncercus broad, with a deep and wide V-shape notch posteriorly. Surstylus flattened laterally, straight, apex broadened, longer than cercus. Ejaculatory apodeme small. Hypandrium as long as phallapodeme. Pregonite even, haired ventrally. Postgonite long, pointed. Phallus slender, slightly shorter than hypandrium, densely haired dorsally. Distiphallus partly sclerotized.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus; not touching. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) longer than sternite VI, pointed apically, bent, apex directed ventrally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Phasia pusilla* Meigen, 1825. Holotype ♂, GERMANY, Nordrhein, Stolberg [MNHN (Paris) according to Townsend 1938:57, but specimen in CNCI is labeled as "Type Meigen [pink label]/*Alophora pusilla*, A.M.; ♂, ex: L.P. Mesnil Collection, 1985)" probably is the type].

#### OTHER MATERIAL EXAMINED

**ALBANIA.** Albanien Exp. DEIC, Dajti, Westhang, 1,100m, 17-22 and 29.vi.1961.(11♂9♀, DEIC). **AUSTRIA.** Bergand Kittsee, nr. Hainburg, 4.x.1964, C.R. Vardy (1♀, BMNH); Kaltenleutgb. A.I, 14.vii.1918, Gurti (1♂, DEIC); Sudsteierrn, Strobl (1♀, BMNH); Tyrol, Obergurgl, 12.viii.1969, A.C. and B. Pont (1♀, BMNH). **CHINA.** Manshukuo, Sjaolin and Chandaochezsy, 25.v.1939 and 25.viii.1951, W.Alin (4♂4♀, DEIC). **CROATIA.** Sljama, 30.v.1930 (1♀, CNCI); Zagcel, 2-20.vii.1920, N. Baranov (5♂, CNCI); Zagub, 14.ix.1929 (2♂, CNCI). **CYPRUS.** Yermasoyla River, 7.iii.1952 (1♂, BMNH). **DENMARK.** Dania, NEZ UB38, Ganlose Orned, 17.ix.1977, S. Andersen (1♂, CNCI); Dania, NEJ NJ30 Himmerlandske Heder, 30.v.1977, S. Andersen (1♂, CNCI). **ENGLAND.** Aston, Rowant, 30.vii.1927, (C.J. Wainwright's Collection, B.M. 1948-488" (1♀, BMNH); Chippenham, Fen., 19.v.1929 (C.J. Wainwright's Collection, B.M. 1948-488) (1♂, BMNH); Kent, Faversham, 4.viii.1907, A.J. Chitty (3♂, CNCI); Oxfordshire, Stockenchureh, 17.viii.1896" (1♀, BMNH); Slindon, Sx., 20.vii.1951, G.E. Shewell (5♂1♀, CNCI); Salisburg Witts, 17.viii.1959, J.R. Vockeroth (1♀, CNCI); Tring, 20.viii.1933 (C.J. Wainwright's Collection, B.M. 1948-488) (1♂, BMNH); Wvre Forest, 22.vii.1911, (C.J. Wainwright' Collection, B.M. 1948-488) (1♂, BMNH). **FRANCE.** Beaulieu, Correze, 12-19.vii.1950, P. Vanrie (1♂, AMNH); Cassis, Bouches, d. Rhone, 3.7.1931, Richards (1♂, BMNH); Cernay, 15.v.1950, H.L. Parker (1♀, USNM); Corsica, Vivario, 650m, 21.vii.1963, D.H. and D.J. Harvey (B.M. 1963-477) (35♂1♀, BMNH); Corsica, Cap Corse, Nonza, 100m, 15.vii.1963, D.H. and D.J. Harvey (B.M. 1963-477) (1♀, BMNH); Var. Le Frayer, 29.vi.1958 (1♂, BMNH); Rambouillet, 16.vii.17, Shannon and Shannon (2♂, USNM); Rweil, 7.viii.1951, H.L. Parker (1♀, USNM); Saint Germain, 17.v.1950, H.L.Paker, Swept (3♂, USNM). **GERMANY.** Berlin, Lichtwardt, Jungfernheide, Finkenkrug and Wannsee etc. 3.vii.1898, 9. vii.1900, 21.ix.1912, 15.v.1904, 20.v.1900, 24.ix.1909, 12.ii.1913, 13.viii.1905, 22.viii.1902, 29.v.1899, 9.ii.1900, 20.v.1908, 18-20.viii.1905, (7♂12♀, DEIC); Brachwitz (?), 31.vii. (1♂, DEIC); Bruch flol. (?), 20.vii. (1♀, DEIC); Frankfurt Oder, coll. Lichtwardt (1♂, DEIC); Frankfurt Oder, M.P. Riedel, Reinhard Collection (2♂4♀, CNCI); Halle Saale, 5.viii.1936, Kirschberg (1♂,

DEIC); Halle, (1♂, DEIC); Marburg i H, 7.ix.1898, coll. Liehtwardt (1♀, DEIC); Potsdam, 1.vi.1919, coll. Liehtwardt (1♀, DEIC); Potsdam, (2♂, DEIC); Petzow, 1.ii.1905, (1♂, DEIC); Stromberg Hansrück Antrocknem Halm Riedel (1♂, CNCI); Schildhorn, 15.vii.1898, Oldenberg (1♂, DEIC); Spanwan (?), 24.viii.1902, coll. Liehtwardt (1♂, DEIC); Sülldorf, 5.x.1917, coll. Oldenberg (1♂, DEIC); Sachsen, Genthin, 9.ix.1896, P. Stein (1♀, ZMHU); Siebenb, Neustadt, Brunzhugel, 25.vi.1905, E.J. Lehmann (1♀, ZMHU). **GREECE.** Crete, 4km NW Plantanos, 25.iv.1980 (1♀, BMNH); Crete, W side of Hania and Elounda, 24.iv.1980 (2♂4♀, BMNH); Crete, Georgioupolis, 8.v.1986, D.M. Ackland (1♀, BMNH); Crete, Elounda, 7.v.1979, D.M. Ackland (18♂, BMNH); Macedonie, Struma Vall., iv.1974, Shannon and Hadjinicalacu (1♂, USNM); Samothrace, Therme, S.L. 17.viii.1963, Guichard and Harvey (5♂, BMNH). **HUNGARY.** Baja, 29.vi.1925, (2♂2♀, USNM); Maglod, 14.v.1895 (1♀, USNM); Pecel, det by Bischof (1♀, USNM); Szár, 15.vi.1902, coll. Liehtwardt (1♀, DEIC); Torbagy, Z. Szilady (1♂, USNM); Ungarn, (1♂1♀, DEIC); Vecs, 30.v.1928 and 13.v.1930 (2♀, USNM). **ISRAEL.** Latroun, 29.ii.1968, S. Bleszynski (1♀, CNCI); Kefar Shemuel, 12.iv.1968, S. Bleszynski (1♂, CNCI); Haifa, 30.v.1980, A. Freidberg (1♂, CNCI). **ITALY.** Sassuolo-Emilia, viii.1922, C. Minozzi (1♂, BMNH). **JAPAN.** Hirosaki C. Jyoto, 26.v.1974, S. Fukushi (1♂, BLKU); Mt. Iwaki, Sakurabayashi, 4.vii.1970, S. Fukushi (1♀, BLKU); Obihiro, S Takano, Ex: L.P. Mesnil Collection (1♀, CNCI); Sapporo, S. Matsumura (4♀, USNM). **LATVIA.** Kurland, ch. Siebert (1♀, DEIC); **MOROCCO.** Middle Atlas, 10.v.1961, P.N. Lawrence (1♀, BMNH). **NORWAY.** Eidskog, Norwegen Strand (1♂, CNCI). **PALESTINE.** Deir El-Belah, 8m SW Gaza, 21.iv.1917, M.E.E. Austen (1♂, BMNH). **POLAND.** Bromberg, O. Meyer (1♂2♀, CNCI, AMNH); Ur. Mnichow, 9.7. 1961, A. Mońko (1♂, USNM); Schlesien, Letzner (2♂, DEIC); Urocz. Sokotowm D., 7.vii.1961, A. Mońko (1♀, USNM). Wölfslgrd, 13.ii.1905, (1♀, DEIC). **PORTUGAL.** Cascaes, 9.iii.1896 (3♀, BMNH); Lousa, 8.vii.1960, N.L.H. Krauss (1♀, USNM); Lisbon, 22.vii.1962 (1♀, BMNH). **ROMANIA.** Mehadia, 8.vi.1904, coll. Liehtwardt (3♂, DEIC); Mehadia, coll. Oldenberg (1♀, DEIC); Orsova, coll. Liehtwardt (1♂, DEIC); Valachie comana, X.C. Toulaudou (1♂, BMNH). **SERBIA.** Golubar (?), 21.iv.1925, N. Baranov (1♂, USNM). **SLOVAKIA.** Pöstyén, 24.v.1902, coll. Liehtwardt (2♀, DEIC). **SPAIN.** Lerida, 6 km NW Llavorsi, 30.vi and 1.vii. 1992, Tschorsnig (2♂1♀, DEBU); Caceres so Guadalupe, 8.vi.1989, Tschorsnig (1♀, DEBU). **SWEDEN.** Stockholm, 12.vii.1953, C.W. Sabrosky (1♀, USNM). **SWITZERLAND.** Wallis ob Pfywald (1♀, CNCI). **USSR (RUSSIA).** Siberia, Novosibirsk Region, Chany Lake Biological Station, on flowers, 1-5.vii.1991, S.A. Marshall (128♂25♀, DEBU, LACM); Primor'ye Ussuriysk Reserve 140-160m, Camp., 20.vii.1990, T. Saigusa (1♂1♀, BLKU). **DOUBTFUL LOCALITIES:** "Farley, 6.8.30" (1♀, AMNH); "Quy Fen, Cambs., 17.viii.1921, F.W.Edwards, Brit. Mus. 1922-33" (1♀, BMNH); "Nousy le Roi, 15.viii.1935, det by Mesnil" (1♀, CNCI); "Reuilbeaue, 24.vi.1941, det by Mensil" (1♀, CNCI); "Bagley Wood" 13.vii.1930" (6♂3♀, AMNH); "Ex Coll. J.H.Wood. Brit.Mus 1948-560" (5♂1♀, BMNH); "Mqcerata 14.iv.1996,

7.v.1996, 27.vi.1995" (3♂, USNM); "Lintofle (?), 25.vii.1915" (1♂1♀, USNM); "Slyria, A.L. Melander's Collection 1961" (1♂, USNM); "Tizi-n-zou, Trib, B.L., 1,000-2,500m, N of Source, 8.viii.1963, (1♀, BMNH)"; "Mqcuet, 9.iv.1896, (1♂, BMNH)"; "ex: Girschner Collection, C.J. Wainwright Coll., B.M. 1948-488, (5♂5♀, BMNH)".

## HOSTS

*Chilacis typhae* (Perr.) (Hemiptera, Lygaeidae): - (Hesse 1927- Michalk 1935 - Dupuis 1963: 105 - Draber-Mońko 1965: 87).

*Aethus nigrinus* (Fabr.) (Hemiptera, Cydnidae): - (Michalk 1938 - Otten 1940: 324 - Dupuis 1963: 105 - Draber-Mońko 1965: 87).

*Stollia inconspicua* (H.S.) (Hemiptera, Pentatomidae): - (Viktorov and Kozharina 1961: 53 - Dupuis 1963: 105).

*Stollia aenea* (Scopoli) (Hemiptera, Pentatomidae): - (Viktorov and Kozharina 1961: 53 - Dupuis 1963: 105).

*Lycocoris campestris* (F.) (Hemiptera, Anthocoridae): - (Dupuis 1963: 105).

*Anthocoris sarothamni* Douglas and Scott (Hemiptera, Anthocoridae): - (Dupuis 1963: 105).

*Anthocoris nemoralis* (F.) (Hemiptera, Anthocoridae): - (Dupuis 1963: 105).

*Nysius cymoides* (Spinola) (Hemiptera, Lygaeidae): - (Dupuis 1963: 105).

*Nysius lineatus* (Costa) (Hemiptera, Lygaeidae): - (Dupuis 1949: 223, 1963: 105 - Draber-Mońko 1965: 87).

*Cymus grandicolor* Hahn., (Hemiptera, Lygaeidae): - (Dupuis 1963: 105 - Draber-Mońko 1965: 87).

*Kleidocerus ericae* (Horv.), (Hemiptera, Lygaeidae): - (Dupuis 1963: 105 - Draber-Mońko 1965: 87).

*Nysius jacobaeae* (Schill.) (Hemiptera, Lygaeidae): - (Dupuis 1963: 105 - Draber-Mońko 1965: 87).

*Bagrada hilaris* (Burm.) (Hemiptera, Pentatomidae): - (Anwar Cheema et al 1973 - Crosskey 1976: 291).

## NOTES

*Phasia pusilla* is distributed in Europe northwards to Scotland, middle Sweden and St. Petersburg, and is also recorded from Palestine, Transcaucasia, Kazakhstan, southern Siberia, Russian Far East, Mongolia and Japan (Herting 1984: 170).

### 3.5.12 *Phasia robusta* (Brooks, 1945)

(Figures I-50, II-5.2)

*Hyalomyiopsis robusta* Brooks, 1945: 678.

*Hyalomya robusta*: Sabrosky and Arnaud 1965: 969 (catalog).

**DESCRIPTION**

Body length: 7-10 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black, silky grey pruinose. Frontal vitta black, silky pruinose. Frontal vitta at base of antennae 1.0-1.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.1 times as wide as first flagellomere. Lower margin of face slightly projecting, visible in profile, orange yellow, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1-1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena brown and black with grey pruinosity; hairs white; height 0.12-0.15 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1-1.2 times as long as pedicel; arista thickened on basal 0.2. Length of oral opening 1.7-1.8 times its width. Occiput slightly convex; white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+0(1) acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 1 katepisternal seta; 5-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline; petiole of apical cell 0.3-0.35 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur slightly swollen, black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws brown to black; 1.0-1.1 times as long as fifth tarsomere. Pulvilli brown to black. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1 *pv*, 2 *p* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black; with one row of strong *ad* setae and 1-3 *v*.

**ABDOMEN.** Abdominal tergites black; pruinosity silvery; longitudinal vitta distinctly present (but interrupted between tergites). Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.5:1.1:1:0.7. Syntergite I+II shiny, not pruinose. Pruinosity of tergites III, IV evenly; hair spots distinct. **TERMINALIA.** Syncercus V-notched posteriorly, apex strongly bent ventrally into pointed hook-like. Surstylus broad, slightly arched dorsally, longer than cercus. Ejaculatory apodeme small. Hypandrium broad, strongly wavy ventrally, shorter than phallapodeme. Epiphallus well developed. Pregonite triangular. Postgonite longer than pregonite, pointed, bent ventrally. Phallus broad, and long, 1.4-1.5 times as long as hypandrium, densely haired on basal 1/2. Distiphallus partly sclerotized, apex bent.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus; not touching. Anterior spine-like setae of hind tibia well developed (2-3 rows). Sternite VII (sheath) as long as sternite V, tapered, beak-like apically in profile, pointed apically, not bent, apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyiopsis robusta* Brooks, 1945. Holotype ♂, [USA], Oregon, Grant Co., Summit Prairie, 5,500ft. 7.viii.1941 (CNCI, examined); allotype ♀, same holotype (CNCI, examined); paratypes: 2♂1♀, same as holotype (CNCI, examined); 2♂, [USA], Colorado, Lump Gulch, near Gilpin, 8.viii.1934, H.G. Rodeck (CNCI, examined); 2♂1♀, [USA], Colorado, Boulder, 5.vi.1932, M.T. James (CNCI, examined); 1♂, [USA], Colorado, 25.viii.1931, J.R. Reinhard (CNCI, examined); 1♂, [USA], [California], Alameda Co., Berkeley, 27.vii.1910, J.C. Bridwell (USNM, examined); 1♂, [USA], California, San Diego Co., (USNM, examined); 1♀, [USA], Colorado, (?), No. 1601, (USNM, examined); 1♂2♀, [USA], Idaho, Moscow, 4-5.iv.1908, 26.viii.1912, J.M. Aldrich (USNM, examined); 1♀, [USA], Utah, Salt Lake, 20.x.1913, L.P. Rockwood (USNM, examined). 1♂, [USA], Utah, Logan, 8.vi.1931 (CNCI, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Alberta:** Onefour, 3.vi.1956, E.E. Sterns (1♀, CNCI). **USA. Arizona:** Bill Williams Fork, August, F.H. Snow (1♀, BMNH). **California:** Humboldt Co., Beatrice, 30.vi.1940, B.P. Bliven (1♀, CASC); Monterey Co., Hastings Reserve, 26.vi.1975, R.B. Root, host: *Lygaeus kalmii* adult, (1♀, CUIC). **Colorado:** Ameron Pass, 7.vii.1931, (1♀, AMNH); Boulder, 5,000ft, 1-16.vi.1961, B.H. Poole (8♀1♂, CNCI); Buena Vista, 7,800ft, 22-23.vi.1961, C.H. Mann (3♀, CNCI); Clear Creek Co., Chicago Cr., 8,800ft, 2.viii.1961, S.M. Clark (1♀, CNCI); Estes Park, 7,500ft, 14.viii.1961, B.H. Poole (1♂, CNCI); Crowleg, 1.ix.1932, M.T. James (1♂2♀, CNCI); Denvet, vii (1♀, BMNH); El Paso Co., 19.viii.1959, N. Marston (1♀, KSUC); Fort Garland, Mt. Home Lake, 25.vii.1969, L.L. Pechuman (1♀, CUIC), Larimer Co., 13.viii.1959, N. Marston (2♂, KSUC); Golden, 7,400ft, 31.vii.1961, W.R.M. Mason (1♀, CNCI); Golden, 20.iii., Stoner (1♀, USNM); Larimer Co., Estes Park, 13.vii. 1934, 20.vii-14.viii.1961, 8.viii.1974, A.L. Melander, C.H. Mann, B.H. Poole, M and T.M. Favreau (2♂2♀, USNM, AMNH); Mt. Evans, 12,000ft, 7.viii.1961, S.M. Clark (2♀, CNCI); Mt. Evans, Doolittle Ranch, 9,800ft, 3.viii.1961, J.G. Chilcott (1♂3♀, CNCI); Nederland, Science Lodge, 9,500ft, 6.vii.1961. B.H. Poole (2♂6♀, CNCI); Pingree Park, 15-17.viii.1934, 2-7.vi.1939, C.W. Sabrosky etc. (4♂4♀, USNM); Poncha Springs, (7mi N.), 7,500ft, 22.vi.1961, W.R.M. Mason (2♀, CNCI); Prowers Co., 28.viii.1959 and 7.vi.1962, N. Marston (1♂5♀, KSUC); Prowers Co., 3 mi W. Hartman, 6.vii.1961, N. Marston (1♂1♀, KSUC); Ward, 10.vii.1937, M.T. James (1♀, CNCI); Yuma Co., 4mi N.E. Idalia, 10.viii.1964, J.G. and B.C. Bozen (1♀, AMNH). **Kansas:** Douglas Co., Lawrence, 1.xi.1976, S.W. Hamilton (1♀, USNM); Stevens Co.,

7.vi.1940, R. Fritz (1♀, KSUC). **Montana:** Yellowstone Co., Pompeys Pillar, 6 Mt. N.E., 9.viii.1962, J.G. and B.L. Rozen (1♂, AMNH). **Nebraska:** Snake Falls, 8-5-1931, Reinhard (1♂, CNCI). **New Mexico:** Las Cruces, 6.3. Coll. Townsend (1♀, BMNH); Chaves Co., Kenna (13 mi SW), 13.v.1976, N. Jorgensen (1♀, CNCI); Lincoln Co., Encinosa (7 mi E), 7.vii.1988, N. Jorgensen (1♂, CNCI); Roosevelt Co., Portales (5 mi N, 8 mi NE and 8 mi W), 10.v.1976, 17.v.1972 20-28.x.1987, 6-13.iv.- 15.vi.1988, N. Jorgensen (28♂19♀, CNCI); San Miguel Co., 5 mi W Sapello, 27.v.1976, N. Jorgensen (1♂, CNCI); Rio Bonito, T.T. Townsend (4♀, BMNH); Roosevelt Co., Portales, 28-30.x.1987, N. Jorgensen (1♂1♀, CNCI). **North Dakota:** East, 1941, (1♀, CNCI). **Oregon:** Corvallis, 15.xi.1941, H.J. Ostlind, host: *Lygaeus kalmii* (1♀, USNM). **Texas:** Armstrong Co., Palo Dura Canyon, 22mi S Claude, 4.iv.1979, R.J. McGinley (1♀, USNM); Blanco Co., (N.W.), Davis Ranon, 23.iv.1959, J.F. McAlpine (1♂, CNCI); Big Bend N.P., Oak Spring, 4,500ft, 1.v.1959, J.F. McAlpine (1♂, CNCI); College Station, 19.x.1917, H.J. Reinhard (1♂, CASC); Fredericksburg, 18.iv.1959, J.F. McAlpine (2♂, CNCI).

#### HOST

*Lygaeus kalmii* Stal. (Hemiptera, Lygaeidae): - USA (OR, CA, KS)( new record).

#### 3.5.13 *Phasia siberica* Sun, sp. nov.

(Figures I-56, II-5.1)

#### TYPE MATERIAL

Holotype ♀, U.S.S.R. [Russia], Siberia, Novosibirsk Region, Chany Lake Biological Station, near Zdvensk, on flowers, 1-5.vii.1991, S.A. Marshall (CNCI).

#### DESCRIPTION

Body length: 6.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black, shiny grey pruinose. Frontal vitta triangle, black. Frontal vitta at base of antennae 2.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.6 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.5 times as long as pedicel; arista thickened on basal 0.35. Length of oral opening 1.8 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 across-



tichal seta; 2 postpronotal setae; presutural supra-alar seta present, strong; postsutural intra-alar seta absent; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae hair-like, black; 1 katapisternal seta; 5-6 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws black; 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black; with one row of *ad* and *pd*. Anterior spine-like setae of hind tibia well developed.

**ABDOMEN.** Abdominal tergites black. Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:1.1; relative width I+II:III:IV:V = 0.6:1:1:0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III greyish yellow; median area shiny anteriorly. Pruinosity of tergites IV, V greyish yellow; hair spots indistinct. Sternite VII (sheath) longer than sternite VI, tapered, pointed apically, not bent, apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

## HOST

Unknown.

## ETYMOLOGY

The name *Phasia siberica* reflects the fact that this species is known only from Siberia.

### 3.5.14 *Phasia truncata* Herting, 1983

(Figures I-65, II-4.2)

*Phasia (Hyalomyia) truncata* Herting, 1983: 7, 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 413 - Ziegler 1994: 160 (review).

## DESCRIPTION

Body length: 3-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta black with grey pruinosity. Frontal vitta at base of antennae 1.8-2.0 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical

setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown to black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs white, or black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.5-1.6 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 2.1-2.2 times its width. Occiput flattened, white pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum shining, without pruinosity, with fine black hairs. 0+1 acrostichal seta; 0(1)+1 dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 post-alar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae medium size, black; 1 katepisternal seta; 7-9 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarsus black. Fore claws black, 0.9-1 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *a*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, slightly arched, with 1 *a*, one row of *ad* and *pd*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1; relative width I+II:III:IV:V = 0.4:1:1:0.7. Syntergite I+II shiny, not pruinose. Pruinosity of tergites III, IV and V silvery; hair spots distinct. **TERMINALIA.** Syncercus broad, U-notched posteriorly. surstylus flattened, longer than cercus; broadened on apical half, arched dorsally. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallapodeme. Pregonite even, with two small teeth posteroventrally. Postgonite triangular, pointed, bent ventrally. Phallus as long as or shorter than hypandrium, not haired dorsally. Distiphallus broad, membranous.

**FEMALE.** Wing hyaline. Eyes almost touching. Femora swollen. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) shorter than sternite VI, broad apically, slightly bent, apex directed dorsally, rectangular in lateral view, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Phasia (Hyalomyia) truncata* Herting, 1983. Holotype ♀, SPAIN, Huelva, Las Marismas, El Rosio, 3m, 22.vii.1979, W. Schacht (SMNS, not examined); paratype 1 ♀, same as holotype (DEBU, Tschorsnig's *per. comm.*, treated as paratype).

**OTHER MATERIAL EXAMINED**

**PORTUGAL:** Marinha Grande, Estremadura, vi.1966. N.L.H. Krauss (1♀, USNM).  
**SPAIN:** Estaotit, 16.vi.1966, C.N. Cokicr (1♀, BMNH). Huelva El Rocio, 10m, 13.vii.1975, W. Schacht (3♀, BMNH); Huelva, Mazagón, 30. Mal. 1983, Tschorsnig (1♂1♀, DEBU); Santiago, de Compostela, Coruna ix.1966. N.L.H. Krauss (1♀, USNM).

**HOST**

Unknown.

**NOTES**

*Phasia truncata* was originally described from female specimens only.

**3.5.15 *Phasia venturii* (Draber-Moňko, 1965)**

(Figures I-67, II-5.1)

*Alophora (Hyalomyia) venturii* Draber-Moňko, 1965: 101.

*Paralophora aethiopica* (Bezzi) of Mesnil, 1953: 177 (misident).

*Phasia (Hyalomyia) venturii*: Herting 1984: 170 (catalog) - Herting and Dely-Draskovits 1993: 413 (catalog) - Ziegler 1994: 160 (review).

**DESCRIPTION**

Body length: 3-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black, silky grey pruinose. Frontal vitta triangular, black. Frontal vitta at base of antennae 1.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.6 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.6 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/7. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.3-1.4 times as long as pedicel; arista thickened on basal 0.35. Length of oral opening 2.2-2.4 times its width. Occiput flattened, white pruinose; hairs black.

**THORAX.** Mesoscutum strongly pruinose, with fine black hairs. 0+0(1) acrostichal seta; 0+1 dorsocentral seta; 0-2 postpronotal setae; presutural supra-alar seta present, but fine; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron shining; hairs black. Anepimeral setae medium size, black; 1 katepisternal seta; 6-9 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without

scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown to black. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws black, 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, slightly arched, with 3 *pd* and 3 *ad*.

**ABDOMEN.** Abdominal tergites black; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.9. Syntergite I+II matte black, shining, not pruinose. Tergite III shiny. Pruinosity of tergites IV, V silvery; hair spots distinct. **TERMINALIA.** Syncercus V-notched posteriorly. Surstylus broad, longer than cercus; apex broadened, arched dorsally. Ejaculatory apodeme extremely long, 0.5 times as long as hypandrium. Hypandrium shorter than phallapodeme. Pregonite reduced. Postgonite long, forked and pointed, with sparse hairs ventrally. Epiphallus distinct. Phallus shorter than hypandrium, not haired dorsally. Distiphallus with regular sawteeth.

**FEMALE.** Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia present. Sternite VII (sheath) longer than sternite VI, tapered, pointed apically, not bent, apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora (Hyalomyia) venturii* Draber-Mońko, 1965. Holotype ♀, TUNISIA, Bou Hedma, v.1929, C. Dumont, "*Alophora (Paralophora) venturii* nom.nov. det. A. Mońko 1961" ex: Mesnil Collection (CNCI, examined); allolectotype, 1♂, TUNISIA, v. 52735 (HUMB, examined); paratypes, 1♂1♀, TUNISIA, v. 52735 (HUMB, examined).

#### OTHER MATERIAL EXAMINED

**ALGERIA.** Biskra, 28.v.1894, A.E. Eaton (1♂, BMNH). **MOROCCO.** Asni, 1.vi.1928, R. Benoist (2♀, CNCI). **SPAIN.** Salamanca, Villar de Ciervo, 20.vi and 7.vii. 1990, Tschorsnig (3♂1♀, DEBU).

#### HOST

Unknown.

#### NOTES

*Phasia venturii* (Draber-Mońko) is recorded from Algeria, Morocco, Spain, Greece and Tunisia.

### 3.6. The *Phasia subcoleoprata* species-group

The *Phasia subcoleoprata* species-group includes part of the subgenus *Phasia sensu* Herting 1984.

**Diagnosis:** Head compressed anteriorly or spherical; eyes separated by a distance usually larger than ocellus; fronto-orbital plate with 1-3 rows of hairs laterally, never swollen; dorsal facets of eyes larger than ventral facets; inner margins of eyes parallel. Parafacial bare; lower margin of face perpendicular or projecting; Sublunular bulla indistinct. First flagellomere short; oral opening short. Thorax black, scale-like setae absent. Scutellum with two pairs of marginal setae. Abdomen subovate, black or with yellow spots. Female sternite VII variable in shape.

#### Key to species of the *Phasia subcoleoprata* species-group

(The males of *Phasia africana*, *Phasia australiensis*, *Phasia cana*, *Phasia clavigralla*, and the females of *Phasia lauta*, *Phasia malayana*, *Phasia subnitida* are unknown)

1. Female ..... 2
- Male ..... 15
2. One katepisternal seta; sternite VII abruptly bent ventrally ..... 3
- Two or more katepisternal setae; sternite VII bent dorsally or straight, or gradually bent ventrally ..... 6
3. Mesoscutum black, shining, extremely flattened; Australian species .....  
..... *P. hippobosca* (Paramonov, 1958) ♀
- Mesoscutum pruinose, never flattened ..... 4
4. Tibia, and usually femora yellow, at least tibia; thorax and abdomen greyish yellow pruinose  
..... *P. fenestrata* (Brooks, 1945) ♀
- Tibia and femora black; thorax and abdomen grey pruinose ..... 5
5. Eyes separated by a distance equal or greater than width of ocellar triangle; Nearctic species  
..... *P. albipennis* (Brooks, 1945)
- Eyes separated by a distance less than width of ocellar triangle; Palearctic species ....  
..... *P. subcoleoprata* (Linnaeus, 1767) ♀
6. Apex of sternite VII broad in ventral view ..... 7
- Apex of sternite VII pointed or very narrow in ventral view ..... 9
7. Sternite VII knobbed (Fig. I-15.4) ..... *P. clavigralla* Sun, new species ♀
- Sternite VII not knobbed ..... 8
8. Sternite VII bent ventrally (Fig. I-2.3) ..... *P. africana* Sun, new species ♀
- Sternite VII almost straight (Fig. I-38.7) ..... *P. nasalis* (Bezzi, 1908) ♀
9. Abdomen with yellow patch or dark yellow spots ..... 10
- Abdomen totally black ..... 12

10. Wing pictured; sternite V longer than sternite VI; apex of sternite VII hook-like ..... *P. multisetosa* (Villeneuve, 1923) ♀  
 - Wing hyaline; sternite V not longer than sternite VI; apex of sternite VII not hook-like ..... 11
11. Sternite VII short, 1.4 times as long as sternite VI (Fig. I-58.6-7) ..... *P. singuliseta* Sun, new species ♀  
 - Sternite VII long, 1.6-1.7 times as long as sternite VII (Fig. I-2.3-4) ..... *P. cana* Sun, new species ♀
12. Sternite VII extremely laterally flattened on apical half (Fig. I-9.3-4) ..... *P. australiensis* Sun, new species ♀  
 - Sternite VII not or only slightly flattened on apical half ..... 13
13. Mesoscutum shining, without pruinosity ..... *P. woodi* Sun, new species ♀  
 - Mesoscutum pruinose, with distinctly black longitudinal vittae ..... 14
14. Lower margin of face perpendicular, not projecting; abdomen and gena usually greyish yellow pruinose ..... *P. chilensis* (Macquart, 1851) ♀  
 - Lower margin of face projecting; abdomen and gena usually grey pruinose ..... *P. rufiventris* (Macquart, 1851) ♀
15. One katepisternal seta ..... 16  
 - Two or more katepisternal setae ..... 20
16. Tergites shining, without pruinosity ..... 17  
 - Tergites pruinose, if shining, then wing pictured ..... 18
17. Mesoscutum shining, extremely flattened; wing pictured; lower margin of face projecting, visible in profile; phallus short; surstylus not broadened; syncercus deeply notched posteriorly ..... *P. hippobosca* (Paramonov, 1958) ♂  
 - Mesoscutum pruinose, not flattened; wing hyaline; lower margin of face perpendicular, not projecting; phallus long; surstylus broadened; syncercus shallowly notched posteriorly ..... *P. lauta* Sun, new species ♂
18. Mesonotum greyish yellow pruinose; legs, at least tibia yellow or brown ..... *P. fenestrata* (Brooks, 1945) ♂  
 - Mesonotum grey pruinose; legs black ..... 19
19. Distiphallus with a pair of strong saw tooth and several small saw tooth; Nearctic species ..... *P. albipennis* (Brooks, 1945) ♂  
 - Distiphallus with a row of regular small saw tooth only; Palaearctic species ..... *P. subcoleoprata* (Linnaeus, 1767) ♂
20. Scutellum yellow ..... 21  
 - Scutellum black ..... 22
21. Apex of surstylus strongly bent dorsally; cercus short and broad (Figs. I-60.5) ..... *P. subnitida* Sun, new species ♂  
 - Apex of surstylus dorsoventrally flattened; cercus slender (Figs. I-37.3-4) ..... *P. multisetosa* (Villeneuve, 1923) ♂

22. Lower margin of face perpendicular, not projecting ..... 23  
 - Lower margin of face projecting ..... 24
23. Mesoscutum densely pruinose, with longitudinal vittae; syncercus deeply notched posteriorly; phallus membranous..... *P. chilensis* (Macquart, 1851) ♂  
 - Mesoscutum not distinctly pruinose; syncercus shallowly notched posteriorly; phallus node-like, partly sclerotized ..... *P. malayana* Sun, new species ♂
24. Phallus long, haired, apex ball-like ..... 25  
 - Phallus short, not haired, apex branched or pointed ..... 26
25. Cercus slender; surstylus not arched ..... *P. nasalis* (Bezzi, 1908) ♂  
 - Cercus short; surstylus arched dorsally ..... *P. singuliseta* Sun, new species ♂
26. Syncercus broad, deeply notched posteriorly; surstylus not broadened; apex of distiphallus pointed, not branched ..... *P. woodi* Sun, new species ♂  
 - Syncercus slender, not notched posteriorly; surstylus broadened; apex of distiphallus branched ..... *P. rufiventris* (Macquart, 1851) ♂

### 3.6.1 *Phasia africana* Sun, sp. nov.

(Figures I-2.1-4, II-7.4)

#### TYPE MATERIAL

Holotype ♀, [SOUTH AFRICA]. Willowmore, Capland, Dr. Brauna, [ex: A.L. Melander Collection 1961] (USNM); paratypes, 4♂, [SOUTH AFRICA], Willowmore, Capland, 12.i.1917 and 20.x.1921, Dr. Brauns (NMSA); 1♀, [SOUTH AFRICA], Natal, Willow Grange, 3.v.1914, B.C. Wroughton (BMNH); 1♀, [SOUTH AFRICA], Namaqualand [?], Knersvlakte (BMNH).

#### DESCRIPTION

Body length: 8-9 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black with grey pruinosity; 2 rows of hairs laterally. Frontal vitta reddish brown, divergent. Frontal vitta at base of antennae 1.5-1.6 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face brown and black with grey pruinosity. Parafacial brown and black with grey pruinosity, bare, as wide as first flagellomere. Lower margin of face perpendicular, not projecting, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.4 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule normal; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.4 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly pruinose, without distinct black longitudinal vitta,

with fine black hairs. Acrostichal setae 0+1; 1 postpronotal seta; presutural supra-alar seta absent; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and brown. Anepimeral setae medium size, black; 2 katepisternal setae; 7-9 meral setae. Scutellum black; thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline, narrow; petiole of apical cell 0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown to black; hairs black. Fore tibia brown to black, with 0-1 *pv*, apically with 1 *pv* and 1 *d*. Fore tarus normal; brown to black. Fore claws brown, apex black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; hairs black. Mid tibia brown to black, with 1 *ad*, 1 *p* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur brown to black; hairs black. Hind tibia black, with 2-3 *ad* and one row of *pd*. Anterior spine-like setae of hind tibia present.

**ABDOMEN.** Abdominal tergites black; pruinosity thinly silvery; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots indistinct. **TERMINALIA.** Sternite VII (sheath) longer than sternite VI, broad apically, bent, apex directed ventrally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

The specific name refers to the African distribution of *Phasia africana*.

#### 3.6.2 *Phasia albipennis* (Brooks, 1945)

(Figures I-3, II-7.2)

*Paraphasia albipennis* Brooks, 1945: 657.

*Paraphasia nigra* Brooks, 1945: 658, syn. nov.

*Phasia nigrens*: authors, not Wulp (see Sabrosky and Arnaud 1965: 969).

*Phasia nigra*: Sabrosky and Arnaud 1965: 969 (catalog) - Arnaud 1978: 4 (host catalog).

*Phasia albipennis*: Sabrosky and Arnaud 1965: 969 (catalog).

#### DESCRIPTION

Body length: 6.5-8.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Vertex 0.12-0.13 times as wide as head width; eyes separated by a distance wider than or as wide as ocellar triangle. Fronto-orbital



plate black with grey pruinosity, 1-2 rows of hairs laterally. Frontal vitta parallel, reddish brown. Frontal vitta at base of antennae 1.1-1.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black, strongly grey pruinose. Parafacial black with grey pruinosity, bare, 1.8-2.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow or brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1-1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena brown to black with grey pruinosity; hairs white; height 0.1-0.2 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1-1.2 times as long as pedicel; arista thickened on basal 0.25-0.3. Length of oral opening 1.8 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum strongly pruinose; 4 black longitudinal vittae, with fine black hairs. 0+1 acrostichal seta; 0(1)+1 dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta absent; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron grey and yellow pruinose; hairs white and yellow. Anepimeral setae hair-like; yellow or black; 1 katepisternal seta; 9-11 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline, or pictured (rarely), narrow, or broad; petiole of apical cell 0.22-0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle, or almost at right angle. Halter yellow. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, with 1-2 *p*, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.2-1.3 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur brown to black; hairs black. Hind tibia black, slightly arched, with 5-6 *ad*, 3-5 *pd* and 3-4 *v*.

**ABDOMEN.** Abdominal tergites black; pruinosity yellowish silvery; longitudinal vitta absent; but with distinctly narrow black transverses. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.1; relative width I+II:III:IV:V = 0.3:1:0.9:0.7. Syntergite I+II pruinose. Pruinosity of tergite III silvery. Pruinosity of tergites IV, V yellowish silvery; hair spots indistinct. **TERMINALIA.** Syncercus broad, slightly notched posteriorly. Surstylus slender, straight, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium shorter than phallapodeme. Postgonite triangular. Pregonite shorter than postgonite, with sparse hairs dorsally. Phallus very broad and long, with fine white hairs dorsally; ventrolateral process with 4-5 small hooks; dorsolateral process hyaline, not sclerotized.

**FEMALE.** Body size slightly smaller than male. Wing hyaline. Eyes separated by a

distance as wide as the flagellomere; not touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) slightly longer than sternite VI, flattened, broad apically, bent, apex directed ventrally, smooth ventrally; median area membranous; and the bent part of sheath rectangular in posterior view. Ovipositor bent upward.

#### TYPE MATERIAL

*Paraphasia albipennis* Brooks, 1945. Holotype ♂, [CANADA], Saskatchewan, Saskatoon, 2.v.1940, A.R. Brooks (CNCI, No. 5288, examined).

*Paraphasia nigra* Brooks, 1945. Holotype ♂, [USA], California, Ukiah, 31.iii.1930, C.C. Wilson (USNM, examined); allotype ♀, [USA], California, Los Angeles Co., April (USNM, examined); paratype 1♂, [USA], California, Knights Lndg., 2.iv.1931 (CNCI, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. British-Columbia:** Hedley, 5,000ft, Nickel Plate 31.vii.1953, J.E.H. Martin (1♂, CNCI); Robson, 9.v.1949, 26.v.1950, H.R. Foxlee (1♂1♀, CNCI). **USA. California:** Foresthill Placer Co., 25.v.1975 (1♀, CASC); Mt. Diablo, 6-8-1933 (1♂, CASC); Mono Co., White Mt., Blanco's Corral, 10,000ft, 30.vi.1953, H. Nakakihara (1♂, CNCI); San Benito Co., Bitterwater, 8.iv.1951, P.D. Huld (1♀, CNCI); San Diego Co., Santa Ysabel, 10.iv.1950, P.D. Huld (1♂, CNCI); Tuolumne Co., 22.v.1972, W.H. Tyson (1♂, USNM). **Idaho:** Latah Co., Moscow, 30.iii.1937, 26.iv.1959 and 9.v.1966, B.A. Gittins, C.C. Ball, C.W. Sabrosky and B.A. Freeman (4♂4♀, CNCI, USNM). **Oregon:** Corvallis, 12.iv.1936, G. Ferguson (1♂, CNCI); Forest Grove, 26.v.1949, W.J. Hanson (3♂, USNM). **Utah:** Logan Dry Canyon, 26.iv.1941, Rotary Trap (1♂, CNCI); Logan, 11.iv.1949, G.L. Dean, (1♂, CNCI); [?], 30.iv.1931, G.F. Knowlton and C.F. Smith (1♀, AMNH). **Washington:** Pullman, 10.iv.1904, 16.iv. and 6.v.1922, A.L. Melander and A. Spuler (1♂3♀, USNM); Pullman, 15.v.1938 (1♀, CNCI).

#### HOST

*Eurygaster* spp. (Hemiptera, Pentatomidae): - USA (CA) (Vojdani 1961:576).

#### 3.6.3 *Phasia australiensis* Sun, sp. nov.

(Figures I-9, II-8.2)

#### TYPE MATERIAL

Holotype ♀, [AUSTRALIA], WA, Newmanns Rocks, 50km W Balladonia Motel, 19.i.1986, G. and A. Daniel (MV); paratypes, 1♀, [AUSTRALIA], [Tasmania], Risdon, 27.2.116, C. Cole (MV); 1♀, [AUSTRALIA], Queensland, Stanthorpe, 15.x.1925 (UQIC); 1♀, [AUSTRALIA], SA [South Australia], Great Vict., Desert, Vehicle net bet, 158 - 183km S Vokes Hill Corner, Dunes+Interdunes, 29.viii.1980, J. Forrest (SAMA).

**DESCRIPTION**

Body length: 6.5-7.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black, greyish yellow pruinose, 1-2 rows of hairs laterally. Frontal vitta triangular, brown. Frontal vitta at base of antennae 2.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black; greyish yellow pruinose. Parafacial black, greyish yellow pruinose, bare, as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, greyish yellow pruinose. Vibrissa not differentiated; inter-vibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown, greyish yellow pruinose; hairs white; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.66. Length of oral opening 2.7-2.8 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly grey pruinose, without black longitudinal vitta, with fine black hairs. 0+1(2) acrostichal seta; 1+1 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs and white black. Anepimeral setae hair-like, black; 2 katepisternal setae; 6-7 meral setae. Scutellum black, thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.23 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 4 *pd* and one row of *ad*. Anterior spine-like setae of hind tibia well developed.

**ABDOMEN.** Pruinosity grey present, but very thin; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:0.9; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots of tergites IV and V indistinct. Sternite VII (sheath) longer than sternite VI, apex flattened laterally, narrow apically, not bent, apex straight. Ovipositor bent upward.

**MALE:** Unknown.

**HOST**

Unknown.

**ETYMOLOGY**

This specific name refers to the Australian distribution of *Phasia australiensis*.

**3.6.4 *Phasia cana* Sun, sp. nov.**

(Figures I-2.5-8, II-7.4)

*Alophora nasalis* Bezzi: Emdeni 1945: 432 (in part).

**TYPE MATERIAL**

Holotype ♀, [SOUTH AFRICA], Transvaal, 8km NE Lake Trkhardt ?, 26.x.1978, host: adult of *Spilostethus pandurus* (Scopoly) (Hemiptera, Lygaeidae), B. Hevey (BMNH); paratypes, 1♀, [ZAIRE], Nyangwe, iv.v.1918, R. Mayné (MARC); 1♀, [SOUTH AFRICA], Royal Natal National Park, i.1962, B. and P. Stuckenberg (NMSA); 1♀, [TANZANIA], Old Shinyanga, 29.vi.1956, E. Burt (BMNH); 1♀, ZIMBABWE, Mazabuka, 18.xii.1931, host: *Dysdercus supersticiosus* F., A.M. Aivson (BMNH).

**DESCRIPTION**

Body length: 9 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes almost touching. Fronto-orbital plate black with grey pruinosity, 2 rows of hairs laterally. Frontal vitta black, divergent. Frontal vitta at base of antennae 1.8-1.9 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena brown and black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule normal; sublunular bulla indistinct. Antenna pedicel yellow or brown; first flagellomere black, 1.1 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 2.2 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly grey pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and brown or white. Anepimeral setae hair-like, black; 2 katapisternal setae; 6-8 meral setae. Scutellum black, thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.3 times as long as preceding section

of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsally with black hairs. Fore tibia black, without bristles, apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus black. Fore claws black; as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 2 *pd* and 2-3 *ad*. Anterior spine-like setae present.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area; pruinosity thinly yellowish silvery; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots indistinct. Sternite VII (sheath) longer than sternite VI, narrow apically, bent, apex directed dorsally, smooth ventrally. Ovipositor bent upward.

**MALE:** Unknown.

## HOSTS

*Spilostethus pandurus* (Hemiptera, Lygaeidae): - South Africa (new record).

*Dysdercus superstitiosus* (F.) (Hemiptera, Pyrrhocoridae): - Zimbabwe (new record).

## ETYMOLOGY

The Latin "*canus*" refers to the grey pruinose thorax.

### 3.6.5 *Phasia chilensis* (Macquart, 1851), comb. nov.

(Figures I-14, II-7.3)

*Hyalomya chilensis* Macquart, 1851: 189 - Guimarães 1971: 13 (catalog).

*Hyalomyia chilensis*: Aldrich 1934: 14 (description of female) - Cortés 1963: 249 (notes on type) - Berry 1951: 4 (notes on biology).

*Paraphoranthia peruviana* Townsend, 1936: 489, **syn. nov.** - Guimarães 1971: 13 (catalog).

*Paraphoranthia dimidiata* Townsend, 1937: 318, **syn. nov.** - Mendes 1938: 216 (hosts) - Guimarães 1971: 13 (catalog).

*Paraphoranthia pollinosa* Brooks, 1945: 660, **syn. nov.** - Sabrosky and Arnaud 1965: 969 (catalog) - Arnaud 1978: 4 (host catalog).

*Paraphoranthia auricaudata* Brooks, 1945: 661, **syn. nov.** - Sabrosky and Arnaud 1965: 969 (catalog).

*Phasia auricaudata*: O'Hara and Wood 1998: 765 (new combination).

*Phasia pollinosa*: O'Hara and Wood 1998: 765 (new combination).

## DESCRIPTION

Body length: 7-12 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, 1-2 rows of hairs laterally. Frontal vitta brown. Frontal vitta at base of antennae 1.1-1.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner ver-

tical setae absent. Face brown to black with grey pruinosity. Parafacial brown to black with grey pruinosity, bare, 1.2-1.3 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting; orange yellow or brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.0-1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3-1/2. Gena brown, grey or golden yellow pruinose; hairs white; height 0.2 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.33. Length of oral opening 1.7-1.8 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum strongly pruinose; 4 broad black longitudinal vittae, with fine black hairs. 0+0(1) Acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2-3 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron grey and yellow pruinose; hairs white and yellow. Anepimeral setae hair-like, black; 2 katepisternal setae; 8-10 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula brown. Basicosta yellow. Wing hyaline or pictured; petiole of apical cell 0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black, with white or yellow hairs, or hairs black. Fore tibia brown to black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.2-1.3 times as long as fifth tarsomere. Pulvilli brown to black. Mid femur black; hairs black. Mid tibia brown, with 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia brown, with one row of *ad* and *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity absent or present (yellow); longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 0.5:1.1:1.1:0.8. Syntergite I+II shiny, not pruinose. Pruinosity of tergite III absent, or present (yellow). Pruinosity of tergite IV yellow; hair spots indistinct. Pruinosity of tergite V yellow; hair spots indistinct. **TERMINALIA.** Syncercus long, deeply notched posteriorly, and hook-like in profile. Surstylus broad apically, arched dorsally, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium broad, as long as phallapodeme. Both postgonite and pregonite pointed, dorsal of pregonite and ventral of postgonite with sparse hairs. Postgonite slightly longer than pregonite. Phallus shorter than hypandrium, without fine hairs dorsally. Distiphallus almost hyaline, not sclerotized, hook-like apically.

**FEMALE.** Body size sometimes smaller than male. Wing hyaline. Eyes almost touching. Hind tibia with 2-3 rows of anterior spine-like setae. Abdominal tergites usually more shiny than male, and pruinosity mostly grey. Sternite VII (sheath) longer than sternite VI, long thorn-like, pointed apically, slightly bent, apex directed dorsally, smooth ventrally. Ovipositor bent upward.

**TYPE MATERIAL**

*Hyalomya chilensis* Macquart, 1851. Holotype ♂, [CHILE], "*H. chilensis* M., M. Gay, Chili" (NMNH, examined, poor condition).

*Paraphorantha peruviana* Townsend, 1936. Holotype ♂, PERU, Pacasmayo Prov., Jequeteque, vi.1936, Larnai Will (USNM, examined); allotype ♀, same as holotype (USNM, examined).

*Paraphorantha dimidiata* Townsend, 1937. Holotype ♂, [BRAZIL], "583" [no more data available, but according to original description, type-locality: Brazil, São Paulo, Tiete and Campinas.], with pupae (USNM, examined).

*Paraphorantha auricaudata* Brooks, 1945. Holotype ♂, [USA], Oregon, Milton, 22.vi.1938, K. Gray and J. Schuh (CNCI, examined); allotype ♀, [USA], Colorado, Cuchara, 8.7.1940, F. Snyder (CNCI, examined); paratypes: 1♂, [USA], California, Colton, 13.x., F.A. Eddy (CNCI, examined); 1♂, [USA], Idaho, Mt. Moscow, 24.vi., J.M. Aldrich (USNM, examined); 1♀, [USA], Washington, Yakima, 27.viii.1931, A.R. Rolfs (CNCI, examined).

*Paraphorantha pollinosa* Brooks, 1945. Paratypes, 1♂, [USA], California, Santa Clara Co., Baker (USNM, examined); 3♂3♀, [USA], Maryland, Chesapeake Beach, 21-ix, 18-x and 19.vii.1920, N.Bank and Bridwell (1♂1♀ CNCI, 2♂2♀, USNM, examined); 2♀, [USA], Maryland, Grove Hill and Beltsville, 30.x.1916 and 9.ix.1916, C.H.T. Townsend and W.L. McAtee (USNM, examined); 1♂2♀, [USA], Texas, College Station and Winter Haven, 21.v.1936 and 21.v.1919, S.E. Jones and H.J. Reinhard (CNCI, examined); 1♂1♀, [USA], Washington D.C., Bennings and Anacostia, 22.x.1914 and 24.ix.1914, R.C. Shannon (USNM, examined).

**OTHER MATERIAL EXAMINED**

**USA. Arizona:** Greenlee Co., Hwy. 78, 5 km W New Mexico border, 14.viii.1983, J.E. O'Hara (1♀, CNCI); Gila Co., Pinal Mtns., Pinal Peak, 15 mi SW Globe, 23-24.viii.1993, 7,500ft, J.E. O'Hara (1♂1♀, CNCI); Huachuca Mts., Sunnyside Canyon, 9.vii.1940, L.J. Lipovsky (1♂1♀, CNCI); Huachuca Mts., Sierra Vista (15 mi S), Ramsey Cyn., 5,200ft, 25.iii-2.v.1967, R.F. Sternitzky and D.M. Wood (3♂1♀, CNCI); Pinal Co., 7mi S Oracle, 28.iv.1967, D.M. Wood (1♀, CNCI); Patagonia Mts., 21.v.1955, G.D. Butler (1♀, CNCI); Santa Cruz Co., Canelo, 4,500ft, 17.iii.1967, R.F. Sternitzky (1♂, CNCI); Tucson, Lower Bear Cn., 13-15.iv.1967, D.M. Wood (1♂, CNCI); Yavapai Co., Congress, 23-26.iv.1967, D.M. Wood (1♀, CNCI). **California:** Mokel Hill., F.E. Blaisdell (1♀, CASC); Tuolumne Co., Jamestown, 26.iv.1951, J.W. MacSwam (1♂, CNCI); White Water, Snow Creek, 1,500ft, 29.iv.1955, W.R. Richards (1♀, CNCI). **District of Columbia:** Anacostia, 24.ix.1914, R.C. Shannon (1♀, USNM). **Idaho:** Mt. Moscow, 10.vii., 23.viii.1939, R.C. Shannon, T.A. Brindley (2♂, USNM). **Indiana:** Craters of the Moon Nat. Mon., 6.ix.1964 (1♂, CNCI). **Maryland:** Chesapeake Beach, 20.ix.1914, 10.ix., C.T. Greene, N. Bank (3♂1♀, USNM, CNCI); Ch. Chase Lk., 14.viii., C.H. Townsend (1♂,

USNM); Grove Hill, 2.xi.1916 and 31.x.1916, C.H.T. Townsend (1♂1♀, USNM). **Mississippi:** Agr. Col., 9.iv.1922, H.W. Allen (1♂, USNM); Lafayette Co., iv-v.1946, Spring 1943, vi.1934, v-vi.1955, F.M. Hull (2♂3♀, CNCI). **New Mexico:** Grant Co., Gila Nat. For., 21km N Silver City, 2,250m, 29-31.vii.1982, J.E. and W.M. O'Hara; Roosevelt Co., Portales, 7.xi.1987, N. Jorgensen (1♀, CNCI); Torrance Co., Manano Mtns., 8 mi W Tajique, 11-12.viii.1993, J.E. O'Hara (1♂, CNCI). **Oklahoma:** Willis, 6.vi.1986, D.J. Greene (1♂, USNM). **Texas:** Angelina Co., Angelina Nat. Forest, near Zavalla, 12.v.1993, X. Sun (1♂, DEBU); Big Bent N.P., 2,100-6,000ft, 1-9.v.1959, J.F. McAlpine (1♂2♀, CNCI); Blanco Co.(NW), Davis Ranch, 23.iv.1959, J.F. McAlpine (1♂1♀, CNCI), Brazos Co., College Station, 21.v.1919, 2.iv.1966 and 8.iv.1980, J.E. Eger, H.J. Reinhard and D.M. Wood (1♂2♀, USNM); Brewster Co., Big Bend National Park., Maple Cyn., 5,200ft, 9.vii.1982, G.A.P. Gibson (1♀, CNCI); Jeff Davis Co., Davis Mts., 20 mi N Fort Davis, 16.iv.1961, Rozen and Schrammel (1♀, AMNH); Fredericksburg, 18.iv.1959, J.F. McAlpine (1♂1♀, CNCI); Kerrville, 2.iv.1959, J.F. McAlpine (1♀, CNCI). **Utah:** Scipio, 10-3. 1956, (1♀, CNCI). **Washington:** Benton Co., Hanford Site, 1,200ft, 1.vi.1994, R.S. Zack (1♀, CNCI). **Doubtful States:** "Chepen, 10-9. 1964, K. Raven (1♂2♀, TAMU)". **ARGENTINA:** Santiago del Estero, 3.v.1940, ex: *Dysdercus ruficollis*, H.L. Parker (1♂, USNM). **BRAZIL:** Mato Grosso, Maracajú, v. 1937, M.E.S. Bras (1♀, USNM). **CHILE:** Panquehue, 12.iii.1941, ex: *Leptoglossus chilensis*, P.A. Berry (4♂, USNM); Coquimbba, Ovalle, 1.viii.1960, L. Pena (1♂, CNCI); Angol, 10.i.1927, D.S. Bullock (1♀, USNM). **MEXICO:** Queretaro, Queretaro, 25.ii.1953, R.C. Bechtel and R.I. Schlinger (♂, CNCI). **PERU:** Barranca, 11.vii.1941, ex: *Dysdercus sp.*, P.A. Berry (7♂5♀, USNM); Canete, E.J. Hambleton (1♀, USNM); Lima, 3.vi.1941, ex: *Dysdercus floollis*, P.A. Berry (5♂8♀, USNM); Lima, 1939, Weyrauch (1♂, USNM); Lima, 28.xi.1954, (1♂1♀, USNM); S.A. Rd., ex: *Dysdercus sp.*, P.A. Berry (1♀, USNM). **URUGUAY.** Montevideo, SAPar Labo, 19.vii, Benny, ex: *D. ruficollis* (3♂4♀, USNM); Montevideo, 10.v.1941, ex: *Dysdercus sp.*, P.A. Berry (1♂1♀, BMNH); Montevideo, So. Amer. Paras. Lab., 10.5.1947, ex: *Dyadercus* spp., P.A. Berry (2♀, BMNH). **VENEZUELA:** Mariara, Venezuela-Carabobo, 440m, 13.ii.1970, ex: *Largus cinctus* Sobremaiz, (1♀, USNM).

## HOSTS

*Chlorochroa ligata* Say (Hemiptera, Pentatomidae): - USA (TX) (Brooks 1945: 660).

*Thyanta pallido-virens* (Stal.) (Hemiptera, Pentatomidae): - USA (TX, College Station).

*Dysdercus sp.* (Hemiptera, Pyrrhocoridae): - Peru (Barranca), Uruguay (Montevideo), Brazil (Campinas) (new record).

*Dysdercus ruficollis* (Linnaeus) (Hemiptera, Pyrrhocoridae): - Uruguay (Montevideo); Argentinian (Santiago del Estero); Peru (Lima).

*Leptoglossus chilensis* Berg. (Hemiptera, Coreidae): - Chile (Panguehue).

*Largus cinctus* Herrich-Schaeffer, 1842 (Hemiptera, Largidae): - Brazil (Mato Grosso).



**NOTES**

*Phasia chilensis* Macquart is widespread in the New World, with a distribution extending from the northern United States south to Argentina. Aldrich (1934: 13-14) described a female specimen from Chile but his description is misleading, and inaccurately records a single row of frontal bristles.

**3.6.6 *Phasia clavigralla* Sun, sp. nov.**

(Figures I-15.1-4, II-7.4)

**TYPE MATERIAL**

Holotype ♀, TANZANIA, Kilosa district, Ilouga ARI, 6.vi.1979, host: *Clavigralla elongata* Signoret (Coeidae), P.C. Matteson (BMNH).

**DESCRIPTION**

Body length: 6.5 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate black with grey pruinosity, one row of hairs laterally. Frontal vitta brown, divergent. Frontal vitta at base of antennae 1.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Intervibrissal distance 1.2 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena brown and black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule normal; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.4 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly grey pruinose, even, without black longitudinal vitta, with fine black hairs. 0+0 Acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and brown. Anepimeral setae medium size, black; 2 katapisternal setae; 7-8 meral setae. Scutellum black; thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarus black. Fore claws black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs

black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with one row of *ad* and *pd*. Anterior spine-like setae of hind tibia present.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.4:1:1:1; relative width I+II:III:IV:V = 0.45:1:1:0.7. Syntergite I+II shiny, not pruinose. Tergite III shiny. Pruinosity of tergite IV absent; hair spots indistinct. Pruinosity of tergite V silvery. Sternite VII (sheath) longer than sternite VI, stick-like, with a knob apically, not bent, apex straight, smooth ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### HOST

*Clavigralla elongata* Signoret (Hemiptera, Coreidae): - Tanzania (new record).

#### ETYMOLOGY

This specific name refers to the generic name of the host, *Clavigralla*.

#### NOTES

This specimen is labelled as *Allophora nasalis* (Bezzi) by K.M. Harris.

#### 3.6.7 *Phasia fenestrata* (Bigot, 1889)

(Figures I-19, II-7.2)

*Alophora fenestrata* Bigot, 1889: 137 - Coquillett, 1897: 46.

*Phorantha bidwelli* Hine, 1902: 229.

*Alophora magnapennis* Johnson, 1904: 19.

*Paraphasia fenestrata*: Townsend, 1915: 20, 1938: 63 - Brooks 1945: 656 (redescription).

*Phasia phasiatrata* Smith, 1915: 98 - Townsend 1916: 128.

*Phasia fenestrata*: Sabrosky and Arnaud 1965: 969 (catalog).

#### DESCRIPTION

Body length: 7-11 mm.

**MALE: HEAD.** Head compressed anteriorly. Vertex 0.2 times as wide as head width. Fronto-orbital plate black with grey pruinosity, 2-3 row of hairs laterally. Frontal vitta black. Frontal vitta at base of antennae 1.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face yellow, or brown, grey pruinose. Parafacial brown, grey pruinose, bare, 1.8-2.0 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, grey pruinose. Vibrissa not differentiated; intervibrissal distance 1.4-1.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower than 1/5. Gena brown to black with grey pruinosity; hairs white; height 0.2 times eye height. Lunule

black and shining; sublunular bulla indistinct. Antenna black, or pedicel yellow or brown; first flagellomere black, 1.1 times as long as pedicel; arista thickened on basal 1/5-1/4. Length of oral opening 0.4-0.5 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow, or brown.

**THORAX.** Mesoscutum strongly yellow or yellowish grey pruinose, with 4 black longitudinal vittae, and fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 2-3 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron grey and yellow pruinose; hairs white and yellow. Anepimeral setae hair-like, black; 1 katepisternal seta; 5-8 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline or pictured, narrow or broad; petiole of apical cell 0.25-0.33 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle, or almost at right angle. Halter yellow or brown. **LEGS.** Fore femur brown, upper part black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia brown to black, without bristles, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.4-1.5 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown, upper part black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Mid tibia yellow or brown, with 1 *ad* and 1 *v*, apically with 1 *av*, 1 *pv*, 0-1 *p*, 1 *v* and 1 *d*. Hind femur brown, upper part black; whitish yellow or black hairs. Hind tibia yellow or brown, arched, with several strongly setae.

**ABDOMEN.** Abdominal tergites black, but with yellow spot or area; pruinosity absent, or present (silvery); longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.5:1:1:1.5; relative width I+II:III:IV:V = 1:2.3:2.3:2. Syntergite I+II shiny, or pruinose. Pruinosity of tergites III, IV, V absent, or present (silvery or yellow); hair spots indistinct. **TERMINALIA.** Syncercus broad, posterior notch shallow and circular. Surstylus slender, longer than cercus. Phallapodeme longer than hypandrium. Postgonite triangular, pointed apically. Pregonite small, reduced, with sparse hairs dorsally. Phallus long and broad, with dense fine hairs dorsally. Distiphallus partly sclerotized, with a pair of teeth apically.

**FEMALE.** Body size slightly smaller than male. Wing hyaline. Vertex 0.1-0.12 times as wide as head width; Eyes not touching. Anterior spine-like setae of hind tibia absent. Sternite V short and broad. Sternite VII (sheath) slightly shorter than sternite VI, broad flattened; broad apically; bent, apex directed ventrally; smooth ventrally; median area membranous. Ovipositor bent upward.

#### TYPE MATERIAL

*Alophora fenestrata* Bigot, 1889. Holotype ♂, [USA], [Nevada], "Ex: Bigot Coll., B.M. 1960-539" [no more data] (BMNH, examined).

*Phasia phasiatrata* Smith, 1915. Holotype ♀, [USA], Massachusetts, Cohasset, 30.vi.1914, R.T. Webber (USNM, No.19238, examined).

#### OTHER MATERIAL EXAMINED

**CANADA. Alberta:** Calgary, 1.v.1926, O. Bryant (1♂, DEBU). **Northwest Territories:** Wrigley, 3.vi.1969, G.E. Shewell (1♀, CNCI). **Ontario:** Arkell, 13.v.1986, E.A. Lippert (1♂, LACM); Beaulieu, St-Hilaire, 24.v.1906 (2♂, CNCI); Bell's Corners, 8-9.v.1951, J.F. McAlpine (2♂, CNCI); Chatterton, 24.v.1956, J.C. Martin (1♀, CNCI); Constance, 15.v.1934, G.S. Walley (1♂, CNCI); Dornoch (3km NW), 8.v.1990, J.E. O'Hara (1♀, CNCI); Grey Co., [?], Griffith (7mi E), 9-27.vi.1983, B.E. Cooper (3♂, CNCI); Guelph, near Kortright Pk., 18.v.1993, W. Bennett (1♀, DEBU); Guelph, 18-21.iv.1973, 10.v.1973, 12.v.1987 and 28.iv-v.1987, E.A. Lippert, R.P. Macfarlane and V. Goline (4♂2♀, DEBU, AMNH); Lanark Co., N. Burgess Twp, 26.iv.1970, D.M. Wood (1♂, CNCI); Markdale, 2.vi.1993, S.A. Marshall (1♂1♀, DEBU); Metcalfe, 7-31.v-15.vi.1983, 12.v.1986, 29.v.1993, B.E. Cooper (11♂19♀, CNCI); Mississippi Lk., 15.v.1991, L. Masner (2♂, CNCI); Niagara, 21.vi.1939, (1♂, CNCI); Ottawa, 24.vi.1919 et al, A. Brooks (2♂, AMNH, CNCI); Ottawa, nr. Uplands Airport, 21-28.v.1992, J.M. Cumming (1♂, CNCI); Rockwood, 27.iv.1963, D.B. Stoltz (1♂, DEBU); Toronto, 23.vi.1983 (1♀, DEBU). **Quebec:** Aylmer, 1.vi.1924, C.H. Curran (1♀, AMNH); Gatineau Co., Masham Twp., 28.v.1978, D.M. Wood (1♂, CNCI); Hull, 24.v.1923, C.H. Curran (1♂, CNCI); Laniel, 24.v.1934, C.E. Atwood (1♂, CNCI); Montreal Isl., 29.v.1904 (1♂, USNM); Rigaud, 15.v.1991, J.E. O'Hara (1♀, CNCI); Summit Mt. Rigaud, 30.iv.1986 and 15.v.1991, D.M. Wood and B.E. Cooper (1♂1♀, CNCI). **USA. District Of Columbia:** Rock Creek, 16-25.iv, F. [flowers of] *Antennaria*, C.H.T. Townsend (3♂5♀, USNM, CNCI); 19.iv.1918, C.H.T. Townsend (1♀, BMNH). **Indiana:** Tippecanoe., 12.iv.1956 (1♂, USNM). **Kansas:** Douglas Co., 11.viii.1950, R.H. Pine (1♂, USNM); Lawrence, 16.iv.1922, C.H. Curran (1♂, CNCI); Labette Co., Oswego, 10.iv.1965, G.F. Hevel, (1♂, USNM); Pottawatomie Co., 29.iv.1955, McReynolds (2♀, KSUC). **Michigan:** Agr. Coll., 21.iv.1922, L.G. Gentner (1♀, CNCI); Eaton Co., 13.vi.1937 and 5.vi.1927, R.R. Dreisbech (2♀, CNCI); Washtenaw Co., 10.vi.1954, S. Keller (1♂, USNM). **New York:** Cayuga, 8.v.1935, H.K. Townes (1♂1♀, CNCI); Caroline, 6.v.1919, E.G. Anderson (5♂, USNM, CUC, CNCI, BMNH); Caroline, (1♂, BMNH); Ithaca, v. and 7.v.1932 and 23.iv.1934, R.C. Shannon and L.S. West (3♂3♀, CNUC, USNM, CNCI); Owego, 24.iv. 1935 and 2.iv.1922, L.S. West etc. (1♂1♀, CNUC); **North Carolina:** Raleigh, 21.iv.1906, C.S. Brimley (1♂, USNM); **Pennsylvania:** Wilawana, 10.vi.1935, R.H. Crandall, (2♂, AMNH). **Virginia:** Fairfax Co., Dead Run, 26.iii.1925, R.C. and E.M. Shannon (1♂, USNM); Falls Church, 26.iv.1914 (1♂, USNM); Great Falls, 20.iv.1916, 19.iv.1915 and 23.v.1918, W.L. McAtee and C.T. Greene (1♂3♀, USNM); Mount Vernon, 16.iv.1916, A. Wetmore (2♂, USNM); U. of Richmond, 1.v.1936, C.C. Walton (1♂, USNM); Vienna, 6-7.iv.1942, J.C. Bridwell (1♂1♀, USNM).

**3.6.8 *Phasia hippobosca* (Paramonov, 1958), comb. nov.**

(Figures I-24, II-8.2)

*Hyalomyia hippobosca* Paramonov, 1958: 594.*Alophora hippobosca*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).**DESCRIPTION**

Body length: 6-9 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity; with 2-3 rows of hairs laterally (close to frontal setae). Frontal vitta broad, brown. Frontal vitta at base of antennae almost 3 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile; brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.4-1.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena black with grey pruinosity; hairs white; height 0.2 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.4 times as long as pedicel; arista thickened on basal 0.4. Length of oral opening 2.6-2.8 times its width. Occiput flattened, white pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum shining, without pruinosity; extremely flattened, with fine black hairs. 0+1 acrostichal seta; 0+1(2) dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta absent; 0 postsutural intra-alar seta; 2 notopleural setae; 1-2 supra-alar setae; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae hair-like, black; 1 katepisternal seta; 6-9 meral setae. Scutellum black; extremely flattened dorsoventrally; shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter brown to black. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured on basal 1/2, anal area white; broad; petiole of apical cell 0.34 times as long as preceding section of  $R_{4+5}$ ;  $M$  meeting  $R_{4+5}$  almost at right angle. Halter yellow, or brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, with 1  $p$ , apically with 1  $pv$  and 0-1  $d$ . Fore tarus black. Fore claws brown, apex black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; hairs black. Mid tibia black, with 1  $ad$ , 1  $av$  and 1  $v$ , apically with 1  $av$ , 1  $pv$ , 1  $v$  and 1  $d$ . Hind femur brown to black (strongly arched, swollen); hairs black. Hind tibia black, as long as hind femur, with 4-6  $pd$ , 4-6  $ad$  and 3-4  $v$ .

**ABDOMEN.** Abdominal tergites black; pruinosity absent; longitudinal vitta absent; spherical. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:0.9:0.8; relative width I+II:III:IV:V = 0.3:1:1:0.8. Hair spots of tergites IV, V indistinct. **TERMINALIA.** Syncercus slender, V-notched posteriorly. Surstylus narrow, slender, straight, as long as

cercus. Ejaculatory apodeme small. Hypandrium broad, shorter than phallopodeme, but almost as long as phallus. Pregonite broad, haired dorsally. Postgonite as long as pregonite; pointed, haired ventrally. Phallus short, sparsely haired dorsally on basal 1/2. Distiphallus well sclerotized, with a pair of reversal hooks.

**FEMALE.** Wing hyaline. Eyes separated by a distance as wide as single ocellus. Body less flattened than male. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) slightly longer than sternite VI, broad apically, bent, apex directed ventrally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia hippobosca* Paramonov, 1958. Holotype ♂, AUSTRALIA, ACT, Canberra, 26.ix.1948, Paramonov (ANIC, examined); paratypes, 1 ♂, AUSTRALIA, ACT, Molouglo R., 20.iii.1930, L.F. Graham (ANIC, examined); 1 ♂, AUSTRALIA, Victoria, Mt. Hotham, 5,900ft, 1.2.1957 (MVNH, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRALIA: Australian Capital Territory:** Blundell's [?], 11.x.1950, Paramonov (1 ♀, ANIC). **New South Wales:** Blue Mtns., Mt. Tomah, 6.12.1981, 4.2.1979 and 1.10.1978, N.W. Rodd (3 ♂, AMSA); Gibraltar Range National Park, Waratah track, 10-12.xi.1984, D.K. Yeates (2 ♂, MVNH); Woodford, 11.xii.1976, G. Williams (1 ♂, AMSA); 12km SW Ebor, 13.xii.1984, D.K. Yeates (1 ♂, MVNH). **Queensland:** Dayboro, 10.i.1983, B. Cantrell (1 ♂, QDPC). **Victoria:** Mt. Wilson, (3km S), 10.x.1978, N.W. Rodd (1 ♂, AMSA); [no more data], (1 ♂, BMNH); Daudeswy Damys [?], 3.2.1899 (1 ♂, MVNH); Grampians, x.1928, F.E. Wilson (1 ♂, MVNH).

#### HOST

Unknown.

#### 3.6.9 *Phasia lauta* Sun, sp. nov.

(Figures I-28, II-8.1)

#### TYPE MATERIAL

Holotype ♂, INDONESIA, North Borneo, Upper Kinabatangan R., ii.1950, J.K. Cox. [ex: Com. Inst. Ent. Coll., No.11687] (BMNH).

#### DESCRIPTION

Body length: 7.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black; greyish yellow pruinose, one row of hairs laterally. Frontal vitta triangle, black. Frontal vitta at base of antennae 2.1 times as wide as

fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae present. Face black, yellow pruinose. Parafacial black, greyish yellow pruinose, bare, 1.1 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting; orange yellow, yellow pruinose. Vibrissa well differentiated; inter-vibrissal distance as long as distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity and yellow pruinose; hairs white; height 0.11 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.18. Length of oral opening 1.8 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly pruinose; presutural area with 4 broad black longitudinal vittae, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral setae; 1 postpronotal seta; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and white or yellow. Anepimeral setae hair-like, black; 1 katapisternal seta; 9-11 meral setae. Scutellum brown, grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing hyaline, narrow; petiole of apical cell 0.26 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur swollen, black; hairs black. Fore tibia black, without bristles, apically with 0-1 *v*, 1 *pv*, 1 *d*. Fore tarus flatted; black. Fore claws black; 1.3 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, slightly arched, with 6-7 *pd* and 4-5 *ad*.

**ABDOMEN.** Abdominal tergites brownish black; pruinosity absent; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:0.9:1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus broad triangular, with a shallow notch posteriorly. Surstylus broadened apically, arched dorsally, longer than cercus. Ejaculatory apodeme small, apex bent. Hypandrium shorter than phallopodeme. Pregonite not developed. Postgonite long, pointed, bent ventrally. Phallus very long and broad, about 2.3 times as long as hypandrium, haired dorsally on basal 1/2. Distiphallus membranous.

**FEMALE.** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name is from Latin "*lautus*" meaning elegant or neat, and refers to the shiny, bare abdominal dorsum.

**3.6.10 *Phasia malayana* Sun, sp. nov.**

(Figures I-27.5-9, II-8.1)

**TYPE MATERIAL**

Holotype ♂, MALAYSIA, Serdang, 27.i.1931, N.C.E. Miller (BMNH).

**DESCRIPTION**

Body length: 11.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, 2-3 rows of hairs laterally. Frontal vitta brown, triangular. Frontal vitta at base of antennae 2.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial brown, grey pruinose, bare, 1.8 times as wide as first flagellomere. Lower margin of face perpendicular, not projecting, brown, grey pruinose. Vibrissa not differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown, grey pruinose; hairs white; height 0.15 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.6 times its width. Occiput flattened, white pruinose; hairs white, or black. Palpus brown.

**THORAX.** Mesoscutum thinly pruinose, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, white and yellow. Anepimeral setae hair-like, black; 2 katepisternal setae; 7-8 meral setae. Scutellum base black with yellow tip, grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured, brown area along with vein; petiole of apical cell 0.26 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia black, with 2 *d*, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws black; 1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsal surfaces with black hairs. Mid tibia black, with 1 *ad*, apically with 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, slightly arched, with one row of *ad* and *pd*.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area; pruinosity yellow; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots of tergites IV, V indistinct.

**TERMINALIA.** Syncercus slender, with a small semicircular notch posteriorly; apex bent



downward. Surstylus arched dorsally, longer than cercus. Ejaculatory apodeme small, slender. Pregonite long, pointed. Postgonite pointed, as long as pregonite. Hypandrium broad, slightly shorter than phallapodeme. Phallus short, without fine hairs. Distiphallus node-like, membranous, pointed.

**FEMALE.** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name refers to the country from which the type was collected, Malaysia.

#### 3.6.11 *Phasia multisetosa* (Villeneuve, 1923), comb. nov.

(Figures I-37, II-8.3)

*Allophora multisetosa* Villeneuve, 1923: 81.

*Allophora multisetosa*: - Emden 1945: 432 (revision).

*Allophora (Allophorella) multisetosa*: - Crosskey 1980: 824 (catalog).

#### DESCRIPTION

Body length: 7-8 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance 0.5 times as wide as ocellar triangle. Fronto-orbital plate black, yellowish grey pruinose, 2-3 rows of hairs laterally. Frontal vitta brown, divergent. Frontal vitta at base of antennae 1.8 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face brown, grey pruinose. Parafacial brown, grey pruinose, bare, 1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow; yellowish grey pruinose. Vibrissa well differentiated; intervibrissal distance as long as distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena brown, grey pruinose; hairs white; height 0.11 times eye height. Lunule normal; sublunular bulla indistinct. Antenna pedicel yellow or brown; first flagellomere black, 1.3 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 2.1-2.2 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum very thinly grey pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta absent; 0 postsutural intra-alar seta; 2-3 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and brown. Anepimeral setae medium size, black; 2-7 katepisternal setae; 6-8 meral setae. Scutellum brown; thinly grey pruinose, with two pairs of marginal setae; apical setae present and distinct;

discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta yellow. Wing pictured, narrow or broad; petiole of apical cell 0.24 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia brown, without bristles, apically with 1 *v*, 1 *pv* and 1 *d*. Fore tarus brown. Fore claws brown, apex black, 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown, ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Mid tibia brown, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *pv*, 1 *v* and 1 *d*. Hind femur brown, ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Hind tibia brown, with 4 *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites yellow, but tergites IV, V sometime black; pruinosity absent; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1; relative width I+II:III:IV:V = 0.4:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus slender, not notched posteriorly, apex bent ventrally. Surstylus longer than cercus, flattened dorsoventrally. Ejaculatory small, knob-like. Hypandrium broad, as long as phallapodeme. Pregonite reduced, even, haired ventrally. Postgonite well-developed, haired ventrally, apex almost rounded. Phallus broad, long, haired dorsally. Distiphallus membranous.

**FEMALE:** Eyes touching. Wing pictured. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI, pointed apically, bent, apex directed dorsally, smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

Holotype ♀, NIGERIA, Ibadan, 12.9.1922 (BMNH, examined).

#### OTHER MATERIAL EXAMINED

**ZIMBABWE:** Umtali District, 23.ix.1931, P.A. Sheppard (1♂, AMNH). **TANZANIA:** Tanganyika, Ilonga, ix-xi.1954, host: *Dysdercus* sp. P.T. Walker (1♂1♀, BMNH).

#### HOSTS

*Dysdercus supersticiosus* F. (Hemiptera, Pyrrhocoridae): - Nigeria (Emden 1945: 432).  
*Dysdercus* sp. (Hemiptera, Pyrrhocoridae): - Tanzania (new record).

#### NOTES

According to Emden (1945: 432), the type specimen was reared from *Dysdercus supersticiosus* F. by A.W.J. Pomeroy, but there is no such host label with the type.

**3.6.12 *Phasia nasalis* (Bezzi, 1908), comb. nov.**

(Figures I-38, II-8.3)

*Hyalomyia nasalis* Bezzi, 1908: 384.*Allophora nigeriensis* Villeneuve, 1923: 80.*Hyalomyia cuthbertsoni* Curran, 1936: 8.*Allophora nasalis*: - Emden 1945: 432 (revision).*Allophora (Alophorella) nasalis*: - Crosskey 1980: 824 (catalog).**DESCRIPTION**

Body length: 5-10 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, 2-3 rows of hairs laterally. Frontal vitta brown, divergent. At base of antenna, frontal vitta 2.1 times as wide as fronto-orbital plate anteriorly. Ocellar setae absent, or present but fine; outer vertical setae absent; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial black with grey pruinosity, bare, and 1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, greyish yellow pruinose. Vibrissa well differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown and black with grey pruinosity; hairs white; height 0.1 times eye height. Lunule normal; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.2. Length of oral opening 2.3 times its width. Occiput slightly convex, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum thinly grey pruinose, even, without black longitudinal vitta, with fine black hairs. 0+1 Acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; pre-sutural supra-alar seta absent; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, brown and white. Anepimeral setae medium size, black; 2 katapisternal setae; 7-10 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing pictured, narrow; petiole of apical cell 0.20-0.23 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown to black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia brown to black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarsus black. Fore claws brown, apex black, 1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Mid tibia brown to black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur brown to black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Hind tibia brown to black, with one row of *ad* and *pd*.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area; pruinosity present; longitudinal vitta absent; tergites brown, with a median black longitudinal vitta. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots of tergites IV and V indistinct. **TERMINALIA.** Syncercus short, with a shallow notch posteriorly; apex bent ventrally. Surstylus longer than cercus, apex broad. Ejaculatory apodeme long, pointed. Hypandrium shorter than phallapodeme. Pregonite small, pointed; Postgonite longer than pregonite, haired ventrally. Phallus broad, long; haired dorsally. Distiphallus swollen, membranous.

**FEMALE:** Eyes touching. Anterior spine-like setae of hind tibia present. Tergites black. Sternite VII (sheath) longer than sternite VI; median part laterally flattened, apex flattened dorsoventrally, broad apically in ventral view; apex not bent, straight, almost smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia nasalis* Bezzi, 1908. Holotype, sex?, Belg. Congo, Boma (not located, not examined).

*Allophora nigeriensis* Villeneuve, 1923. Syntype, 1♂, NIGERIA, Ibadan, 26.ix.1922 (BMNH, with pupae, examined).

#### OTHER MATERIAL EXAMINED

**NIGERIA.** Ibadan, 23.v.-11.xii.1922 and 3.4.1923, host: *Dysdercus supersticiosus*, A.W.J. Pomeroy and G.E. Bryant (18♂7♀, BMNH, AMNH); Yankara, Kaduna State, 13.x.1978, host: *Acanthomyia tomentosicollis*, P.C. Matteson (1♀, BMNH). **KENYA.** Nairobi, host: *Agonoscelis puberula*, (2♀, BMNH); N.A.L. 4/8/67, host: *Dysdercus supersticiosus*, G.R. Rens (3♂1♀, BMNH). **SOUTH AFRICA.** Orange Free State, Bothaville, 10.1.99, Dr. Brauns (1♂, CNCI). Cape Province, Doorn R. Falls, xi.1931, A. Mackie (1♂, BMNH); Transvaal, Barberton, 6.iv.1932 and 25.iii.1931, host: *Dysdercus fasciatus* Sign., (6♂6♀, BMNH, CNCI); Transvaal, Magaliesberg Mts., Tonkwan, 11/12/76 (2♂, BMNH); Willowmore, Capland, 1.11.1912, Dr. Brauns (2♂, NMSA, USNM). **TANAZANIA.** Kilosa District, 6-vi.1979, P.C. Matleson (2♂1♀, BMNH). **ZAIRE.** Bambesa, v.1934, host: *Dysdercus supersticiosus*, H.J. Bredo (1♂1♀, MRAC); Grandajika, v.1955, host: *Dysdercus supersticiosus* (2♂, MRAC). **ZIMBABWE.** Gatooma, host: *Dysdercus faciatus* (1♂, BMNH).

#### HOSTS

*Acanthomyia tomentosicollis* Stal (Hemiptera) - Nigeria (new record).

*Agonoscelis versicolor* (Fab.) (Hemiptera) - Kenya (Emden 1945: 432).

*Agonoscelis puberula* (Hemiptera) - Kenya (new record).

*Dysdercus fasciatus* Sign., (Hemiptera, Pyrrhocoridae) - Zimbabwe, South Africa (Emden 1945: 432).

*Dysdercus intermedius* Dist., (Hemiptera, Pyrrhocoridae) - (Emden 1945: 432).  
*Dysdercus supersticiosus* F., (Hemiptera, Pyrrhocoridae) - Kenya, Nigeria (Emden 1945: 432).

**NOTE**

This species is also recorded from Zambia (Crosskey 1980: 824).

**3.6.13 *Phasia noskiewiczi* (Draber-Mońko, 1965)**

(see Draber-Mońko 1965: 118-119, figs. 132-137)

*Alophora (Phorantha) noskiewiczi* Draber-Mońko, 1965: 118.

*Phasia (Phasia) noskiewiczi*: Herting 1984: 169 (catalog); - Herting and Dely-Draskovits 1993: 410 (catalog).

**NOTES:** *Phasia noskiewiczi* (Draber-Mońko) was described by Draber-Mońko based on a single female specimen from Uzbekiston [holotype ♀, Uzbekiston, Syr-Daria Oblast, Perovsk, 13.v.1928, V. Popov]. The holotype is in the Institute of Zoology, Russian Academy of Sciences, St. Petersburg (not examined). *Phasia noskiewiczi* is similar to *Phasia subcoleoprata*, but it can be separated from the latter by the small body size and sternite VII pointed in profile. The host and biology are unknown.

**3.6.14 *Phasia rufiventris* (Macquart, 1851), comb. nov.**

(Figures I-53, II-8.2)

*Hyalomyia rufiventris* Macquart, 1851: 188(215); - Crosskey 1971: 272 (type revision).

*Austrophasia rufiventris*: Townsend 1916: 45; - 1938: 41.

*Alophora aureiventris* Curran, 1927: 165, **syn. nov.**

*Hyalomyia costalis* Malloch, 1929: 284, **syn. nov.**

*Hyalomyia nigrisquama* Malloch, 1929: 110, **syn. nov.**

*Hyalomyia chrysis* Malloch, 1930: 95, **syn. nov.**

*Hyalomyia discalis* Malloch, 1930: 95, **syn. nov.**

*Alophora (Alophorella) aureiventris*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog) - Cantrell 1988: 89 (description of male and female terminalia).

*Alophora (Alophorella) rufiventris*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora (Alophorella) costalis*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora (Alophorella) discalis*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora (Alophorella) chrysis*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora nigrisquama*: Crosskey 1973: 110 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Alophora aureiventris*: Cantrell 1986: 259 (host).

**DESCRIPTION**

Body length: 4.5-9 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate brown to black with grey pruinosity, 1-2 rows of hairs laterally (closed to frontal setae). Frontal vitta brown, triangular. Frontal vitta at base of antennae 2.1-2.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent or present; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial brown to black with grey pruinosity, bare, 1.1 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown, grey pruinose; hairs white; height 0.15-0.18 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.1-1.2 times as long as pedicel; arista thickened on basal 0.66. Length of oral opening 2.1-2.4 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum strongly pruinose, with 4 black longitudinal vittae, the central two vittae ended at middle of postsutural area, or merged into big black area, with fine black hairs. 0+1(2) acrostichal setae; 0(1)+1 dorsocentral setae; 2-3 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black and white and yellow. Anepimeral setae medium size, black; 2 katepisternal setae; 6-7 yellow or black setae. Scutellum black with grey pruinosity and yellow pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula brown to black. Basicosta yellow. Wing hyaline or pictured in various patterns, narrow or broad; petiole of apical cell 0.20-0.22 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia black, without bristles, apically with 1 *p* and 1 *d*. Fore tarsus black. Fore claws brown, apex black; 1.1-1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black, or ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia black, with 6-8 *ad* and 4-5 *pd*.

**ABDOMEN.** Abdominal tergites black, or with yellow spot or area; pruinosity present, but thin; longitudinal vitta absent, or distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.2; relative width I+II:III:IV:V = 0.4;1:1:0.9. Syntergite I+II shiny, not pruinose. Tergite III shiny. Pruinosity of tergite IV silvery, or yellow; hair spots indistinct. Pruinosity of tergite V yellow. **TERMINALIA.** Syncercus without notch posteriorly. Surstylus longer than cercus, strongly arched dorsally. Ejaculatory apo-

deme small, knob-like. Hypandrium broad, longer than phallapodeme. Epiphallus distinct. Pregonite well developed, with fine hairs dorsally. Postgonite as long as pregonite, apex spherical. Phallus broad, almost as long as hypandrium, without fine hairs dorsally. Distiphallus branched, membranous.

**FEMALE:** Usually smaller than male. Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia absent. Abdominal tergites black or with yellow transverse bands. Sternite VII (sheath) longer than sternite VI, slender, pointed apically, slightly bent, apex directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Hyalomyia rufiventris* Macquart, 1851. Holotype ♂, [AUSTRALIA], Tasmania, No. 2308, "3 47" (MNHN, Paris, examined).

*Alophora aureiventris* Curran, 1927. Holotype ♂, [AUSTRALIA], Queensland, Biloela, Apr. 1927, ex: *Dysdercus sidae* Montr., with pupa, E. Ballard (BMNH, examined); allotype ♀, AUSTRALIA, Queensland, Gatton, Oct. 1926, ex: *Dysdercus sidae* Montr., with pupa, E. Ballard (BMNH, examined); paratypes, 2♂1♀, AUSTRALIA, Queensland, Brisbane, 10.iv.1926, ex: *Dysdercus sidae*, E. Ballard (QDPC, AMNH, examined).

*Hyalomyia costalis* Malloch, 1929. Holotype ♂, AUSTRALIA, Woodford, 15.xi.1925, Mackerras (ANIC, examined).

*Hyalomyia nigrisquama* Malloch, 1929. Holotype ♂, [AUSTRALIA], N. Sydney, French Forest, 14.xii.1923, T.G. Campbell (AM, examined).

*Hyalomyia chrysis* Malloch, 1930. Holotype ♂, [AUSTRALIA], Western Australia, Narrogin, 30.viii.1926, E.W. Ferguson (ANIC, examined).

*Hyalomyia discalis* Malloch, 1930. Holotype ♂, [AUSTRALIA], Western Australia, Geraldton, 5.ix.1926, E.W. Ferguson (ANIC, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRALIA: Australian Capital Territory:** Canberra, (1♂, ANIC); Canberra, 17.ii.1948, S.J. Paramonov (1♂, ANIC). **New South Wales:** Bilpin nr. Kurrajong, 23.v.1979, N.W. Rodd (1♂, AMSA); Blue Mountains, Bilpin, 2.ix.1977, 26.ix.1978, N.W. Rodd (6♂, AMSA); Blue Mountains, Mt. Tomah, 26.x.1978, 12.iii.1981, N.W. Rodd (2♂, AMSA); Blue Mountains, Mt. York, 20.i.1982, N.W. Rodd (1♂, AMSA); Kanangra, Boyd National Park, Budthingaroo Cr., 25.xii.1977, G. Daniels (1♂, AMSA); Cranmore Park [?], 12. xi.1933, Fuller (1♂, ANIC); Deepwater (NE), Cox's Rd. Forest lands s.f. 17.xii.1985, G. Williams (1♂, AMSA); Galston Gorge, 27.viii.1959, M. Nikitin, B.M. 1959-616 (1♂, BMNH); Inverell [?], 29.viii.1959, J. Crothers (1♂, NSW); Kinchega National Park, 11-13.ix.1980, N.W. Rodd (1♂, AMSA); 7.5 mi E Braidwood, Mongarlowe R., 1.xii.1972, G.B. Fairchild (2♂, USNM); Mt. Donna Buang [?]. v. and 3-2-1951 (1♂, MVNH); Sydney, (5♀, NSW); Waratah track, Gibraltar Range National Park, 10-12.xi.1984, D.K. Yeates (1♂, UQIC); Yass, 16-17.x.1935, 14.xi.1939, K. English (1♂2♀, AMSA, NSW). **Queen-**

**sland:** Biloela, 3.v.1927, ex: *Dysdercus sidae*, (1♂, BMNH); Gladstone (SW 65km), Kroombit Tops, 24.ii.1982, D. Yeates (1♂, UQIC); Gatton, 3.viii and 19.x.1927, M.S. Evans (1♂1♀, QDPC, BMNH); Laidley, 2.ii.1928, ex: *Dysdercus sidae*, M.G. Evans (3♂1♀, BMNH, with pupae); Laidley, 18.x.1927, ex: *Dysdercus sidae*, M.S. Evans (1♂2♀, QDPC, BMNH); Sydney, Manly, 6.12.1923 (1♂, BMNH); Sunny Bank, 18.ix.1927 (1♀, UQIC); Tamborine Mts. (SE), 18-25.v.1935 (3♂1♀, BMNH); Yarraman (SE, 7 km W), 17.iv.1976, host: *Oncopeltus sordidus* [Dallas], A. Slater (1♂1♀, QDPC). **South Australia:** Adelaide, v.1962, C. Watts (1♂, CNCI); Edillilie (10 mi N), 7.xii.1968, N. McFarland (4♂, SAMA); Rev. [?], A.P. Burgess (1♂, SAMA). **Tasmania:** Mangalaze [?], 1908, A. White, B.M. 1917-104 (1♂, BMNH). **Victoria:** Princetown, Ocean Rd., 27.xi.1977, J.F. Donaldson (1♀, QDPC); Warburton, 9.12.18 (1♀, MVNH). **Western Australia:** Beverley (1♂, SAMA); Capel, 7.1.1957, A. Snell (3♀, MVNH); Dongara, 26.x-3.x.1935, R.E. Turner, B.M. 1935-240 (1♀, BMNH); Dumblebung, 27-30.x.1963, H. Udell (3♂1♀, WAMP); Slonevilla (17km N), Berry Res. [?], 11.xi.1992, T.F. Houston and R.P. McMillan (1♂, WAMP).

#### HOSTS

*Oncopeltus sordidus* (Hemiptera, Lygaeidae): - Australia (Cantrell 1986: 259).

*Dysdercus sidae* Montrouzier (Hemiptera, Pyrrhocoridae): - Australia (Crosskey 1973: 179).

#### 3.6.15 *Phasia singuliseta* Sun, sp. nov.

(Figures I-58, II-8.1)

#### TYPE MATERIAL

Holotype ♂, INDIA, Coimbatore, (ex: "new cotton bug"), 24.v.1922, Y.R. Rao Coll. (USNM); allotype ♀, INDIA, Coimbatore, (ex: "new cotton bug"), vi.1922, Y.R. Rao Coll., (USNM); paratype, 3♂, INDIA, Coimbatore, (ex: "new cotton bug"), 17 and 24. v.1922, Y.R. Rao Coll (USNM).

#### DESCRIPTION

Body length: 5-6 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as single ocellus. Fronto-orbital plate black with grey pruinosity, one row of hairs laterally (at middle). Frontal vitta brown, triangular. Frontal vitta at base of antennae 1.6 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.1-1.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black, yellow pruinose. Vibrissa well differentiated; intervibrissal dis-



tance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena black with grey pruinosity; hairs white; height 0.12 times eye height. Lunule black and shining, brown; sublunular bulla indistinct. Antenna pedicel yellow or brown; first flagellomere black, 1.1 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 1.3 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow.

**THORAX.** Mesoscutum thinly grey pruinose, without black longitudinal vitta or indistinct, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1 postpronotal seta; presutural supra-alar seta present, but fine; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 2 katepisternal setae; 5-7 meral setae. Scutellum black with grey pruinosity (thinly), with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula brown. Basicosta yellow. Wing hyaline, narrow; petiole of apical cell 0.40-0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur brown to black; hairs black. Fore tibia brown, without bristles, apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.2 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; hairs black. Mid tibia brown, with 2 *ad* and 1 *v*, apically with 1 *a*; 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur brown to black; hairs black. Hind tibia brown, arched, slightly shorter than hind femur, with 6 *ad* and 4 *pd*.

**ABDOMEN.** Abdominal tergites with yellow spot or area (syntergite I+II, tergite III, and anterior half of tergite IV yellow); pruinosity yellow; longitudinal vitta distinctly present. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:0.9:1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots of tergites IV and V indistinct. **TERMINALIA.** Syncercus broad, notched posteriorly, with two pairs of indistinct saw teeth. Surstylus longer than cercus, apex broadened, arched dorsally. Ejaculatory apodeme slender. Hypandrium shorter than phallapodeme. Pregonite small. Postgonite strong, bent ventrally, not pointed. Phallus broad and long, 2.6 times as long as hypandrium, haired dorsally on basal 1/2. Distiphallus membranous.

**FEMALE.** Wing hyaline. Eyes touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI, pointed apically, slightly bent, apex straight, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### HOST

Unknown.

#### ETYMOLOGY

The Latin "*singuliseta*" refers to the single row of fronto-orbital setae.

**3.6.16 *Phasia subcoleoprata* (Linnaeus, 1767)**

(Figures I-59, II-9.1)

*Conops subcoleoprata* Linnaeus 1767: 1006.*Phorantha musciformis* Rondani, 1861: 217.*Alophora abdominalis* Girschner, 1887: 415 (as *Alophora subcoleoprata* var.).*Alophora ornata* Girschner, 1887: 415 (as *Alophora subcoleoprata* var.).*Alophora (Phorantha) subcoleoprata*: Girschner, 1887: 40 - Brauer et Bergenstamm, 1889: 149 - Bezzi et Stein 1907: 584 - Draber-Moňko 1965: 119 (redescription).*Allophora subcoleoprata*: Baer 1921: 127 - Lundbeck 1927: 97.*Alophora subcoleoprata*: Stein 1924: 259 - Jachontov 1929: 2 - Rohdendorf 1933: 712 - Fedotov 1944: 134-136 - Rubtzov 1945: 87 - Tshernova 1947: 71-74 - Rohdendorf 1947: 86 - Fedotov 1947: 49 - Belanovskij 1951: 142.*Phorantha subcoleoprata*: Townsend 1938: 68.*Phasia subcoleoprata*: Dupuis 1949: 506, 1963: 105 - Dupuis and Genduso 1981: 1-7 - Schumakov 1958: 215.*Phasia musciformis*: Dupuis and Genduso 1981: 6 (biology).*Phasia (Phasia) subcoleoprata*: Herting 1984: 169 (catalog) - Herting and Dely-Draskovits 1993: 412 (catalog).**DESCRIPTION**

Body length: 7-11 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity; 1-2 row of hairs laterally. Frontal vitta reddish brown, with grey pruinosity. Frontal vitta at base of antennae 1.4-1.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face brown to black with grey pruinosity. Parafacial black with grey pruinosity, bare, 1.8-2.0 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, or black (rarely), grey pruinose. Vibrissa well differentiated; intervibrissal distance 0.9-1.0 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/3. Gena brown to black with grey pruinosity; hairs white; height 0.18-0.2 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.0-1.1 times as long as pedicel; arista thickened on basal 0.25. Length of oral opening 1.9-2.1 times its width. Occiput flattened, white pruinose; hairs white. Palpus yellow or brown.

**THORAX.** Mesoscutum strongly pruinose, with 4 black longitudinal vittae, with fine black hairs. 0+1 acrostichal seta; 0(1)+1 dorsocentral setae; 1-2 postpronotal setae; 0-1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron grey and yellow pruinose; hairs white or black. Anepimeral setae hair-like, black; 1 katapisternal seta; 7-12 meral setae. Scutellum black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula brown to black. Basicosta yellow. Wing pictured, from white with light brown infuscation to strongly pictured, narrow or broad; petiole of apical

cell 0.25-0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle, or almost at right angle (rarely). Halter yellow or brown. **LEGS.** Fore femur black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia black, with 1-2 *p*, apically with 1 *p* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.4-1.5 times as long as fifth tarsomere. Pulvilli brown. Mid femur black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs, or hairs black. Mid tibia black, with 1 *ad*, 1-2 *p* and 1 *v*, apically with 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs, or hairs black. Hind tibia black, slightly arched, with 2-3 *v*, one row of *ad* and *pd*.

**ABDOMEN.** Abdominal tergites totally black, or with yellow spot or area (only on outer side of syntergite I+II and tergite III); pruinosity of tergites present (silvery); longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:1.1; relative width I+II:III:IV:V = 0.4:1:1:0.8. Syntergite I+II shiny, pruinose, or not. Pruinosity of tergites III, IV, and V silvery, or yellow; hair spots indistinct. **TERMINALIA.** Syncercus broad, with a wide and shallow notch posteriorly, apex strongly bent ventrally. Surstylus slender, downward, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium broad, as long as phallapodeme. Epiphallus well developed. Pregonite reduced. Postgonite long, pointed. Phallus 1.2-1.3 times as long as hypandrium, with dense hairs. Distiphallus partly sclerotized.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes not touching. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) slightly longer than sternite VI, broadly flattened, broad apically, bent, apex directed ventrally, smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Conops subcoleoprata* Linnaeus 1767. Holotype sex [?], Sweden (location: Uppsala or lost, Townsend 1938:68, not examined).

#### OTHER MATERIAL EXAMINED

**CROATIA.** Sljeme and Bregi, 1.vii.1931 and 22.vii.1901, N.Baranov Collection (1♂1♀, USNM). **GREECE.** Llia, 3km NE Manolas, 30.iv.1979, A.E. Stubbs, B.M. 1983-90 (2♀, BMNH); Struma Vall., Macedonia, vi.1935, Shannon and Hadjiniclaou (1♀, USNM). **HUNGARY.** Budapest, Kertész, (3♂5♀, BMNH, CNCI, USNM); Baia, 29.vi.1929 (3♂, USNM); Keczel and Lac. Fertő, (2♂, CNCI, USNM); B.M. 1927-184 (1♂, BMNH). **ISRAEL.** Haifa, 30.v.1980, A. Freidberg (4♂1♀, USNM). **IRAQ.** Mosul, 29.iv.1958, E.S. Brown (7♂16♀ [2 with pupae], BMNH). **IRAN.** ex: *Eurygaster integriceps*, 1961 [no more data available] (1♀, DEBU); Varamine, Karagadj, 9.iv.1960, E.S. Brown (1♂1♀, BMNH). **MOROCCO.** D. Aubertin, B.M. 1935-336, Middle Atlas, Lake Aguelmani, 0.iv.1935, 700ft (1♂, BMNH). **SERBIA.** Nis., N.Baranov Collection (1♂1♀, USNM). **SPAIN.** Prov. Salamanca, Villar de Ciervo, 28.iv.1988 and 16.iv.1990,

Tschorsnig (1♂1♀, DEBU). **TURKEY.** Ankara, Beynam, 1,000m, 6.v.1962, Guichard and Harvey, B.M. 1962-299 (1♂1♀, BMNH); Diyarbakir, 4.v.1957, ex: *Eurygaster integriceps* (1♀, USNM); Kanqcaday-Diyarbakir, ix.26.1951, ex: *Eurygaster intogriceps*, (1♀, BMNH). **DOUBTFUL LOCALITIES.** "Digasbacker (?). 1957, ex: *Eurygaster integriceps*, ex: Mesnil Collection (1♀, CNCI)"; "Schiner, 1869b, Townsend's genotype collection (1♂, USNM)"; "ex: Girschner Collection, C.J. Wainwright, B.M. 1948-488, including syntypes of *Allophora subcoleoprata* var *abdominalis* Girschner (4♂1♀, BMNH)" "Europe (label data unreadable) (3♂2♀, BMNH, CNCI, DEIC)"; "Ex: Mesnil Collection (1♂1♀ with pupa, CNCI)"; "Juicia, H. Loew Collection (1♂, ZMHU)"; "Okp, Taluvecki, 1.v.1936 (1♀, ZMHU)".

### HOSTS

*Eurygaster integriceps* Puton (Hemiptera, Scutelleridae): - (Yakhontov 1929: 28 - de Fedotov 1944: 134, 1947: 50 - de Rubtzov 1945: 150, 1947: 85 - de Tchernova 1947: 73 - Schumakov 1951 - Kamenkova 1956: 327 - Lodos 1952: 23 - Dupuis 1963: 106 - Draber-Moňko 1965: 126).

*Dolycoris baccarum* (L.) (Hemiptera, Pentatomidae): - (Kamenkova 1956: 328 - Viktorov and Kozharina 1961: 53 - Dupuis 1963: 106 - Draber-Moňko 1965: 126).

*Dolycoris numidicus* (Horváth) (Hemiptera, Pentatomidae): - (Dupuis 1963: 106 - Draber-Moňko 1965: 126).

*Stagonomus amoenus* Brullé (Hemiptera, Pentatomidae): - (Dupuis 1963: 106 - Draber-Moňko 1965: 126).

### 3.6.17 *Phasia subnitida* Sun, sp. nov.

(Figures I-60, II-7.4)

### TYPE MATERIAL

Holotype ♂, [SOUTH AFRICA], Kaapmuiden [25°33"S, 31°20"E], 3.5.20, H.K. Munro (AMNH).

### DESCRIPTION

Body length: 11.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Eyes separated by a distance 0.5 times as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity, 2-3 rows of white hairs laterally. Frontal vitta reddish brown, divergent. Frontal vitta at base of antennae 1.4 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer and inner vertical setae absent. Face brown, grey pruinose. Parafacial brown, grey pruinose, bare, 1.8 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, orange yellow, greyish yellow pruinose. Vibrissa well differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with

bristles on lower 1/4. Gena brown, grey pruinose; hairs white; height 0.14 times eye height. Lunule normal; sublunular bulla indistinct. Antenna pedicel yellow or brown, first flagellomere black; first flagellomere 1.1 times as long as pedicel; arista thickened on basal 0.1. Length of oral opening 1.4 times its width. Occiput flattened, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum strongly grey pruinose, with 4 distinct black longitudinal vittae and yellow and black hairs. 0+1 acrostichal seta; 0+1 dorsocentral setae; 1 postpronotal seta; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black, white and yellow, without scale-like setae. Anepimeral setae medium size; yellow and black. 2 katapisternal setae. 5-8 meral setae. Scutellum brown, grey pruinose, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula brown. Basicosta brown. Wing pictured; broad; petiole of apical cell 0.36-0.40 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown and black; ventrally and laterally with whitish yellow hairs, dorsal surface with black hairs. Fore tibia brown and black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 1.5 times as long as fifth tarsomere. Pulvilli black. Mid femur brown and black; hairs black. Mid tibia brown and black, with 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *pd*, 1 *v* and 1 *d*. Hind femur brown and black; hairs black; scale-like setae absent. Hind tibia black, with 7-8 *ad* and 4 *pd*.

**ABDOMEN.** Abdominal tergites reddish yellow, with black longitudinal and transversal vittae; pruinosity present, but thin; tergites densely golden yellow hairs ventrally. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:0.9:1.1; relative width I+II:III:IV:V = 0.45:1:1:1. Hair spots indistinct. **TERMINALIA.** Syncercus broad and short, inner side with a pair of teeth; shallowly notched posteriorly. Surstylus extremely long; apex black, strongly bent dorsally. Ejaculatory apodeme slender. Hypandrium broad, as long as phallapodeme. Epiphallus indistinct. Pregonite reduced. Postgonite well developed, haired ventrally. Phallus long and broad; haired dorsally on basal 1/4. Distiphallus swollen, membranous.

**FEMALE:** Unknown.

## HOST

Unknown.

## ETYMOLOGY

*Phasia subnitida* is named for the thin abdominal pruinosity.

**3.6.18 *Phasia woodi* Sun, sp. nov.**

(Figures I-68, II-8.4)

**TYPE MATERIAL**

Holotype ♂, MALAYSIA, 3 Div., S'wak, Ulu Oya, Ng. Sekuau, 19.xii.1974, D. Munroe (CNCI); allotype ♀, same as holotype (CNCI); paratypes, 12♂17♀, same as holotype (CNCI); 1♀, CHINA, Taiwan, Chihpen, 10.vi.1972, H.M. Lin (BLKU); 1♀, THAILAND, Chiangdao, 5-11.iv.1958, T.C. Maa (BMBP); 20♂25♀, AUSTRALIA, N Queensland, Redlynch and Koah, 17.ix.10.x.1938, R.G. Wind (BMNH); 1♀, AUSTRALIA, Queensland, Kuranda, ix.1910, E.P. Dodd (AMNH); 1♀, AUSTRALIA, Queensland, Burpengary, 5-12-99, Dr. T.L. Bancroft (BMNH).

**DESCRIPTION**

Body length: 4-5 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes touching. Fronto-orbital plate yellow, grey pruinose, one row of hairs laterally (closed to frontal setae). Frontal vitta broadly triangle, black or brown. Frontal vitta at base of antennae 2.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine, or strong; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.7-0.8 times as wide as first flagellomere. Lower margin of face slightly projecting; brown and black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 2.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena brown and black with grey pruinosity; hairs black; height 0.08 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.2 times as long as pedicel; arista thickened on basal 0.3. Length of oral opening 1.3 times its width. Occiput flattened, white pruinose; hairs black. Palpus yellow and brown.

**THORAX.** Mesoscutum thinly pruinose (greyish brown), without longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 1+1(2) dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae strongly; black; 2-3 katepisternal setae; 7-9 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.32-0.35 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown and black; hairs black. Fore tibia brown and black, without bristles, apically with 1 *p* and 1 *d*. Fore tarsus black. Fore claws black; 0.9-1.0 time as long as fifth tarsomere. Pulvilli brown. Mid femur brown and brown, upper part black;

hairs black. Mid tibia brown and black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 0-1 *ad*, 0-1 *a*, 1 *av*, 1 *pv*, 1 *v* and 1 *d*. Hind femur brown and black; hairs black. Hind tibia black, with 4 *ad* and 3 *pd*.

**ABDOMEN.** Abdominal tergites black; pruinosity present, but thin; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus broad, posterior margin straight, U-notched posteriorly. Surstylus narrow, straight, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium as long as phallapodeme. Pregonite triangular. Postgonite furcate, shorter than pregonite. Epiphallus distinct. Phallus short, almost as short as hypandrium, not haired dorsally. Distiphallus sclerotized, apex pointed and strongly bent into hook-like.

**FEMALE.** Wing hyaline. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI, pointed apically, slightly bent, apex, lateral flattened, directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### HOST

Unknown.

#### ETYMOLOGY

This specific name is a patronym in honour of Dr. D.M. Wood, for his contribution to the taxonomy of Nearctic *Phasia* Latreille (Wood 1987b).

### 3.7. The *Phasia varicolor* species-group

The *Phasia varicolor* species-group includes the species previously placed in *Besserioides* (*sensu* Crosskey 1973, 1976), *Bogosiella* (*sensu* Crosskey 1984), *Alophorophasia* Townsend (*sensu* Crosskey 1976), *Efftayloria* Malloch (*sensu* Crosskey 1973), *Bogosiella* Villeneuve, *Heyneophasia* Townsend, *Xanthotrichius* Townsend, *Xiphophasia* Townsend, *Trichophasia* Townsend and *Androeuryps* Benaway. The Neotropical species, the species of *Alophorophasia* Townsend (*sensu* Crosskey 1976) and *Efftayloria* Malloch (*sensu* Crosskey 1973) are excluded from the current revision.

**Diagnosis:** Frons wider than ocellus; fronto-orbital plate bare or with 1-2 rows of hairs laterally; dorsal facets of eyes same size as ventral facets; inner margins of eyes usually parallel or nearly so. Parafacial bare; lower margin of face usually projecting; oral opening short. Thorax black or brown, pruinose or not. Scutellum black, with two pairs of marginal setae. Abdomen subovate or slender.

Key to species of the *Phasia varicolor* species-group

(The males of *Phasia mathisi* and *Phasia sumatrana*, and the female of *Phasia latifrons* are unknown.)

1. Mesonotum and tergites strongly pruinose; abdomen slender; male and female terminalia as Figure I-16..... *P. cylindrata* Sun, new species.
- Mesonotum and tergites not pruinose, or thinly pruinose; abdomen round; male and female terminalia variations ..... 2
2. Female ..... 3
- Male..... 9
3. Sternite VII strongly bent ventrally ..... 4
- Sternite VII not bent ventrally ..... 5
4. Frons parallel; eyes separated by a distance wider than ocellar triangle (Fig.I-62.2).....  
..... *P. sumatrana* Sun, new species ♀
- Frons divergent; eyes separated by a distance narrower than ocellar triangle .....  
..... *P. minima* Sun, new species ♀
5. Abdomen reddish yellow ..... 6
- Abdomen black, or mostly black..... 7
6. Sternite VII short and broad; apex rounded in ventral view (Fig. I-64.6) .....  
..... *P. triangulata* Sun, new species ♀
- Sternite VII slender, apex pointed in ventral view (Fig. I-52.7) .....  
..... *P. rotundata* Sun, new species ♀
7. Eyes separated by a distance wider than ocellar triangle ..... 8
- Eyes almost touching each other ..... *P. normalis* (Curran, 1927) ♀ (see page 135)
8. Flagellomere yellow; tergite V long, tapered ..... *P. varicolor* (Curran, 1927) ♀
- Flagellomere black; tergite V short, trapezoid ..... *P. mathisi* Sun, new species ♀
9. Abdomen reddish yellow ..... 10
- Abdomen black or with dark yellow spots only..... 12
10. Distiphallus branched; syncercus deeply notched posteriorly .....  
..... *P. varicolor* (Curran, 1927) ♂
- Distiphallus not branched; syncercus not notched or only shallowly notched posteriorly  
..... 10
11. Surstylus as long as cercus; pregonite developed .....  
..... *P. rotundata* Sun, new species ♂
- Surstylus much longer than cercus; pregonite even, not developed .....  
..... *P. triangulata* Sun, new species ♂
12. Abdomen shining, without pruinosity; pregonite longer than postgonite; syncercus with a semicircular notch posteriorly ..... *P. minima* Sun, new species ♂
- Abdomen grey pruinose; pregonite shorter than postgonite; syncercus not notched as above  
..... 13



13. Eyes separated by a distance narrower than ocellar triangle; syncercus widely U-notched posteriorly; phallus haired ..... *P. normalis* (Curran, 1927) ♂ (see page 135)
- Eyes separated by a distance wider than ocellar triangle; syncercus V-notched posteriorly; phallus not haired ..... *P. latifrons* (Paramonov, 1958) ♂

### 3.7.1 *Phasia cylindrata* Sun, sp. nov.

(Figures I-16, II-3.3)

#### TYPE MATERIAL

Holotype ♂, PAPUA NEW GUINEA, Wau, 1,200m, 22.x.1965, J and M. Sedlacek (BPBM); allotype ♀, same as holotype; paratypes, 1♂1♀, PAPUA NEW GUINEA, Vogelkop, Jef Lio I. Sele Straits, 1-5m, 15.viii.1957, D.E. Hardy (BPBM); 4♀, PAPUA NEW GUINEA, Wau, 1,200m, 11-25.x.1965, J and M. Sedlacek (BPBM); 2♀, PAPUA NEW GUINEA, Wau, Morobe Distr., 1,200m, 7.vii.1961 and 23.ix.1962, J. and M. Sedlacek (BPBM); 1♀, PAPUA NEW GUINEA, Dreikikir, Sepik Distr., 400m, 25.vi.1961, J.L. and M. Gressitt (BPBM); 2♀, [PAPUA NEW GUINEA], New Britain, Keravat, 22.vi.1965, 3.vii.1965 and 15.x.1968, R.W. Crosskey and N.L.H. Krauss (BMNH, BPBM).

#### DESCRIPTION

Body length: 5-7 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity, 1-2 rows of hairs laterally (closed to frontal setae). Frontal vitta black, broad. Frontal vitta at base of antennae 2.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face slightly projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 2.7 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena black with grey pruinosity; hairs black and yellow; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.6-1.7 times as long as pedicel; arista thickened on basal 1/3. Length of oral opening 1.1-1.2 times its width. Occiput slightly convex, greyish yellow pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum strongly yellowish grey pruinose, even, without black longitudinal vitta, with fine black hairs. 0+1(2) acrostichal setae; 1(2)+1(2) dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black; and without scale-like setae. Anepimeral setae hair-like, black; 3 katepisternal setae; 4-5 meral setae. Scutellum black, shining, without pruinosity, with two pairs of mar-

ginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing pictured; white with light brown infuscation only, extremely narrow; petiole of apical cell 0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *d*. Fore tarsus normal; brown. Fore claws yellow; 1.1 times as long as fifth tarsomere. Pulvilli yellow. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *pv*, 1 *p*, 2 *v* and 1 *d*. Hind femur black; hairs black; scale-like setae absent. Hind tibia brown; postero-dorsal side gold yellow pruinose, with 5 *pd* and 5-6 *ad*.

**ABDOMEN.** Abdomen slender; Abdominal tergites black; pruinosity golden yellow; longitudinal vitta absent; syntergite I+II with purple area on middle area. Relative length of abdominal tergites I+II:III:IV:V = 1.3:1:1:1.2; relative width I+II:III:IV:V = 0.8:1:1:0.9. Hair spots distinct. **TERMINALIA.** Syncercus triangular, V-notched posteriorly; apex bent downward. Surstylus flattened, straight, longer than cercus. Ejaculatory apodeme small, knob-like. Hypandrium broad, slightly shorter than phallus and phallapodeme. Phallapodeme not arched. Pregonite triangular. Postgonite shorter than pregonite, apex spherical. Epiphallus sclerotized. Phallus short, without fine hairs dorsally. Distiphallus partly sclerotized, swollen, apex slender, pointed and bent.

**FEMALE:** Body size smaller than male. Wing hyaline. Eyes separated by a distance wider than the flagellomere. Mesoscutum greyish brown pruinose. Anterior spine-like setae of hind tibia present. Abdominal tergites black shining. Sternite VII (sheath) longer than sternite VI, pointed, apex bent, directed dorsally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### HOST

Unknown.

#### ETYMOLOGY

*Phasia cylindrata* is named for its slender abdomen.

#### 3.7.2 *Phasia latifrons* (Paramonov, 1958), comb. nov.

(Figures I-29, II-3.2)

*Besserioides latifrons* Paramonov, 1958: 596 - Crosskey 1973: 111 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

#### DESCRIPTION

Body length: 2.5 mm.

**MALE: HEAD.** Head compressed anteriorly. Vertex 0.25 times as wide as head

width; eyes separated by a distance wider than ocellar triangle. Fronto-orbital plate black, brownish grey pruinose, 1-2 rows of hairs laterally. Frontal vitta broad, almost parallel. Frontal vitta at base of antennae 2.8 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 4 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena black with grey pruinosity; hairs black; height 0.12 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 2.1 times as long as pedicel; arista thickened on basal 1/3. Length of oral opening 1.3 times its width. Occiput slightly convex, white pruinose; hairs black. Palpus black.

**THORAX.** Mesoscutum thinly pruinose, even, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 1+1 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae strongly; black; usually 1 katepisternal setae; 4-5 meral setae. Scutellum black; almost shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter yellow. **LEGS.** Fore femur black; hairs black, with one row of long *ad*. Fore tibia black, without bristles, apically with 1 *av*, 1 *pv* and 1 *d*. Fore tarus black. Fore claws brown, apex black; 0.9 times as long as fifth tarsomere. Pulvilli black. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, apically with 1 *pd*. Hind femur black; hairs black. Hind tibia black, with 3 *ad* and 3 *pd*.

**ABDOMEN.** Abdominal tergites black, syntergite I+II and most part of tergite III dark yellow; grey pruinose; longitudinal vitta absent; outer margin and hind margin of tergites with long setae. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.6:1:1:0.8. Hair spots distinct. **TERMINALIA.** Syncercus broad triangular, V-notched posteriorly. Surstylus flattened, bent dorsally, longer than cercus. Ejaculatory apodeme short, knob-like. Hypandrium as long as phallapodeme. Pregonite even, with two saw teeth ventrally. Postgonite long, pointed. Phallus without fine white hairs dorsally, 1.3 times as long as hypandrium. Epiphallus small, partly sclerotized. Phallapodeme not arched. Dorsolateral process longer than ventrolateral process. Ventrolateral process well sclerotized, with several saw teeth apically.

**FEMALE:** Unknown.

**TYPE MATERIAL**

Holotype ♂, [AUSTRALIA, Australian Capital Territory], A.C.T. Bentora, 5.ii.1952, S.J. Paramonov (ANIC, examined).

**HOST**

Unknown.

**3.7.3 *Phasia mathisi* Sun, sp. nov.**

(Figures I-34.1-4, II-3.4)

**TYPE MATERIAL**

Holotype ♀, [SEYCHELLES], Aldabra, Picard: Settlement, 15-21.iii.1986, W.N. Mathis (USNM); paratypes, 4♀, same as holotype (USNM); 1♀, KENYA, Kericho, Kimariestate, 15.iii.1966 (with pupa, BMNH).

**DESCRIPTION**

Body length: 6 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance 1.5 times as wide as ocellar triangle. Fronto-orbital plate black; shining, 1-2 rows of hairs laterally. Frontal vitta brown, almost parallel. Frontal vitta at base of antennae 2 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae absent; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.9 times as wide as first flagellomere. Lower margin of face almost perpendicular, not projecting; black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 1.5 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs black; height 0.12 times eye height. Lunule normal; sublunular bulla indistinct. Antenna pedicel yellow or brown; first flagellomere black, 1.2 times as long as pedicel; arista thickened on basal 1/3. Length of oral opening 1.3 times its width. Occiput slightly convex, white pruinose; hairs white and black. Palpus yellow.

**THORAX.** Mesoscutum grey pruinose, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 0+1 dorsocentral seta; 1-2 postpronotal setae; presutural supra-alar seta absent; 0 postsutural intra-alar seta; 2 notopleural setae; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae hair-like, black; 2 katepisternal setae; 6-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta black. Wing hyaline, narrow; petiole of apical cell 0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right

angle. Halter brown. **LEGS.** Fore femur black; hairs black. Fore tibia black, without bristles, apically with 1 *pv* and 1 *d*. Fore tarus black. Fore claws black; as long as fifth tarsomere. Pulvilli brown. Mid femur black; hairs black. Mid tibia black, with 1 *ad*, 1 *a*, 2 *p* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur black; hairs black. Hind tibia black, with 3 *ad* and 3 *pd*. Anterior spine-like setae of hind tibia absent.

**ABDOMEN.** Abdominal tergites black; pruinosity absent; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.2:1:1:0.4; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots indistinct. **TERMINALIA.** Sternite VII (sheath) longer than sternite VI, pointed apically, bent, apex directed dorsally, smooth ventrally. Ovipositor bent upward.

**MALE:** Unknown.

#### HOST

Unknown.

#### ETYMOLOGY

This specific patronym is in honour of the collector, Dr. W.N. Mathis.

#### 3.7.4 *Phasia minima* Sun, sp. nov.

(Figures I-36, II-3.2)

#### TYPE MATERIAL

Holotype ♂, PAPUA NEW GUINEA, NE Wau, Morobe Distr., 1,200m, 8.vii.1961, J. Sedlacek [malaise trap] (BPBM); allotype ♀, PAPUA NEW GUINEA, Wau, 1,230m, 11.vi.1965, J. and M. Sedlacek [malaise trap] (BPBM); paratypes, 1♀, PAPUA NEW GUINEA, NE Wau, Big Wau Ck., 1,300m, xi.1963, P. Shanahan (BPBM); 1♀, PAPUA NEW GUINEA, Morobe Distr., NE Wau, Kunai Ck., 1,250m, 26.viii.1963 (BPBM); 1♀, PAPUA NEW GUINEA, New Britain, Gazelle Pen., Upper Warangoi, Illugi, 220m, 15.xii.1962, J. Sedlacek [malaise trap] (BPBM).

#### DESCRIPTION

Body length: 3.5-4 mm.

**MALE: HEAD.** Head spherical or nearly so. Eyes separated by a distance as wide as ocellar triangle. Fronto-orbital plate black with grey pruinosity. Frontal vitta almost parallel, black. Frontal vitta at base of antennae 4 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.3 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, black with grey pruinosity. Vibrissa well differentiated; intervibrissal distance 3 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena brown

and black with grey pruinosity; hairs black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.8 times as long as pedicel; arista thickened on basal 1/5. Length of oral opening 1.2 times its width. Occiput slightly convex, greyish yellow pruinose; hairs black. Palpus brown to black.

**THORAX.** Mesoscutum thinly pruinose; even, with fine black hairs. 0+1 acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black. 2-5 katepisternal setae; 5-6 meral setae; Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta black. Wing light brown hyaline, narrow; petiole of apical cell 0.35 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown; hairs black. Fore tibia brown, without bristles, apically with 1 *p* and 1 *d*. Fore tarsus normal; brown. Fore claws brown, apex black; 1.1 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown; hairs black. Mid tibia brown, apically with 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur brown; hairs black. Hind tibia brown, with 2-4 *ad* and 2-4 *pd*.

**ABDOMEN.** Abdominal tergites black, with dark yellow spot or area; pruinosity absent; longitudinal vitta distinctly present; tergites I+II, III and lateral margin of tergite IV dark yellow. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.7. Hair spots indistinct. **TERMINALIA.** Syncercus slender, with a shallow notch posteriorly; apex extremely bent downward. Surstylus flattened, slightly arched dorsally, almost as long as cercus. Hypandrium broad, slightly shorter than phallapodeme. Ejaculatory apodeme small, knob-like. Pregonite extremely long, apex spherical, with sparse hairs dorsally. Postgonite triangular, shorter than pregonite. Phallus broad, short, almost as short as phallapodeme, not haired. Distiphallus membranous, branched.

**FEMALE.** Usually smaller than male. Wing hyaline. Eyes separated by a distance as wide as single ocellus. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) almost as long as sternite VI, broad apically, bent, apex directed ventrally, sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

#### HOST

Unknown.

#### ETYMOLOGY

The specific name *minima* refers to the small body size of this species.

**3.7.5 *Phasia rotundata* Sun, sp. nov.**

(Figures I-52, II-3.1)

**TYPE MATERIAL**

Holotype ♂, [AUSTRALIA], South Australia, 9km NW Andamooka HS., Sandhills, from flowering *Acacia* sp. 1.xi.1975, J.A. Herridge (SAMA); allotype ♀, [AUSTRALIA], New South Wales, Trangie, 10.ix.1979, P. Allsopp (QDPC), paratypes, 1 ♂, [AUSTRALIA], Kings Mill Ck., nr. Arkaroola homestead, 29.x.1969, G.F. Gross [malaise trap] (SAMA); 1 ♂, [AUSTRALIA], New South Wales, Mount Hope, 9.x.1980, J.C. Sovef (UQIC); 1 ♂, [AUSTRALIA], N. Territories, Gold Coast, Tomaklaw, 1.2.1916, Dr. J.J. Simpson (BMNH).

**DESCRIPTION**

Body length: 5-6 mm.

**MALE: HEAD.** Head spherical or nearly so. Vertex 0.22 times as wide as head width. Fronto-orbital plate black; greyish yellow pruinose, 2-3 rows of hairs laterally. Frontal vitta parallel, brown. Frontal vitta at base of antennae 4.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present (but fine); inner vertical setae absent. Face black, greyish yellow pruinose. Parafacial brown, greyish yellow pruinose, bare, 0.9 times as wide as first flagellomere. Lower margin of face slightly projecting, visible in profile, brown, greyish yellow pruinose. Vibrissa well differentiated; intervibrissal distance 1.8 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena brown to black with grey pruinosity; hairs black; height 0.15 times eye height. Lunule brown to black and shining; sublunular bulla indistinct. Antenna yellow (but dorsal of flagellomere black); first flagellomere 1.3 times as long as pedicel; arista thickened on basal 2/3. Length of oral opening 1.5 times its width. Occiput slightly convex, without distinctly pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum black, thinly grey pruinose; even, without black longitudinal vitta, with fine black hairs. 0+1 acrostichal seta; 1+2(3) dorsocentral setae; 2-3 postpronotal setae; presutural supra-alar seta present, but fine; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 2 katepisternal setae; 6-8 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula brown. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur brown to black; hairs black. Fore tibia black, without bristles, apically with 1 *pv*, 1 *p* and 1 *d*. Fore tarus black. Fore claws brown; apex black, as long as fifth tarsomere. Pulvilli brown. Mid femur brown to black; hairs black. Mid tibia black, with 0-1 *ad* and 1

v, apically with 1 *ad*, 1 *pv* and 0-1 *d*. Hind femur brown to black; hairs black. Hind tibia black, slightly arched, with 4-5 *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites spherical, reddish yellow; pruinosity absent (shining); longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1.1; relative width I+II:III:IV:V = 0.6:1:1:0.9. Hair spots indistinct. **TERMINALIA.** Syncercus with a small notch posteriorly; apex bent downward. surstylus broad, slightly arched dorsally; as long as cercus. Hyandrium shorter than phallapodeme. Ejaculatory apodeme small, knob-like. Pregonite short, apex rounded. Postgonite triangular, pointed, longer than pregonite, with sparse hairs ventrally. Phallus 1.5 times as long as hyandrium, with fine hairs dorsally on basal 1/2. Distiphallus partly sclerotized.

**FEMALE.** Body size smaller than male. Wing hyaline. Eyes separated by a distance as wide as ocellar triangle. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) longer than sternite VI, triangular, pointed apically, not bent, apex straight, smooth ventrally. Ovipositor bent upward.

#### HOST

*Serinettha mitellata* (Hemiptera, Coreidae): - AUSTRALIA (New South Wales, pupal duration: 27.viii.1979-10.ix.1979) (new record).

#### ETYMOLOGY

This specific name is from the Latin "*rotundus*", which refers to the spherical abdomen of this species.

#### 3.7.6 *Phasia sumatrana* Sun, sp. nov.

(Figures I-62.1-5, II-3.2)

#### TYPE MATERIAL

Holotype ♀, INDONESIA, Sumatra, Danau Toba, 800-1,200m, 24-25.xi.1973, H. Kurahashi (BLKU); paratype, 1 ♀, same as holotype (BLKU).

#### DESCRIPTION

Body length: 3 mm.

**FEMALE: HEAD.** Head spherical or nearly so. Vertex 0.25 times as wide as head width; eyes separated by a distance wider than ocellar triangle. Fronto-orbital plate extremely narrow, black with grey pruinosity. Frontal vitta black or brown, broad, parallel. Frontal vitta at base of antennae 5-6 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.2 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 4.0-4.5 times distance between



vibrissa and eye on same side; facial ridge with bristles on lower 1/5. Gena narrow brown to black with grey pruinosity; hairs black; height 0.1 times eye height. Lunule black and shining; sublunular bulla indistinct. Antenna black; first flagellomere 1.5 times as long as pedicel; arista thickened on basal 1/4. Length of oral opening 1.1 times its width. Occiput flattened, greyish yellow pruinose; hairs black. Palpus brown.

**THORAX.** Mesoscutum thinly pruinose, without black longitudinal vitta, with fine black hairs. 0+1(0) acrostichal seta; 1+2 dorsocentral setae; 2 postpronotal setae; presutural supra-alar seta present, strong; 1 postsutural intra-alar seta; 2 notopleural setae; 1-2 supra-alar setae; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 2-3 katepisternal setae; 4-5 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter white with light brown infuscation. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.45 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow. **LEGS.** Fore femur brown; hairs black. Fore tibia brown, without bristles, apically with 1 *p* and 1 *d*. Fore tarus brown. Fore claws black; 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur brown; hairs black. Mid tibia brown, with 1 *v*, apically with 1 *av*, 1 *pv* and 1 *d*. Hind femur brown; hairs black, with 4 long *av*. Hind tibia brown, with 4-5 *ad* and 1-2 *pd*. Anterior spine-like setae of hind tibia absent.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area; pruinosity absent; longitudinal vitta absent; tergites I+II, II, III brown, tergites IV, V black. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.35:1:1:0.7. Hair spots indistinct. Sternite VII (sheath) slightly longer than sternite VI; broad apically; bent, apex directed ventrally; sternite VII with linear wrinkles ventrally. Ovipositor bent upward.

**MALE:** Unknown.

## HOST

Unknown.

## ETYMOLOGY

*Phasia sumatrana* is derived from the holotype locality, Sumatra, Indonesia.

### 3.7.7 *Phasia triangulata* Sun, sp. nov.

(Figures I-64, II-3.1)

## TYPE MATERIAL

Holotype ♀, SRI LANKA, Amp. Dist., Ekgal Aru Tank, 100m, 19-23.ii.1977, K.V. Krombein, P.B. Karunaratne, P. Fernando and D.W. Balasooriya (USNM); allotype ♂,

INDIA, Saharanpur, 114.vii.1989, ex: *Leptocokis augus* (?), CIEA 21003 (BMNH); paratype, 1♀, same as allotype (BMNH).

### DESCRIPTION

Body length: 6-7.5 mm.

**MALE: HEAD.** Head spherical or nearly so. Vertex 0.15 times as wide as head width; eyes separated by a distance slightly wider than ocellar triangle. Fronto-orbital plate black with grey pruinosity, 2-3 rows of hairs laterally. Frontal vitta brown to black, almost parallel. Frontal vitta at base of antennae 4.2 times as wide as fronto-orbital plate anteriorly. Ocellar setae present but fine; outer vertical setae present; inner vertical setae absent. Face black with grey pruinosity. Parafacial black with grey pruinosity, bare, 0.6 times as wide as first flagellomere. Lower margin of face projecting, visible in profile, brown, grey pruinose. Vibrissa well differentiated; intervibrissal distance 1.6 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/4. Gena black with grey pruinosity; hairs black; height 0.12 times eye height. Lunule brown to black, shining; sublunular bulla indistinct. Antenna yellow (dorsal of flagellomere black); first flagellomere 1.8 times as long as pedicel. Length of oral opening 1.3-1.5 times its width. Occiput slightly convex; white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum black, thinly pruinose, even, with fine black hairs. 0+1 Acrostichal seta; 1+2 dorsocentral setae; 2-3 postpronotal setae; presutural supra-alar seta absent; 1 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron brown, thinly grey pruinose; hairs black. Anepimeral setae medium size, black; 2 katapisternal setae; 8-10 meral setae. Scutellum black, shining, without pruinosity, with two pairs of marginal setae; apical setae present and distinct; discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white (or yellow). Wing base without scale-like setae. Tegula brown. Basicosta yellow. Wing hyaline, narrow; petiole of apical cell 0.3 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  almost at right angle. Halter brown. **LEGS.** Fore femur yellow; one row of *d* and *pv*, hairs black. Fore tibia yellow, without bristles, apically with 1 *p* and 1 *d*. Fore tarsus normal; brown. Fore claws brown, apex black, 0.9 times as long as fifth tarsomere. Pulvilli brown. Mid femur yellow; hairs black. Mid tibia brown, with 1 *ad*, 1 *p* and 1 *v*, apically with 1 *ad*, 1 *a*, 1 *av*, 1 *pv*, 1 *p*, 1 *v* and 1 *d*. Hind femur yellow; one row of *av*, *pv* and *ad*, hairs black. Hind tibia yellow to brown, with 4 *pd* and 3 *ad*.

**ABDOMEN.** Abdominal tergites yellow or with yellow area; pruinosity absent; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1.1:1:1.1; relative width I+II:III:IV:V = 0.5:1:1:0.8. Hair spots indistinct. **TERMINALIA.** Syncercus without distinct notch posteriorly; apex bent ventrally. Surstylus straight, longer than cercus. Hypandrium shorter than phallapodeme. Ejaculatory apodeme small, knob-like. Pregonite reduced. Postgonite triangular, long, pointed. Phallus long, 1.6 times as long as hypandrium, haired dorsally on basal 1/2. distiphallus swollen, membranous.

**FEMALE.** Usually smaller than male. Wing hyaline. Anterior spine-like setae of hind tibia absent. Sternite VII (sheath) triangular, narrow apically, not bent, apex straight, smooth ventrally. Ovipositor bent upward.

#### HOST

*Leptocoris augur* (Fabricius) (Hemiptera, Rhopalidae): New record. India.

#### ETYMOLOGY

This name is from the Latin "*triangulus*", and refers to the triangular sternite VII of female.

#### 3.7.8 *Phasia varicolor* (Curran, 1927), comb. nov.

(Figures I-66. II-3.1)

*Catharosia varicolor* Curran, 1927: 165.

*Besserioides varicolor*: Crosskey 1973: 111 (catalog) - Cantrell and Crosskey 1989: 735 (catalog).

*Besserioides sexualis* Curran, 1938: 185.

#### DESCRIPTION

Body length: 6.5-7 mm.

**MALE: HEAD.** Head spherical or nearly so. Vertex 0.25 times as wide as head width; eyes separated by a distance 2 times as wide as ocellar triangle. Fronto-orbital plate brown to black, greyish yellow pruinose, 2-3 rows of hairs laterally. Frontal vitta broad, brown, parallel. Frontal vitta at base of antennae 2.5 times as wide as fronto-orbital plate anteriorly. Ocellar setae strong; outer vertical setae present; inner vertical setae absent. Face brown to black, greyish yellow pruinose. Parafacial brown to black, greyish yellow pruinose, bare, 0.9 times as wide as first flagellomere. Lower margin of face slightly projecting, visible in profile, orange yellow, yellow pruinose. Vibrissa well differentiated; intervibrissal distance 1.1 times distance between vibrissa and eye on same side; facial ridge with bristles on lower 1/6. Gena brown, yellow pruinose; hairs black; height 0.12 times eye height. Lunule brown, normal; sublunular bulla indistinct. Antenna brown to black; first flagellomere 2.1 times as long as pedicel; arista thickened on basal 0.33. Length of oral opening 1.2 times its width. Occiput slightly convex, white pruinose; hairs white. Palpus brown.

**THORAX.** Mesoscutum black, thinly grey pruinose; postpronotal brown, with fine black hairs. 0+1 Acrostichal seta; 0+1(2) dorsocentral setae; 1-2 postpronotal setae; presutural supra-alar seta present, strong; 0 postsutural intra-alar seta; 2 notopleural setae; 1 supra-alar seta; 2 postalar setae. Pleuron thinly grey pruinose; hairs black. Anepimeral setae hair-like, black; 3 katepisternal setae; 5-6 meral setae. Scutellum dark brown to black with grey pruinosity, with two pairs of marginal setae; apical setae present and distinct;

discal setae randomly arranged, not in rows. Subscutellum not very prominent. **WING.** Lower calypter hyaline white. Wing base without scale-like setae. Tegula black. Basicosta brown. Wing hyaline, narrow; petiole of apical cell 0.2 times as long as preceding section of  $R_{4+5}$ ; M meeting  $R_{4+5}$  at acute angle. Halter yellow. **LEGS.** Fore femur brown to black; hairs black. Fore tibia black, without bristles, apically with 1 *v*, 1 *pv* and 1 *d*. Fore tarsus black. Fore claws brown, apex black, 0.9 times as long as fifth tarsomere. Pulvilli yellow. Mid femur brown to black; hairs black. Mid tibia black, with 1 *ad* and 1 *v*, apically with 1 *ad*, 1 *av*, 1 *pv*, 1 *pd*, 1 *v* and 1 *d*. Hind femur brown to black; hairs black. Hind tibia black, with 4 *ad* and 3-4 *pd*.

**ABDOMEN.** Abdominal tergites black, with yellow spot or area (or whole yellow); pruinosity absent; longitudinal vitta absent. Relative length of abdominal tergites I+II:III:IV:V = 1.1:1:1:1; relative width I+II:III:IV:V = 0.5:1:1:0.9. Hair spots indistinct. **TERMINALIA.** Syncercus triangular, deeply notched posteriorly; lateral side of cercus bent downward. Surstylus shorter than cercus, apex bent dorsally. Hypandrium broad, longer than phallapodeme. Ejaculatory apodeme slender. Pregonite reduced, with fine hairs ventrally. Postgonite long, bent ventrally, pointed. Epiphallus long, needle-like. Phallus slender, almost as long as hypandrium, sparsely haired dorsally on basal 1/2. Distiphallus membranous, branched.

**FEMALE.** Wing hyaline. Vertex 0.2 times as wide as head width. Anterior spine-like setae of hind tibia absent. Abdomen brown to black. Sternites V, VI broad. Sternite VII (sheath) triangular, longer than sternite VI, narrow apically, bent, apex directed dorsally, smooth ventrally. Ovipositor bent upward.

#### TYPE MATERIAL

*Catharosia varicolor* Curran, 1927. Holotype ♂, AUSTRALIA, Queensland, Biloela, 10.iii.1927, ex: *Dysdercus sidae*, E. Ballard (BMNH, examined); paratypes, 2♀, AUSTRALIA, Queensland, Brisbane, 26-27.iv.1926, E. Ballard, ex: *Dysdercus sidae* (BMNH, USNM, examined); 2♀, AUSTRALIA, Queensland, Biloela, xi.1927, ex: *Dysdercus sidae* E. Ballard (USNM, BMNH, examined).

*Besserioides sexualis* Curran, 1938. Holotype ♂, [AUSTRALIA], Queensland, Laidley, 1.v.1928, ex: *Dysdercus sidae* M.G. Evans (BMNH, examined); paratypes, 1♂1♀, [AUSTRALIA], Queensland, Brisbane, 2.ix.1927, ex: *Dysdercus sidae* M.G. Evans (BMNH, USNM, examined); 1♀, [AUSTRALIA], Gattton, 29.viii.1927, M.G. Evans (BMNH, examined).

#### OTHER MATERIAL EXAMINED

**AUSTRALIA:** Queensland, Biloela, 25.iv.1927, G.A. Curran, ex: *Dysdercus sidae* (1♂, BMNH); Bardon, Bne, 7-11.1947, A.C. Arvier (1♂, UQIC). **SRI LANKA:** Anuradhapura, 29.iv.1939, J.C. Hutson, ex: *Dysdercus cingulatus*, (1♀, BMNH). **INDIA:** Varanasi, Banaras Hindy Univ., 28.xi.1981, ex: *Dysdercus koanigii*, R.K. Tripathi (1♀, BMNH);

Ujjain, Vikram Univ., i.1964 (1♀, BMNH); Pusa, Bihar, Gravelly, 5-10.xi.1915 (1♀, USNM); Jammv Tawi, 1971, ex: *Dysdercus koenigii* (1♀, BMNH).

## HOSTS

*Dysdercus sidae* Montrouzier (Hemiptera, Pyrrhocoridae): -AUSTRALIA (Crosskey 1973: 179).

*Dysdercus koenigii* Fabr. (Hemiptera, Pyrrhocoridae): - INDIA.

*Dysdercus cingulatus* Fabr. (Hemiptera, Pyrrhocoridae): - SRI LANKA.

## 4. Phylogeny and Biogeography

### 4.1. Definition of *Phasia*

The following synapomorphies provide evidence for the monophyly of *Phasia*:

(1). The piercing ovipositor (sternite VIII) and associated sheath-like sternite VII of the female provide strong evidence that *Phasia* is monophyletic. In contrast, other genera in the tribe Phasiini, such as *Ectophasia* and *Trichopoda*, have a short, membranous ovipositor, which is not visible in profile. *Phasia* females can penetrate the host's chitinous exoskeleton and inject eggs inside. Females of *Ectophasia* and *Trichopoda* lay macrotype eggs on the host body instead of into the host.

(2). Characters of the egg also provide evidence for the monophyly of *Phasia*. Since the female lays a cylindrical egg in the host, and the eggs do not need to be protected against the harsh outer environment, the eggshell is often very thin, without specific structures for adhering to the host's body.

(3). An apical cell with a long petiole is a possible synapomorphy of *Phasia*, but occurs elsewhere in the Phasiinae. The Oriental genus *Perigymnosoma*, and some species of *Gymnosoma* and *Gymnoclytia* share this character with *Phasia*. Although some species of *Trichopoda* and *Ectophasia* also have a petiole, it is relatively short (not longer than *r-m*).

(4). Another possible synapomorphy of *Phasia* is the absence of teeth on the apex of the first instar larval mouth hook. This character, noted by Dupuis (1963), can also be found in the genus *Elomyia*.

### 4.2. In-group relationships and distributional patterns of *Phasia*

Six species-groups are recognized. The *Phasia argentifrons*, *Phasia barbifrons* and *Phasia varicolor* species-groups are considered monophyletic groups, well-supported on the basis of several synapomorphies. The *Phasia hemiptera*, *Phasia pusilla* and *Phasia subcoleoptrata* species-groups are paraphyletic groups, but they are diagnosable and correspond to long-recognized subgenera or genera. It is recognised that paraphyletic groups are not

units of evolution, but they are retained here partly because of their utility as diagnosable units and partly because of the current impracticality of dividing *Phasia* into strictly monophyletic species groups. Largely because of the overwhelming amount of homoplasy in the entire character set, the consistency indices for the cladograms presented are very low. This suggests that there is inadequate support to use these cladograms as a basis for naming new groups. Furthermore, the topology of the cladogram for the whole genus is such that the division of *Phasia* into strictly monophyletic groups would lead either to the splintering of the genus into a large number of very small species groups, or would demand the lumping of currently diagnosable groups into a few large species groups. Considering these points, we have opted for the pragmatic combination of naming useful monophyletic species groups where possible, while still retaining diagnosable but paraphyletic residual species groups.

Analysis of the total character matrix using the parsimony program Hennig86 (Farris, 1988) produced 100 equally parsimonious phylogenetic trees, each with a length of 429 steps, a consistency index of 17, and a retention index of 66. A Nelson consensus tree (length = 492, consistency index = 12, retention index = 85) resulting from the analysis is presented from Figures III-1 to III-2. The phylogenetic relationships and distribution patterns within each group are discussed below, bearing in mind that the paraphyletic species groups are comprised of unrelated clusters of monophyletic subgroups. Numbers for each character in the text below correspond to the numbers on the cladograms and in the character matrix.

#### 4.2.1. The *Phasia argentifrons* species-group

The *Phasia argentifrons* species-group is one of the most strongly supported monophyletic groups in *Phasia* (Figure III-2). High-weight synapomorphies for this group include the strongly projecting lower facial margin [8], rounded or knob-like sublunular bulla [11], and extremely prominent subscutellum [20]. The monophyly of this group is also supported by the long oral opening [13], indistinct hair spots of tergites [28], ventrally bent apex of syncercus [30], slender cercus [31] and the relatively short phallus [36].

The *Phasia argentifrons* species-group includes thirteen species, distributed in the Afrotropical (6 species), Australasian (5 species) and Neotropical (2 species) regions. Phylogenetic relationships within the *Phasia argentifrons* species-group are shown in Figure III-2.

An Australasian species, *Phasia sensua*, appears to be the sister species of the remaining species in the *Phasia argentifrons* species-group. *Phasia sensua* is distributed north to Albany Province, Philippines, and south to New South Wales, Queensland and South Australia (Figure II-2.4).

The *Phasia lepidofera* clade includes *Phasia lepidofera* and *Phasia nigrofimbriata*. This monophyletic group is characterised by the broad cercus [31], short hypandrial apodeme [45] and strongly arched phallapodeme [51]. *Phasia nigrofimbriata* is widespread in

Africa, from Uganda to South Africa as well as Nigeria (Figure II-2.1), but its sister species, *Phasia lepidofera*, is common in Australia, from the southwest coast to the east coast, north to northern Queensland and south to Tasmania (Figure II-1.3).

The *Phasia nasuta* clade consists of six species, *Phasia campbelli*, *Phasia argentifrons*, *Phasia furcata*, *Phasia distincta*, *Phasia brachyptera* and *Phasia nasuta*. This clade is defined on the basis of three characters: the slender surstylus [34], non knob-like ejaculatory apodeme [41] and ventrally bent sternite VII [47]. Within this clade, *Phasia campbelli*, the only New Zealand species, appears to be the basal lineage. *Phasia argentifrons*, an Afrotropical species (Figure II-2.3), and *Phasia furcata*, an Australian species (Figure II-1.4), share one synapomorphic character, a posterior notch on sternite VII [49]. *Phasia brachyptera* plus *Phasia nasuta* form a monophyletic group, defined by yellow basicosta [21] and the almost pointed sternite VII [48]. *Phasia brachyptera* is found in Victoria, Tasmania and probably New South Wales (Figure II-1.4). *Phasia nasuta*, the sister species of *Phasia brachyptera*, is widespread in the Afrotropical region, especially in South Africa (Figure II-2.2). *Phasia distincta* appears to be the sister species of *Phasia brachyptera* + *Phasia nasuta*. *Phasia distincta* is only found in Transvaal, South Africa (Figure II-1.1).

*Phasia jeanneli* plus the *Phasia lepidofera* clade and *Phasia nasuta* clade form an unresolved basal polychotomy (Figure III-2), characterised by the presence of scale-like setae in the male [16], only one pair of marginal scutellar setae [19] and undeveloped pregonite [42]. *Phasia jeanneli* is only known from two female specimens, one from Cape Province, South Africa and another from Kenya (holotype) (Figure II-1.1). *Phasia nigromaculata*, the sister species of the rest of the species in the *Phasia argentifrons* species-group (except *Phasia sensua*) is restricted to Cape Province, South Africa (Figure II-1.1).

Two described Neotropical species, *Phasia capitata* and *Phasia officialis*, belong to the *Phasia argentifrons* species-group. *Phasia capitata* is restricted to Brazil and *Phasia officialis* is known from Argentina, Brazil and Uruguay.

#### 4.2.2. The *Phasia barbifrons* species-group

The monophyly of the *Phasia barbifrons* species-group is supported by one high-weight synapomorphic character (the swollen fronto-orbital plate [3]) and two low-weight synapomorphies (the gena and occiput with black hairs) [10,14]. The group is also diagnosed on the basis of the straight surstylus [33] (Figure III-1, III-2), apparently the result of a reversal from the bent state of the surstylus found in related species groups. The swollen frons is uniquely derived in this group and provides strong evidence for monophyly of the *Phasia barbifrons* species-group. The *Phasia barbifrons* species-group has ten species distributed in the Holarctic region, Australasian region and Central America.

*Phasia frontata*, *Phasia bifurca* and the remaining species of the *Phasia barbifrons* species-group form an unresolved trichotomy. *Phasia frontata* is the only Australian species in *Phasia barbifrons* species-group (Figure II-7.1). *Phasia bifurca* is restricted to Sichuan and Yunnan, China (Figure II-6.3).

The species of the *Phasia barbifrons* species-group exclusive of *Phasia frontata* and *Phasia bifurca* seem to form a monophyletic group on the basis of the presence of parafacial hairs [7]. *Phasia rohdendorfi*, the basal lineage within this clade, is known from high elevations in Nepal, Yunnan, Sichuan and the Russian Far East (Figure II-6.4).

*Phasia barbifrons*, *Phasia malaisei* and *Phasia sichuanensis* are grouped on the basis of the projecting lower facial margin [8], absence of abdominal pruinosity [27] and ventrally bent sternite VII [47], but the species relationships among these three species are not evident. *Phasia barbifrons* has been collected from western Europe, Siberia and the Russian Far East (Figure II-6.4). *Phasia malaisei* is known from a high elevation site in Burma and *Phasia sichuanensis* is from Sichuan, China (Figure II-6.3).

*Phasia serrata*, plus the trichotomy of *Phasia barbifrons* + *Phasia malaisei* + *Phasia sichuanensis*, form a monophyletic group on the basis of the long petiole of the apical cell [23], vein M meeting  $R_{4+5}$  almost at right angle [24], and the broad pregonite apex [43]. This monophyletic group is also diagnosed by two symplesiomorphies [17, 48]. *Phasia serrata* is recorded only from the Philippines (Figure II-7.1).

*Phasia wangi*, the sister species of the *Phasia serrata* + *Phasia barbifrons* + *Phasia malaisei* + *Phasia sichuanensis* clade, is restricted to Sichuan, China (Figure II-6.3).

Two undescribed Central American species in the *Phasia barbifrons* species-group were not included in this analysis.

#### 4.2.3. The *Phasia hemiptera* species-group

The *Phasia hemiptera* species-group includes 20 species from the Holarctic, Oriental and Afrotropical regions. This species-group is paraphyletic (see Figures. III-1, III-2), but is diagnosable by the plesiomorphic state of the fronto-orbital plate (more than 3-4 rows of hairs or entirely haired laterally) [4A2].

An Afrotropical species, *Phasia transvaalensis*, appears to be the sister species of the rest of the species in the genus *Phasia* (Figure III-1). *Phasia transvaalensis* is the only Afrotropical species in the *Phasia hemiptera* species-group (Figure II-1.1).

The *Phasia hemiptera* clade (Figure III-1) consists of an Oriental species, *Phasia godfreyi*, and a Palaearctic species, *Phasia hemiptera*, which share two medium-weight synapomorphies (the strongly pruinose mesonotum [15] and wider frons [2]) and two low-weight derived characters [17, 18]. *Phasia hemiptera* is widespread in the Palaearctic region; and *Phasia godfreyi* is its counterpart in the Oriental region (Figure II-9.4).

*Phasia grazynae*, *Phasia aurigera* and *Phasia albopunctata* are close to the *Phasia chilensis* clade (discussed below) in the *Phasia subcoleoprata* species-group (Figure III-1). *Phasia grazynae* is known only from Fukuoka, Japan (Figure II-10.3). *Phasia aurigera* is found in the western Palaearctic and in the Russian Far East and northeastern China. The isolated record of *Phasia aurigera* from Sichuan possibly reflects a Quaternary refugium. *Phasia albopunctata* is found in southern Siberia, the Russian Far East and Japan, with southernmost records from high elevation areas in Pakistan and Taiwan (Figure II-11.4).



*Phasia grandis* and *Phasia yunnanica* are part of an unresolved polytomy (Figure III-1). *Phasia grandis* is found in the United States, from coast to coast, south to Texas and north to Illinois (Figure II-10.2). *Phasia yunnanica* is known only from Yunnan, China (Figure II-10.3).

*Phasia japonensis* and *Phasia takanoi* are considered to form a monophyletic group (Figure III-1) supported by the following characters: absence of abdominal pruinosity [27], presence of anterior spine-like setae on the female hind tibia [46]. Both species are restricted to the east coast of Asia (Japan and Russia Far East) (Figures II-10.3, II-10.4).

*Phasia diversa* and *Phasia piceipes* form a clade (Figure III-1), characterised by the spherical head [1], perpendicular lower facial margin [8] and the relatively long phallus [36]. Both species occur in the New World. *Phasia piceipes* is known from Mexico, Argentina and Brazil (Figure II-11.2), and *Phasia diversa* is widespread in eastern North America, from Texas to Washington, D.C. (Figure II-10.1).

*Phasia aurulans* and *Phasia zimini* form a polychotomy with the *Phasia diversa* + *Phasia piceipes* clade and one other lineage (see Figure III-1). *Phasia aurulans* is one of the two Holarctic species in *Phasia*. It is distributed across the Palaearctic region, but apparently has a disjunct distribution in North America, occurring only in the eastern and western Nearctic (Figure II-11.1). *Phasia zimini* is known only from the Russian Far East (Figure II-10.3).

The *Phasia obesa* clade includes five species, *Phasia aeneoventris*, *Phasia nigrens*, *Phasia obesa*, *Phasia subopaca*, and *Phasia robertsonii*. This clade appears to be the sister group of the Lineage A (Figure III-1), weakly defined by the relatively long phallapodeme [45], entirely haired fronto-orbital plate [4] and narrow or pointed. pregonite [43]. *Phasia aeneoventris* and *Phasia robertsonii* seem to be sister species. *Phasia aeneoventris* is widespread in the western Nearctic, from Alaska to Mexico. In contrast, *Phasia robertsonii* is restricted to the eastern Nearctic, from New Brunswick to Florida (Figure II-9.2). *Phasia nigrens* is known only from southern Texas and northern Mexico (Figure II-9.3). *Phasia obesa*, the only Palaearctic species in the clade, is widespread from Western Europe to eastern Asia (Figure II-11.3).

#### 4.2.4. The *Phasia pusilla* species-group

The *Phasia pusilla* species-group includes fifteen species from the Australasian, Nearctic, Palaearctic and Oriental regions. This species-group is paraphyletic (Figure III-2), but the *Phasia pusilla* species-group plus the *Phasia argentifrons* species-group form a monophyletic group in which the fronto-orbital plate is bare laterally [4]. This character state is also found in *Phasia minima* + *Phasia sumatrana*, in the *Phasia varicolor* species-group. Other synapomorphies supporting the monophyly of a clade comprised of *Phasia pusilla* + *Phasia argentifrons* species-group include the distinct hair spots [28], bent apex of syncercus [30] and relatively broad surstylus [34].

The phylogenetic position of *Phasia faceta* is uncertain (Figure III-2), as it shares

characters with both the *Phasia argentifrons* species-group and the remaining species of the *Phasia pusilla* species-group. For diagnostic purposes, this species is kept in the *Phasia pusilla* species-group. *Phasia faceta* is known only from northeastern Wau, Papua New Guinea (Figure II-6.2).

The remaining species in the *Phasia pusilla* species-group form a largely unresolved polychotomy, including two recognisable monophyletic groups (Figure III-2).

One monophyletic group, made up of *Phasia emdeni*, *Phasia girschneri*, *Phasia pandellei*, *Phasia truncata*, *Phasia pusilla* and *Phasia punctigera*, is defined by the dorsally bent sternite VII [47], straight syncercus [30] and the broad apex of sternite VII in ventral view [48]. Within this clade, *P. emdeni*, *P. girschneri*, *P. pandellei* and *P. truncata* are grouped by the notched apex of sternite VII in the female [49] and the relatively short phallus [36]. *Phasia girschneri* is known from the type locality (Russia) only (Figure II-4.1). *Phasia emdeni*, *P. pandellei* and *P. truncata* are known from the western Palearctic (Figures II-4.1, II-4.2). *Phasia pusilla* is widespread in the Palearctic region, from southernmost to northern India (Figure II-4.3). *Phasia punctigera* is known from North America, southward to southern Texas and northward to Quebec (Figure II-5.4).

Another group, made up of two Nearctic species, *Phasia purpurascens* and *P. robusta*, is defined by one low weight synapomorphy (phallapodeme longer than hypandrial apodeme [45]) and diagnosed by two symplesiomorphies (surstylus slender, not broadened [34] and pregonite narrow or pointed [43]). *Phasia robusta* occurs in western North America, northward to Alberta and south to Big Bend in Texas (Figure II-5.2). *Phasia purpurascens* is widespread in the eastern and southwestern Nearctic but is disjunct across the mid-western Nearctic (Figure II-5.3).

*Phasia normalis* is placed in the *Phasia pusilla* species-group on the basis of the bare fronto-orbital plate laterally [4A2] and divergent frons [6]. *Phasia normalis* is known from Queensland and New South Wales (Figure II-3.3). *Phasia venturii*, the western Palearctic species, is part of an unresolved trichotomy with *Phasia normalis* plus the *Phasia argentifrons* species-group (Figure III-2). *Phasia venturii* is known from western Europe and northern Africa (Figure II-5.1).

Relationships of the other four species in the *Phasia pusilla* species-group, *Phasia aldrichii*, *Phasia indica*, *Phasia mesnili* and *Phasia siberica*, are not resolved. *Phasia aldrichii* is Holarctic, distributed across the entire Palearctic and Nearctic regions (Figure II-4.4). *Phasia indica* is only found in northern India. *Phasia mesnili* is widespread in the southwestern Palearctic and Middle East (Figure II-6.1). *Phasia siberica* is known from the type locality, southern Siberia (Figure II-5.1).

#### 4.2.5. The *Phasia subcoleoprata* species-group

The *Phasia subcoleoprata* species-group is paraphyletic (see Figures III-1), but can be diagnosed by the 1-3 rows of distinct hairs on the fronto-orbital plate laterally [4A1] (this character is also found in several species of the *Phasia varicolor* species-group, but *Phasia*

*subcoleoprata* species have enlarged dorsal eye facets [5A]). Within the *Phasia subcoleoprata* species-group, phylogenetic relationships of most species are poorly resolved because of the many homoplasies and character reversals involved (Figures III-1, III-2).

Two Nearctic species, *Phasia albipennis* and *Phasia fenestrata*, are sister species (Figure III-1) and share two synapomorphies, the strongly pruinose mesonotum (especially in males) [15] and relatively long phallapodeme [45] as well as two symplesiomorphies [14, 43]. *Phasia fenestrata* is common in the eastern Nearctic, with records from Alberta and Northwest Territories, but its sister species, *Phasia albipennis*, is known only from the western Nearctic, north to Alaska (Figure II-7.2). *Phasia subcoleoprata* and *Phasia hippobosca* are related to the *Phasia albipennis* + *Phasia fenestrata* clade (Figure III-1). *Phasia subcoleoprata* is widespread in the western Palaearctic region (Figure II-9.1). *Phasia hippobosca* is known from eastern and southeastern Australia (Figure II-8.2).

The *Phasia chilensis* clade includes twelve species (Figure III-1), defined by the 1-3 rows of hairs on the fronto-orbital plate [4A1]. *Phasia rufiventris*, the widespread Australian species (Figure II-8.2), is the sister species of the remaining species in this clade.

Within the *Phasia chilensis* clade, two Afrotropical species, *Phasia clavigralla* and *Phasia nasalis* share one synapomorphy (spherical head [1]) and one symplesiomorphy (sternite VII not pointed [48]). *Phasia australiensis*, the Australian species, and *Phasia cana*, the African species, are related and share one character (vein M meeting  $R_{4+5}$  at acute angle [24]). These four species plus *Phasia multisetosa* (the African species) form a monophyletic group on the basis of four characters [23, 31, 33, 41].

The species relationships of the *Phasia africana*, *Phasia chilensis*, *Phasia lauta*, *Phasia malayana*, *Phasia singuliseta* and *Phasia subnitida* are not resolved (Figure III-1). *Phasia chilensis* is the most widespread New World species in the genus *Phasia*, and has been recorded from northern California to Indiana, Maryland and Mexico, Venezuela, Uruguay (Montevideo), Peru (Lima) and Chile (Panquehue) (Figure II-7.3). *Phasia lauta*, *Phasia malayana* and *Phasia singuliseta*, from the Oriental region, are known from only a few specimens (Figure II-8.1). *Phasia africana* and *Phasia subnitida* are known from the Afrotropical region (Figure II-7.4).

*Phasia woodi*, an Australasian species distributed from eastern Australia to Taiwan and Thailand (Figure II-8.4), and *Phasia noskiewiczzi*, known from the type locality, Uzbekistan (Figure II-5.1) are not closely related to other members of the *Phasia subcoleoprata* species-group (Figure III-1, III-2). They are included in this group for diagnostic purposes.

#### 4.2.6. The *Phasia varicolor* species-group

The *Phasia varicolor* species-group includes 8 species from the Afrotropical, Oriental, Australian regions, including all the species previously placed in *Besserioides* Curran (*sensu* Crosskey 1976). The *Phasia varicolor* species-group is monophyletic and sup-

ported by a high weight synapomorphy: the inner side of eyes parallel or nearly so [6] (as in Figure I-29.2), and a median weight synapomorphy: the first flagellomere usually longer than 2.0 times pedicel length or over half of facial height [12] (as in Figure I-66.1) (reversed in *Phasia sumatrana*). This species-group is also diagnosed by the small dorsal facets of eye.

The phylogenetic relationships within the *Phasia varicolor* species-group are not fully understood because of missing data, but preliminary results suggest that *Phasia rotundata*, *Phasia triangulata* plus *Phasia varicolor* form a monophyletic group (Figure III-2), characterised by the occiput with white hairs only [14] and the haired phallus [35]. Within this clade, two new species, *Phasia rotundata* and *Phasia triangulata*, are sister species that share the following characters: straight sternite VII [47], unbranched distiphallus [38] and long phallus [36]. *Phasia rotundata* is known from South Australia and New South Wales. *Phasia triangulata* is found only in Sri Lanka and northern India. *Phasia varicolor* has a disjunct distribution in eastern Australia and India (Figure II-3.1).

*Phasia minima* plus *Phasia sumatrana*, the sister group of the *Phasia rotundata* + *Phasia triangulata* + *Phasia varicolor* clade, form another monophyletic group in the *Phasia varicolor* species-group. Species in this clade share a laterally bare fronto-orbital plate [4], extremely narrow parafacial [9], bent sternite VII [47] and two other characters [22, 48] (Figure III-2). *Phasia sumatrana* is known from the type locality, Sumatra, Indonesia. *Phasia minima*, the sister species of *Phasia sumatrana*, is distributed in Wau and New Britain in Papua New Guinea (Figure II-3.2).

The *Phasia latifrons* clade includes *Phasia latifrons* and *Phasia cylindrata*, characterised by distinct hair spots on tergites IV and V [28], relatively short phallus [36], a pointed or narrow distiphallus [40], and an even pregonite apex [42] (Figure III-2). *Phasia cylindrata* is known only from Papua New Guinea (Figure II-3.3). The other species, *Phasia latifrons* is found in Capital Territory, Australia (Figure II-3.2).

An Afrotropical species, *Phasia mathisi*, is the sister species of the remaining species (except the *Phasia latifrons* clade) in the *Phasia varicolor* species-group (Figure III-2). *Phasia mathisi* is known only from Kenya and Seychelles (Figure II-3.4).

### 4.3. Biogeography of *Phasia*

Estimates of the time of origin of the genus *Phasia* are impeded by the lack of fossil evidence, but the Upper Cretaceous fossils that were assigned to the Calliphoridae by McAlpine (1970) provide a minimum age for the Calyptratae. Hennig (1981) thought the Calyptratae couldn't have arisen any later than the Jurassic. Papavero (1977) also argued for an early age of origin for the calyptrates, postulating that oestrids appeared in the supercontinent of Pangaea during the Upper Jurassic or Lower Cretaceous.

The *Phasia pusilla* species-group is mainly Laurasian. *Phasia pusilla* is widespread in the Palearctic region, and the record from northern India reflects dispersal from Eurasia after the Indian subcontinent collided with Eurasia (55-53 million years ago). In Eurasia, the Scandinavian ice sheet spread south as far as latitude 48°N during the Quaternary, but the Mediterranean area was probably a glacial refuge for many species in the *Phasia pusilla* species-group (including *Phasia emdeni*, *Phasia girschneri*, *Phasia mesnili*, *Phasia venturii*, *Phasia pandellei* and *Phasia truncata*). The origin of the Holarctic species *Phasia aldrichii* is unknown, but the wide distribution of this species reflects that of its hosts. Until the relationships of *Phasia mesnili*, *Phasia siberica* and *Phasia indica* are further resolved, it can only be assumed that the ancestor of these species originated in the Palearctic region. *Phasia curvipes* is the only Neotropical member in the *Phasia pusilla* species-group. The ancestor of this species probably dispersed from the Nearctic during the Pliocene biotic interchange between South America and North America.

The *Phasia argentifrons* species-group is restricted to the Southern Hemisphere, where most species are found at lower elevations or lower latitudes. The *Phasia argentifrons* species-group is most diverse in the Old World south of the ancient Tethys Sea, i.e., South Africa, southeastern Asia and Australasia. Brundin (1966) proposed that the lineage splits of some groups of Nematocera (Chironomidae: Podonominae and Diamesinae) resulted from the fragmentation of Gondwana. Although the Tachinidae must be a much younger group than the Chironomidae, current disjunctions within the *Phasia argentifrons* species-group also appear to reflect ancient Gondwanian ranges fragmented since the early Cretaceous. This interpretation is also supported by the current distribution patterns of the *Phasia varicolor* species-group (discussed below).

One problem with this vicariance explanation is that connections between Africa and Australia were supposedly severed much earlier than those between Australia and New Zealand. The closer relationship between Australian and African *Phasia* species than between New Zealand and Australian species conflicts with this history, and calls for an alternate explanation. This call is repeated in another clade (*lepidofera+nigrofimbriata*), which again shows closest relationships between Australia and Africa. If dispersal gave rise to the current distribution patterns, the *Phasia argentifrons* species-group ought to be expected in Saudi Arabia and the Indian subcontinent, however, this species-group appears to be absent from these intervening landmasses. The data presented here do not lead themselves to a dispersalist explanation of the above disjunctions. Distributional patterns in the *Phasia argentifrons* species-group therefore either reflect faunal connections between parts of Australia and Africa that are closer than the faunal connections between New Zealand and Australia, or they reflect an error or missing data in the analysis. Perhaps a species in this group remains undiscovered in New Zealand, and its discovery and placement in the phylogeny will provide a test for the above hypotheses.

Connections between Australia and southeastern Asia are more easily explained by dispersal, and the distribution of one species in the *Phasia argentifrons* species-group (*Phasia sensua*) is a case in point. During Miocene times, the present eastern Philippines coast may have been a continuous, elongated island connecting Luzon, the Visayans, and Mindanas with Sulawesi (Morain 1984). *Phasia sensua*, an Australasian species, appears to have dispersed along this bridge.

The *Phasia barbifrons* species-group occurs mainly in the Palaearctic region and high elevations in the Oriental region, with the highest diversity in eastern Eurasia where the group probably originated. *Phasia barbifrons* and *Phasia rohdendorfi* have disjunct populations on high mountains in tropical or subtropical areas (Figure II-6.4), suggesting that these species were more widespread during the Pleistocene. In the Philippines, the lizard fauna, insect (Lepidoptera) fauna, and upland flora of Mountain Province in Luzon, suggest an early direct connection with Taiwan and the Asian continent (Morain 1984). This pattern seems reflected in *Phasia serrata*, a member of the *Phasia barbifrons* species-group, which is found in the high mountains (900-1,000m) in Luzon and on Mt. Talinas in the Philippines.

Two undescribed New World species in the primarily Asian *Phasia barbifrons* species-group have their closest relatives in Asia, suggesting that the ancestors of the New World species dispersed from Asia to America via the Bering land bridge during the Pleistocene, then dispersed southward to Central America.

The *Phasia varicolor* species-group is most diverse in subtropical or tropical areas. Its members have been recorded from western Africa, and the Oriental, Neotropical and Australian regions. This species-group may have a biogeographic history similar to that of the *Phasia argentifrons* species-group. *Phasia minima* is the Papuan element in the *varicolor* group. Its sister species, *Phasia sumatrana* invaded Sumatra, Indonesia during the Tertiary. *Phasia varicolor* and its close relatives *Phasia rotundata* and *Phasia triangulata*, recorded from Sri Lanka, India, eastern Australia, and South Australia (Figure II-3.1), probably have a common Gondwanian origin. Similar distribution patterns are also found in the genus *Heteropsilopus* Bigot (Diptera, Dolichopodidae) (Bickel 1994). The origins of *Phasia mathisi* and *Phasia pomeryi*, the African members in the *Phasia varicolor* species-group, are still not clear.

The *Phasia subcoleoprata* species-group is widespread and paraphyletic, but some monophyletic subgroups show interesting distribution patterns. Two distinct distribution patterns, Gondwanan and Laurasian, are recognized on the basis of current distribution data.

Relationships between *Phasia hippobosca*, *Phasia albipennis*, *Phasia fenestrata* and *Phasia subcoleoprata* in the *Phasia subcoleoprata* species-group are not well resolved (Figure III-1), but these similar species could be closely related, and may have common origins in the northern hemisphere. The lineage was probably split during the Eocene (40 million years ago) when the Europe-North America land bridge was broken, with the *Pha-*

*Phasia subcoleoprata* lineage surviving in the western Palaearctic and the *albipennis* + *fenestrata* clade in the Nearctic region. Within the Nearctic region, the *Phasia albipennis* + *Phasia fenestrata* clade has an east-west vicariance pattern similar to that found in the *Phasia aeneoventris* + *Phasia robertsonii* pair of the *Phasia hemiptera* species-group.

The *Phasia chilensis* clade (Figure III-1) in the *Phasia subcoleoprata* species-group is mostly a southern hemisphere group. Six species are restricted to Africa, particularly eastern Africa (Figures II-7.4, II-8.3). Two species (*Phasia australiensis* and *Phasia rufiventris*) are only found in Australia. The Oriental species *Phasia malayana* and *Phasia lauta* are each known from only single specimens. Since all related species are found in Gondwana, *Phasia chilensis*, the New World species, probably originated in the Andean region and invaded North America during the late Pliocene.

The *Phasia hemiptera* species-group is diverse in the Palaearctic, Nearctic and Neotropical regions but does not occur in Australia. A few species are found in the Oriental region but are restricted to northern areas or high elevations. For example, *Phasia yunnanica* is known from Yunnan, China (3,000m) and *Phasia godfreyi*, a sister species of *Phasia hemiptera*, is recorded from Laos. In the Afrotropical region, the *Phasia hemiptera* species-group is known only from a single specimen of *Phasia transvaalensis*.

The *Phasia hemiptera* species-group appears to be paraphyletic, but dispersal through the Bering land bridge and Europe-North America land bridge during the early Tertiary probably resulted in frequent interchanges between Palaearctic and Nearctic elements. It is doubtful that the diversity of the Neotropical species can be entirely accounted for by immigrations since the Pliocene, but those widespread New World species (i.e. *Phasia aeneoventris*) and present day *Phasia* sister species or sister group pairs shared between Central and South America are evidence of dispersal between North America and South America.

The clade *Phasia nigrens* + *Phasia obesa* + *Phasia subopaca* + *Phasia aeneoventris* + *Phasia robertsonii* in the *Phasia hemiptera* species-group (Figure III-1) is mainly distributed in North America except for a widespread Palaearctic species (*Phasia obesa*). An east-west pattern of vicariance is seen in the *Phasia aeneoventris* and *Phasia robertsonii* pair (Figure II-9.2). The two species are morphologically similar, which suggests a relatively recent divergence. The ancestral species was probably split by Pleistocene glacial events, with *Phasia aeneoventris* surviving in a western refugium either in Beringia or south of the glaciated area, and *Phasia robertsonii* surviving in an eastern refugium. Other species in this clade also support the above east-west vicariance pattern, with the west vicar, *Phasia nigrens*, becoming adapted to more arid regions, and the east vicar, *Phasia subopaca*, to a much wetter habitat.

### Summary of the biogeography of *Phasia*

(1). It is hypothesized that *Phasia* originated during the early Cretaceous because of the

Gondwanian distributions of the *Phasia argentifrons* species-group, the *Phasia varicolor* species-group, and the *Phasia chilensis* clade in the *Phasia subcoleoptrata* species-group. (2). The *Phasia barbifrons* species-group is assumed to have originated in eastern Eurasia because the basal lineages occur there. (3). The distribution patterns of the sister species pairs *Phasia aeneoventris*+*Phasia robertsonii* and *Phasia albipennis* + *Phasia fenestrata* suggest east-west vicariance of wide-spread Nearctic ancestors.

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TABLE 1. Character Matrix for *Phasia*.

	00000	00001	11111	11112	22222	22223	33333	33334	44444	44445	5
	12345	67890	12345	67890	12345	67890	12345	67890	12345	67890	1
ANCESTOR	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	0
<i>aeneoventris</i>	12001	00100	00010	01000	1x110	10100	01000	01000	00000	10100	0
<i>africana</i>	xx011	00000	00000	00000	0x110	100xx	xxxxx	xxxxx	xxxxx	12000	x
<i>albipennis</i>	02011	01000	00001	01000	01000	10011	11000	11000	00001	02000	0
<i>albopunctata</i>	11001	00000	00000	00000	00000	10000	11111	11111	10000	01100	0
<i>aldrichii</i>	11021	00101	00010	01000	11110	10110	01010	00000	00100	10100	0
<i>argentifrons</i>	02021	00200	10101	10011	10010	1x011	11001	11000	11101	12010	0
<i>aurigera</i>	02001	00000	00001	00000	10000	00010	11111	00111	10001	01100	0
<i>aurulans</i>	02001	00100	00011	01000	00000	00011	11000	01000	11100	02001	0
<i>australiensis</i>	xx011	00100	00100	00000	1x000	100xx	xxxxx	xxxxx	xxxxx	11100	0
<i>barbifrons</i>	11101	01101	00010	00000	11110	10001	11010	01000	01100	02001	0
<i>bifurca</i>	02101	01101	01010	01000	10000	10010	11011	11000	00000	01100	0
<i>brachyptera</i>	01021	00200	10110	11011	00010	01011	01001	11001	10100	xxxxx	0
<i>campbelli</i>	01021	00200	10100	10011	10110	11101	11000	10000	11101	12001	0
<i>cana</i>	xx011	00100	00000	00000	1x100	000xx	xxxxx	xxxxx	xxxxx	11100	x
<i>chilensis</i>	11011	00000	00001	00000	0x010	10011	11111	10010	00000	11100	0
<i>clavigralla</i>	xx011	00100	00000	00000	1x010	100xx	xxxxx	xxxxx	xxxxx	10000	x
<i>cylindrata</i>	12010	10101	01001	00000	10111	10111	11001	11001	01101	10100	0
<i>distincta</i>	01021	00200	10100	10011	10110	10010	11001	11000	11100	xxxxx	0
<i>diversa</i>	12001	00000	00010	01000	00110	10011	11001	01000	11100	00000	0
<i>emdeni</i>	xx021	00101	00110	01000	1x110	101xx	xxxxx	xxxxx	xxxxx	11010	x
<i>faceta</i>	xx021	00011	00010	00000	1x110	010xx	xxxxx	xxxxx	xxxxx	10100	x
<i>fenestrata</i>	02011	00100	00001	01000	0x100	00011	11000	11000	00001	02000	0
<i>frontata</i>	xx111	00111	00010	00000	1x110	110xx	xxxxx	xxxxx	xxxxx	10100	x
<i>furcata</i>	xx021	00200	10110	x0011	1x110	110xx	xxxxx	xxxxx	xxxxx	02010	x
<i>girschneri</i>	xx021	00100	001x0	0x000	xx110	1xxxx	xxxxx	xxxxx	xxxxx	x1010	x
<i>godfreyi</i>	02001	00000	00001	01100	10000	00000	01000	01000	00001	xxxxx	0
<i>grandis</i>	10001	00000	00000	00000	00000	10010	01111	01000	00000	11100	0
<i>grazynae</i>	01001	00000	00000	00000	10000	00x01	11110	11100	x0000	x1100	0
<i>hemiptera</i>	02001	01000	00001	01100	10000	00000	01000	01000	01101	10100	0
<i>hippobosca</i>	02011	00100	00110	01000	10110	11010	10000	10000	00101	02000	0
<i>indica</i>	12021	00100	00010	01000	11110	10111	11110	00000	00000	10000	0
<i>japanensis</i>	02001	00100	00010	01000	10000	01011	11110	01000	10100	10000	0
<i>jeanneli</i>	xx021	00200	10100	x0011	1x110	100xx	xxxxx	xxxxx	xxxxx	10000	x
<i>kudoii</i>	01001	01100	00010	01000	00000	10010	11111	00000	00101	02001	0
<i>latifrons</i>	02010	10111	01010	01000	11110	00110	11011	01001	01100	xxxxx	0
<i>lauta</i>	01011	00000	00000	01100	01110	11001	11110	00010	11101	xxxxx	0
<i>lepidofera</i>	11021	00200	10100	10011	11110	10011	01010	01000	01100	12000	1
<i>malaisei</i>	xx101	01101	00010	00000	1x110	110xx	xxxxx	xxxxx	xxxxx	00000	x
<i>malayana</i>	01011	00000	00010	00100	10110	00001	11011	10001	10001	xxxxx	0
<i>mathisi</i>	xx010	10001	01010	00000	1x110	110xx	xxxxx	xxxxx	xxxxx	01000	x
<i>mesnili</i>	12021	00100	00010	01000	11110	10111	11000	01000	00100	10100	0

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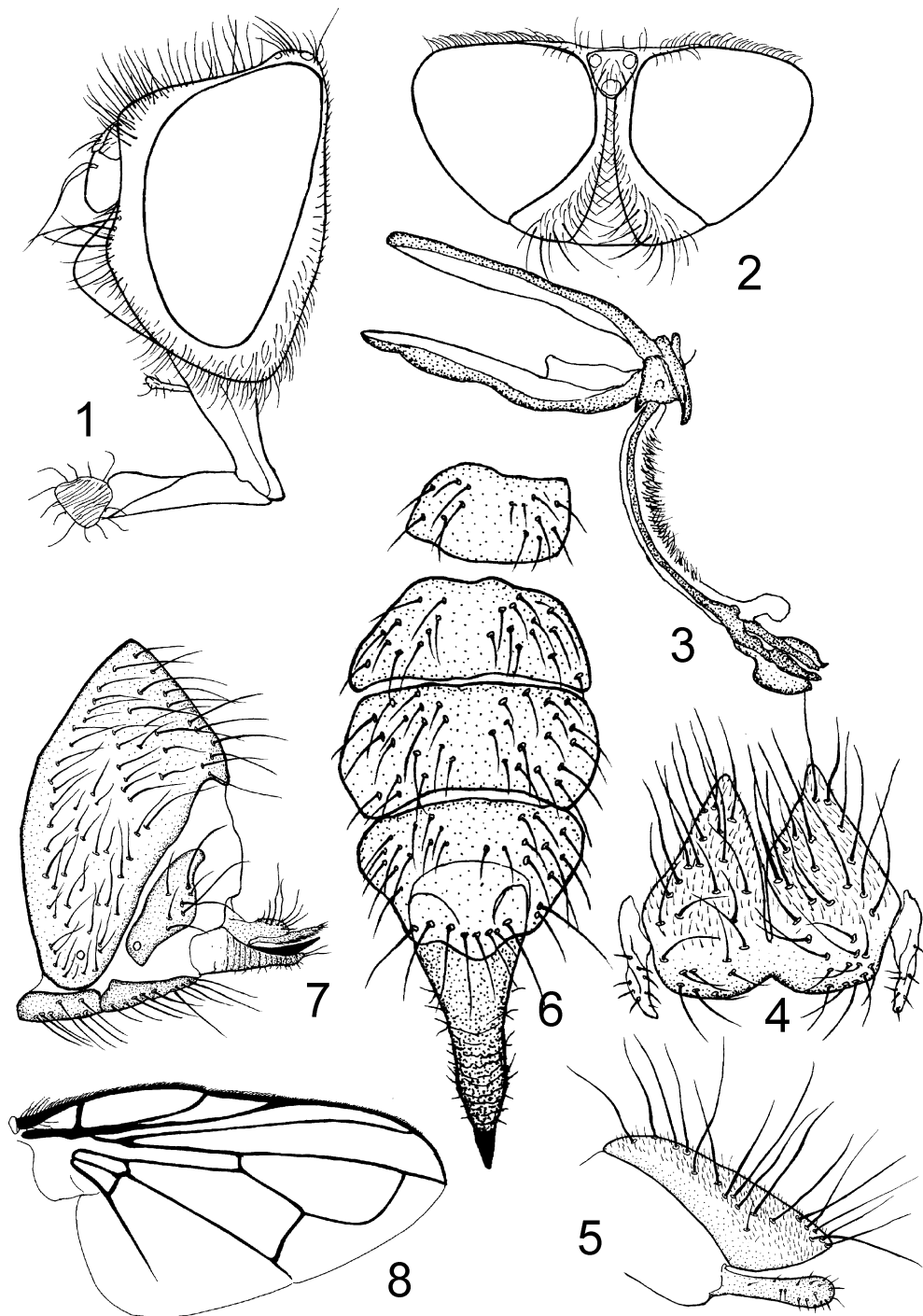
TABLE 1 (continued)

	00000	00001	11111	11112	22222	22223	33333	33334	44444	44445	5
	12345	67890	12345	67890	12345	67890	12345	67890	12345	67890	1
<i>minima</i>	12020	10111	01010	00000	10110	01001	10001	10110	00101	02000	0
<i>multisetosa</i>	01011	00100	00000	00100	00010	01000	11010	00010	01100	01100	0
<i>nasalis</i>	11011	00100	00000	00000	10010	00001	11000	00010	11001	12000	0
<i>nasuta</i>	10021	00200	10100	10001	01110	10011	11001	11010	11100	12100	1
<i>nigrens</i>	12001	00100	00010	01000	10110	11000	11000	11000	00001	10001	0
<i>nigrofimbriata</i>	01021	00200	10110	10011	10110	10111	01011	11001	01100	00000	1
<i>nigromaculata</i>	xx021	00200	10100	x0001	1x110	100xx	xxxxx	xxxxx	xxxxx	10000	x
<i>normalis</i>	11020	00100	00000	01000	11110	10110	00110	01010	00101	10100	0
<i>noskiewiczi</i>	xx011	00100	00010	0x000	xx110	10xxx	xxxxx	xxxxx	xxxxx	12000	x
<i>obesa</i>	11001	00100	00001	01000	1x010	10010	11000	01000	00001	10000	0
<i>pandellei</i>	12021	00100	00010	01000	11110	10110	11010	11000	00110	11010	0
<i>piceipes</i>	12001	00000	00001	01000	01000	10011	11000	01000	10100	12000	0
<i>punctigera</i>	11021	00100	00010	01000	11110	10110	11001	00000	01110	02000	0
<i>purpurascens</i>	12021	00100	00010	01000	11110	10111	11000	01000	00001	10100	0
<i>pusilla</i>	12021	00101	00010	01000	11110	10110	11010	11000	00100	12000	0
<i>robertsonii</i>	12001	00100	00010	01000	1x110	10000	01000	01000	00000	10100	0
<i>robusta</i>	12021	00100	00010	01000	11100	10111	11000	01000	00001	10100	0
<i>rohdendorfi</i>	01101	01001	00010	01000	10000	10010	11011	01000	00000	01100	0
<i>rotundata</i>	12010	10101	01000	00000	11110	01000	10000	00000	00101	00100	0
<i>rufiventris</i>	01011	00100	00001	00000	0x010	00000	11111	11110	00110	01100	0
<i>sensua</i>	10021	00200	10110	01001	11110	10011	11110	00000	00101	11100	0
<i>serrata</i>	11101	01001	00011	00000	10110	10000	11000	01000	00101	xxxxx	0
<i>siberica</i>	xx021	00100	00010	01000	1x110	100xx	xxxxx	xxxxx	xxxxx	10100	x
<i>sichuanensis</i>	xx101	01101	00010	01000	1x110	110xx	xxxxx	xxxxx	xxxxx	02000	x
<i>singuliseta</i>	11011	00100	00000	00000	01110	00010	01110	00110	11101	00100	0
<i>subcoleoptrata</i>	02011	00100	00001	01000	00100	00011	11000	01000	01100	02000	0
<i>subnitida</i>	01011	00100	00001	00100	10110	00001	01110	00010	11100	xxxxx	0
<i>subopaca</i>	12001	00100	00010	01000	10110	10000	10000	01000	10001	10100	0
<i>sumatrana</i>	xx020	10111	00010	00000	1x100	010xx	xxxxx	xxxxx	xxxxx	02000	x
<i>takanoi</i>	02001	01100	00000	00000	00010	11010	11110	11000	10100	11100	0
<i>transvaalensis</i>	02001	00000	00000	00000	10000	00011	01000	00010	11101	xxxxx	0
<i>triangulata</i>	12010	10101	00000	00000	01110	01000	11000	00010	01101	00100	0
<i>truncata</i>	12021	00100	00010	01000	11110	10110	11011	11010	00100	01010	0
<i>varicolor</i>	12010	10101	01000	00000	11000	01010	10010	11110	11100	01100	0
<i>venturii</i>	10021	00100	00011	01000	11110	11110	01011	11000	11001	10100	0
<i>wangi</i>	xx101	01001	00010	01000	1x000	110xx	xxxxx	xxxxx	xxxxx	11100	x
<i>woodi</i>	10011	00101	00010	00000	11110	10010	11001	11001	00000	01100	0
<i>yunnanica</i>	01001	00100	00000	01000	10000	00010	11111	11011	00000	xxxxx	0
<i>zimini</i>	02001	00100	000x0	00000	10000	0001x	10000	11000	x0000	x2000	0

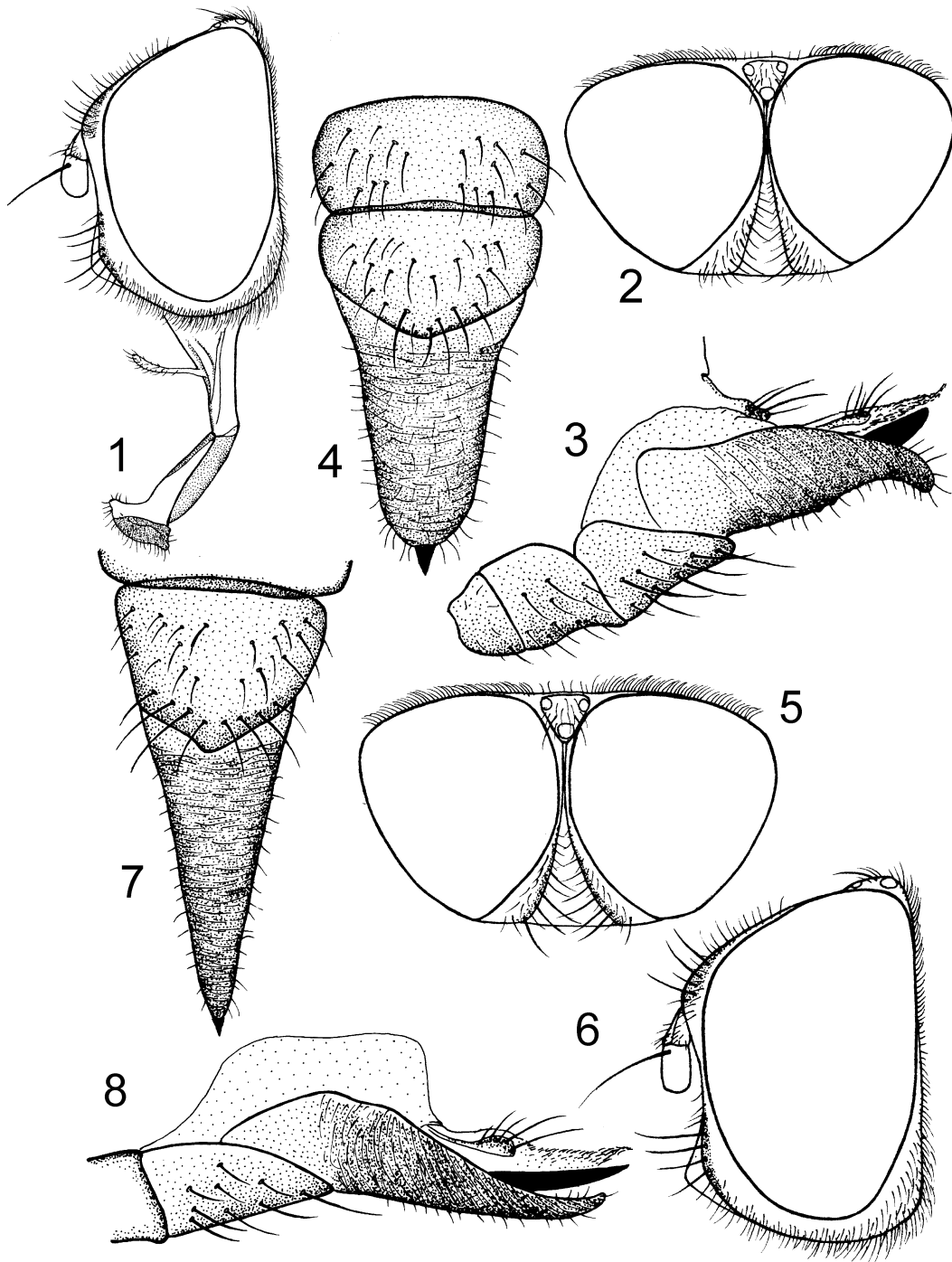
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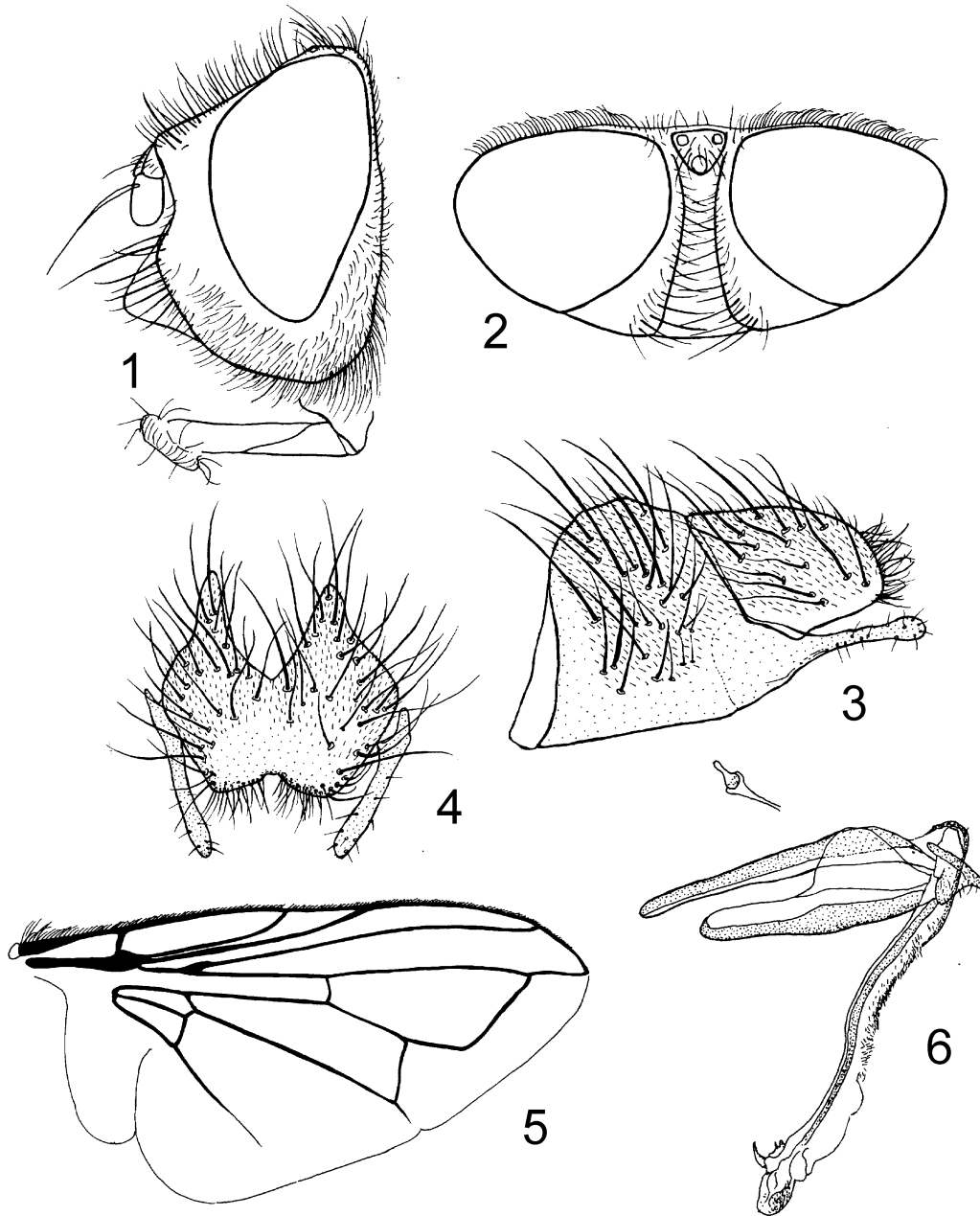
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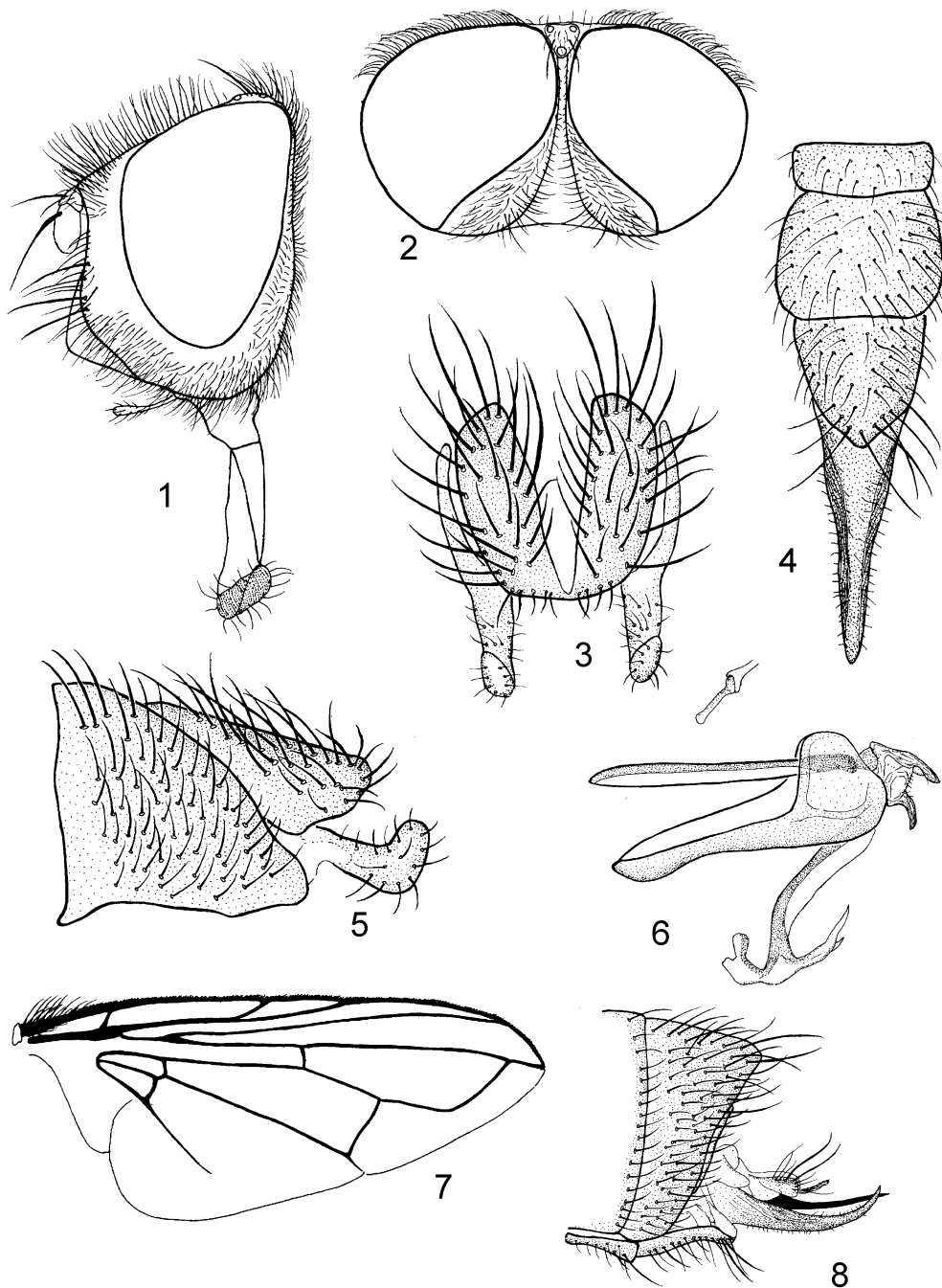
**FIGURE I-1.** *Phasia aeneoventris* (Williston) (Canada): 1. head profile ( $\sigma$ , AB); 2. dorsal view of head ( $\sigma$ , AB); 3. lateral view of male hypandrium complex (BC); 4. posterior view of male terminalia (BC); 5. lateral view of male terminalia (BC); 6. ventral view of female terminalia (BC); 7. lateral view of female terminalia (BC); 8. wing ( $\sigma$ , AB).



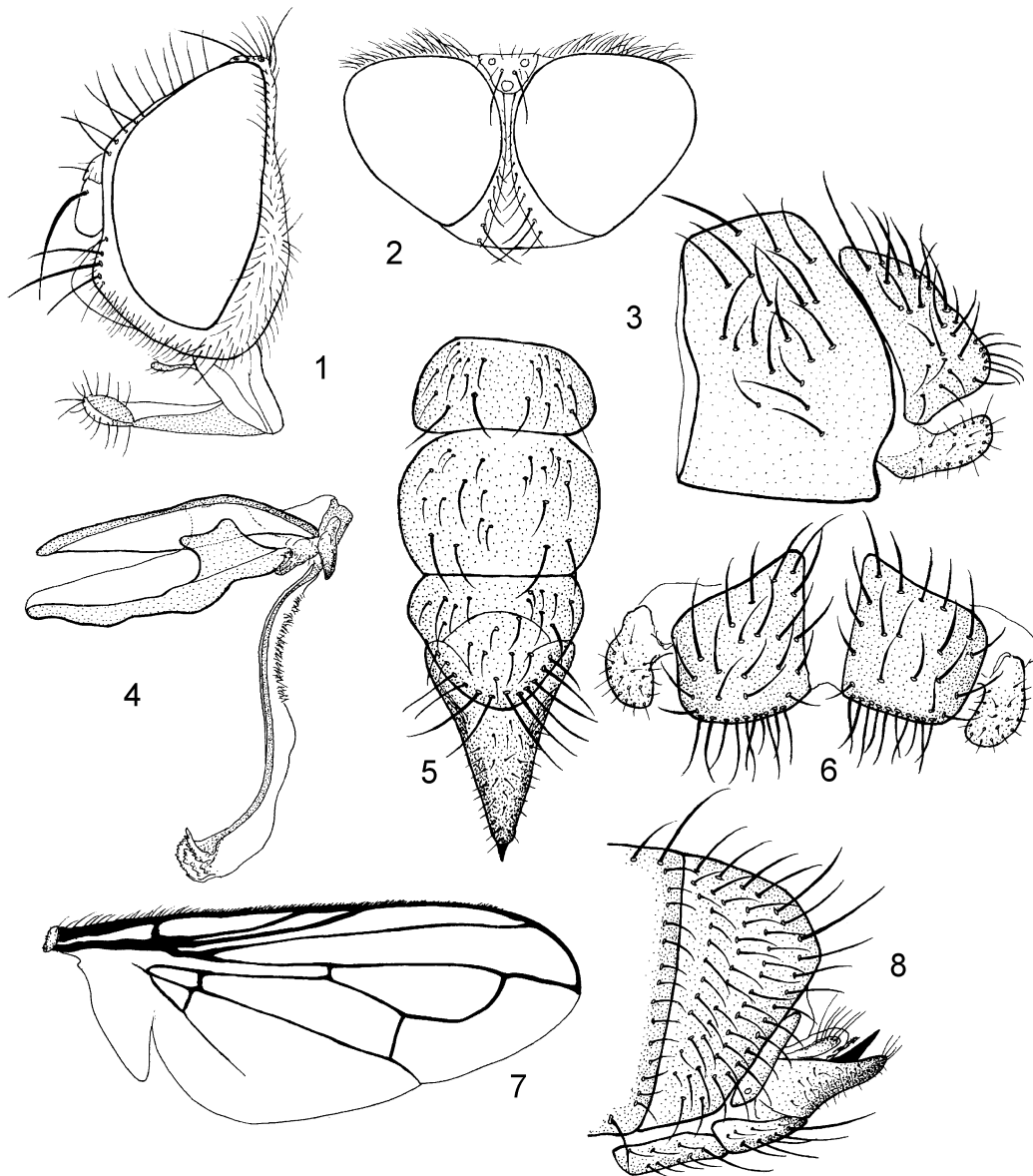
**FIGURE I-2.** 1-4. *Phasia africana* Sun (South Africa): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia. 5-8. *Phasia cana* Sun (South Africa): 5. dorsal view of head (♀); 6. head profile (♀); 7. ventral view of female terminalia. 8. lateral view of female terminalia.



**FIGURE I-3.** *Phasia albipennis* (Brooks) (USA): 1. head profile ( $\sigma$ , ID); 2. dorsal view of head ( $\sigma$ , ID); 3. lateral view of male terminalia (ID); 4. posterior view of male terminalia (ID); 5. wing ( $\sigma$ , ID); 6. lateral view of male hypandrium complex (ID).

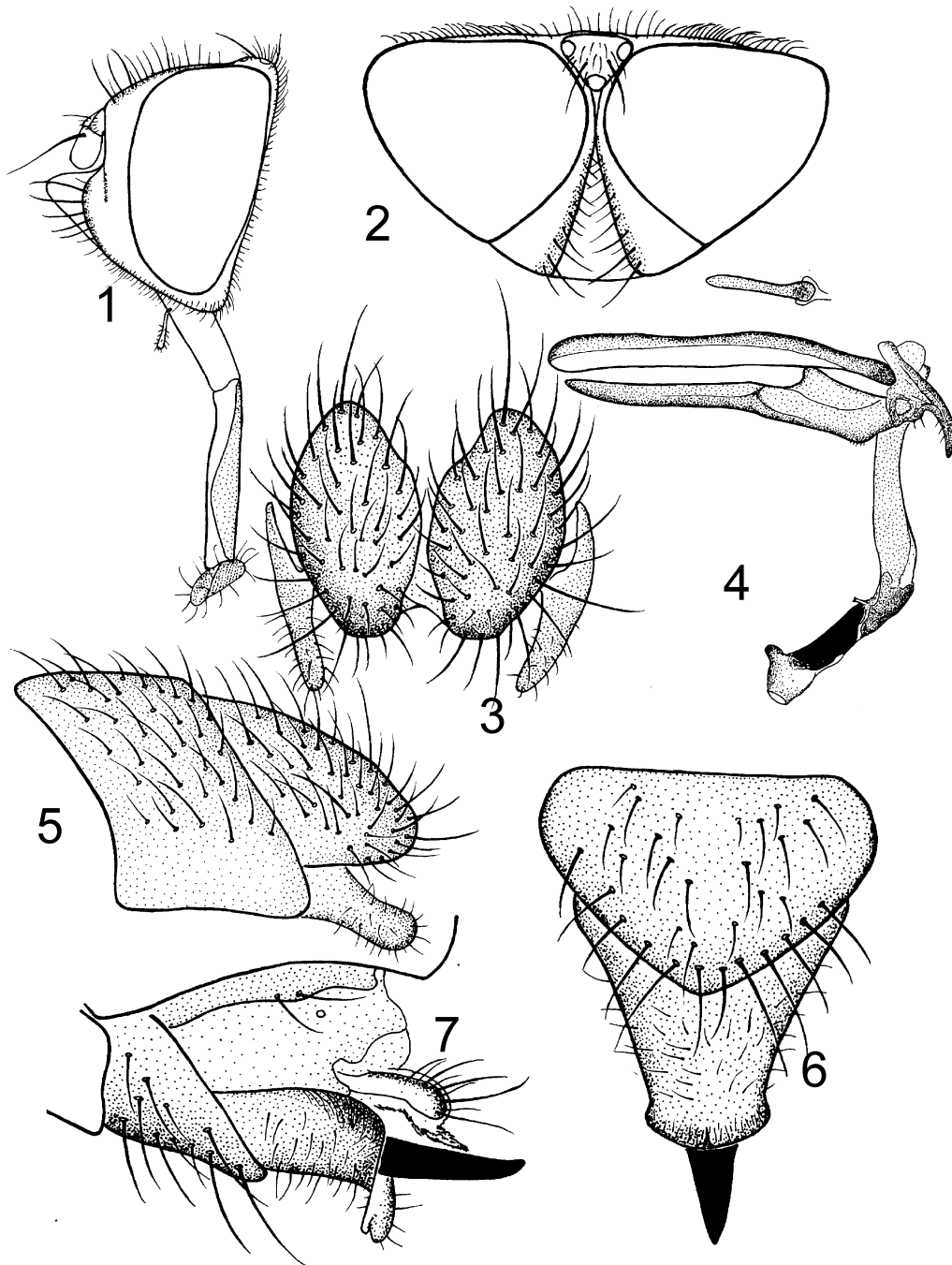


**FIGURE I-4.** *Phasia albopunctata* (Baranov): 1. head profile (♂, Japan); 2. dorsal view of head (♂, Japan); 3. posterior view of male terminalia (Japan); 4. ventral view of female terminalia (Pakistan). 5. lateral view of male terminalia (Japan); 6. lateral view of male hypandrium complex (Pakistan); 7 wing (♂, Japan); 8. lateral view of female terminalia (Pakistan).

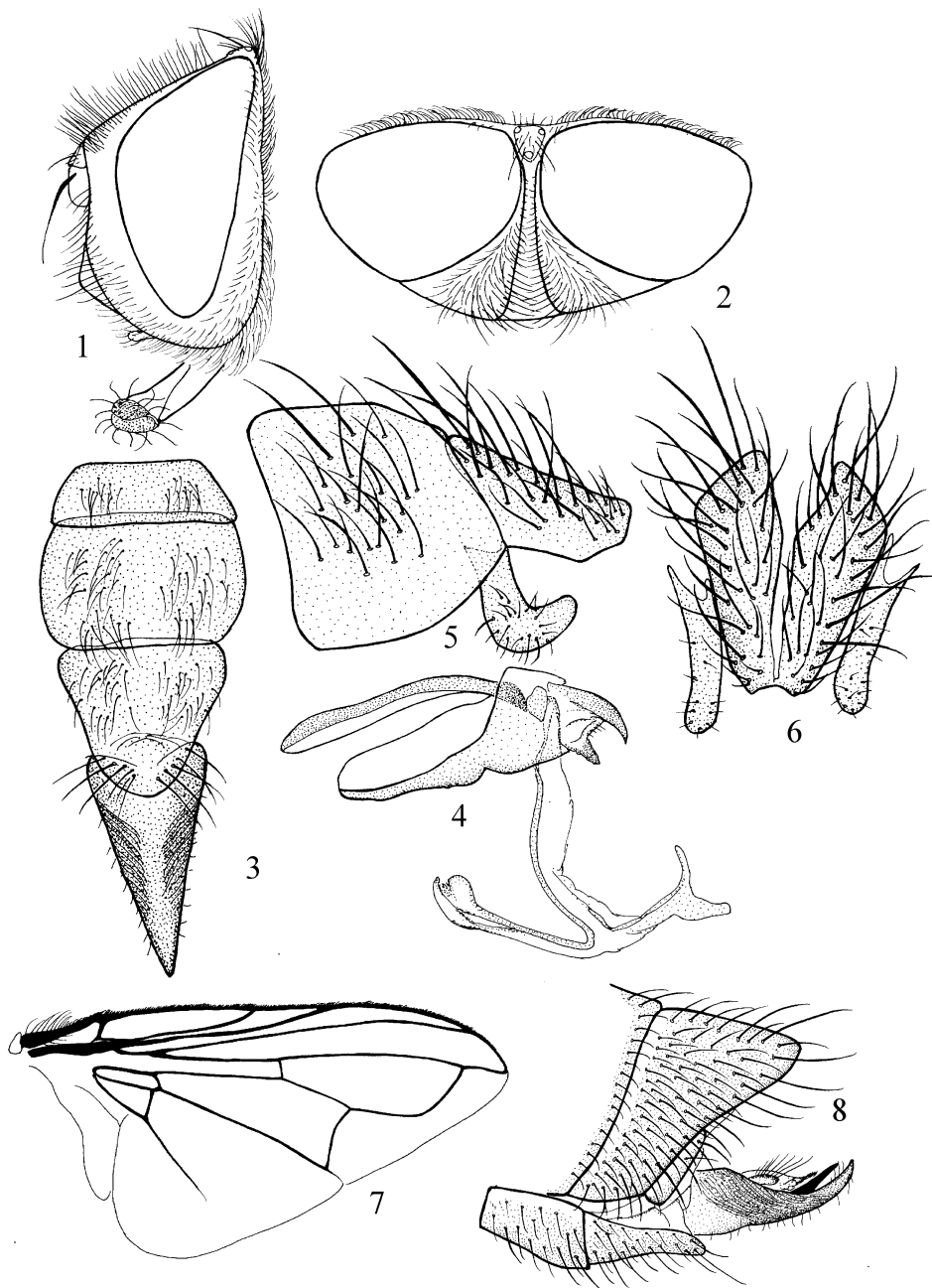


**FIGURE I-5.** *Phasia aldrichii* (Townsend) (USA): 1. head profile (♀, WY); 2. dorsal view of head (♀, WY); 3. lateral view of male terminalia (MT); 4. lateral view of male hypandrium complex (MT); 5. ventral view of female terminalia (MT); 6. posterior view of male terminalia (MT); 7. wing (♀, WY); 8. lateral view of female terminalia (MT).

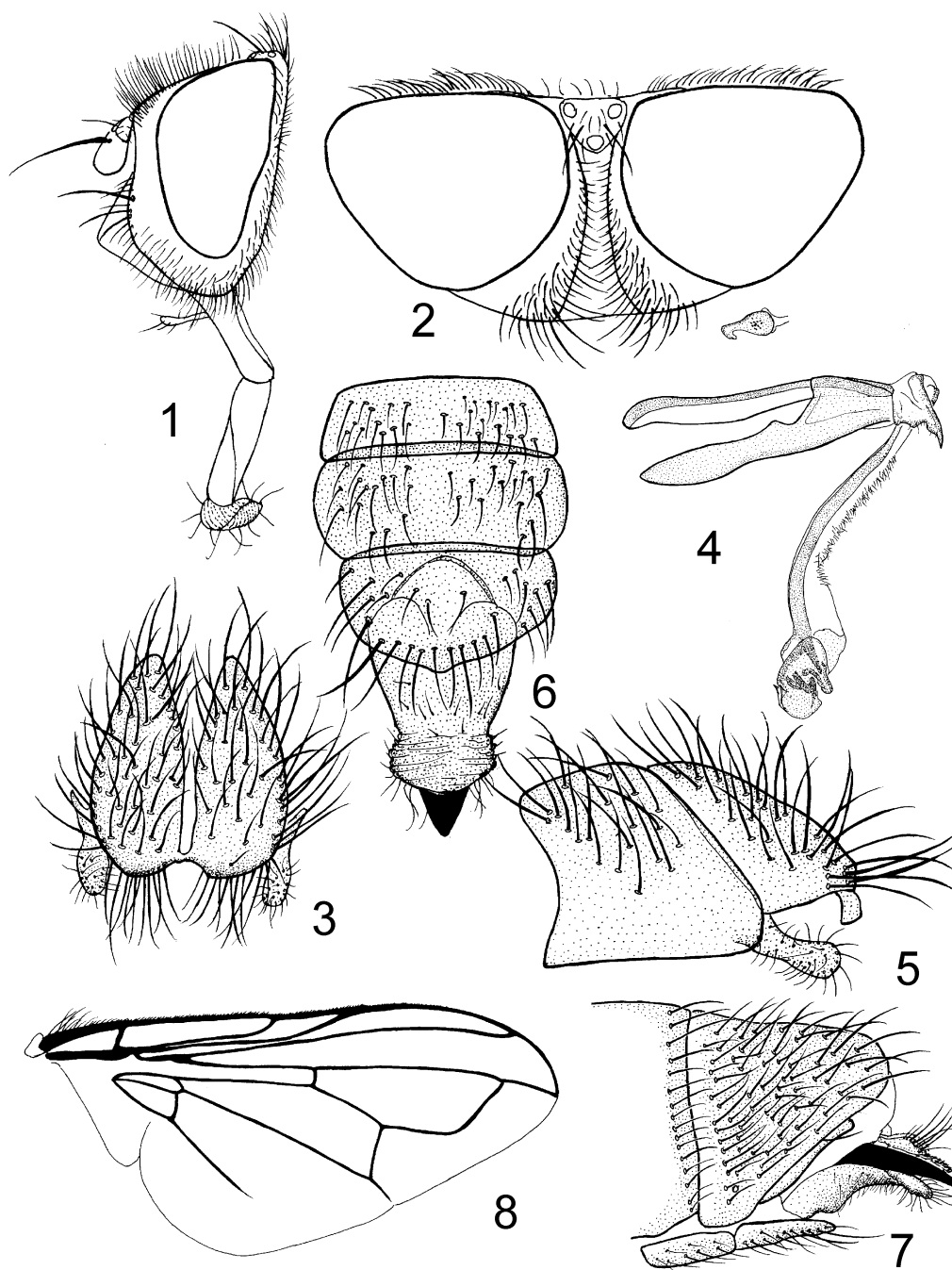




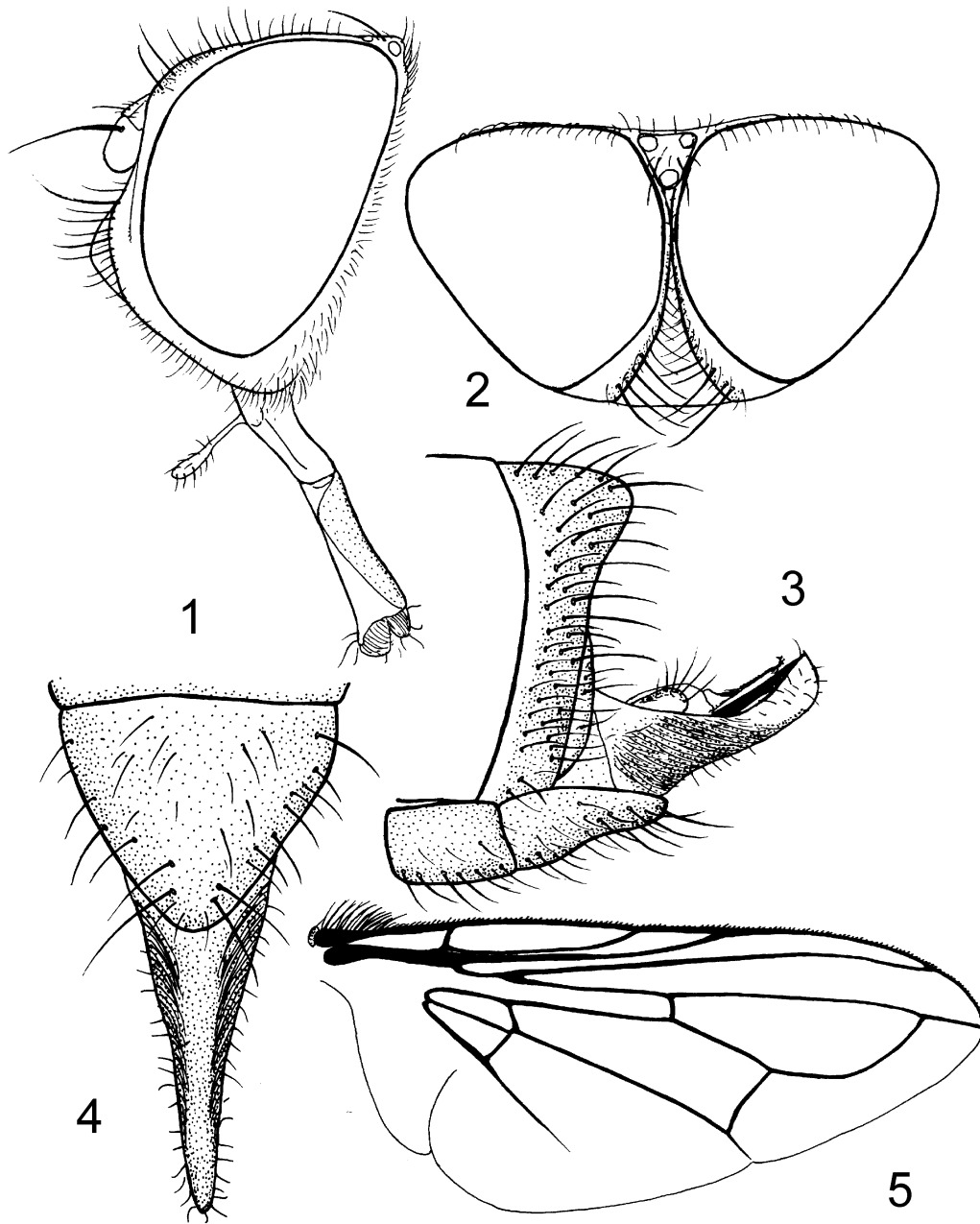
**FIGURE I-6.** *Phasia argentifrons* Walker (Zimbabwe): 1. head profile (♂); 2. dorsal view of head (♂); 3. posterior view of male terminalia; 4. lateral view of male hypandrium complex; 5. lateral view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia.



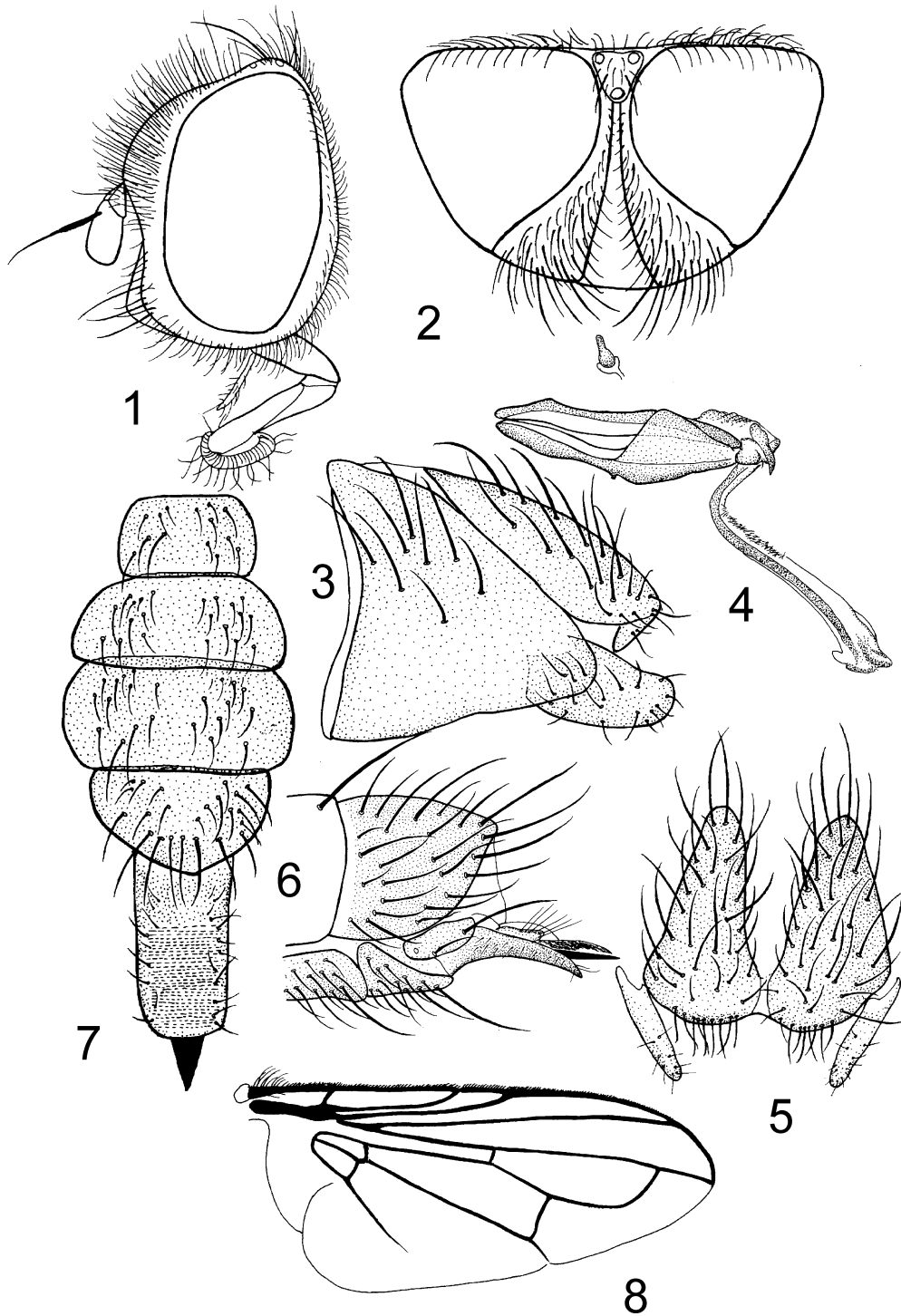
**FIGURE I-7.** *Phasia aurigera* (Egger): 1. head profile (♂, Germany); 2. dorsal view of head (♂, Germany); 3. ventral view of female terminalia (Germany); 4. lateral view of male hypandrium complex (Croatia); 5. lateral view of male terminalia (Croatia); 6. posterior view of male terminalia (Croatia); 7. wing (♂, Germany); 8. lateral view of female terminalia (Germany).



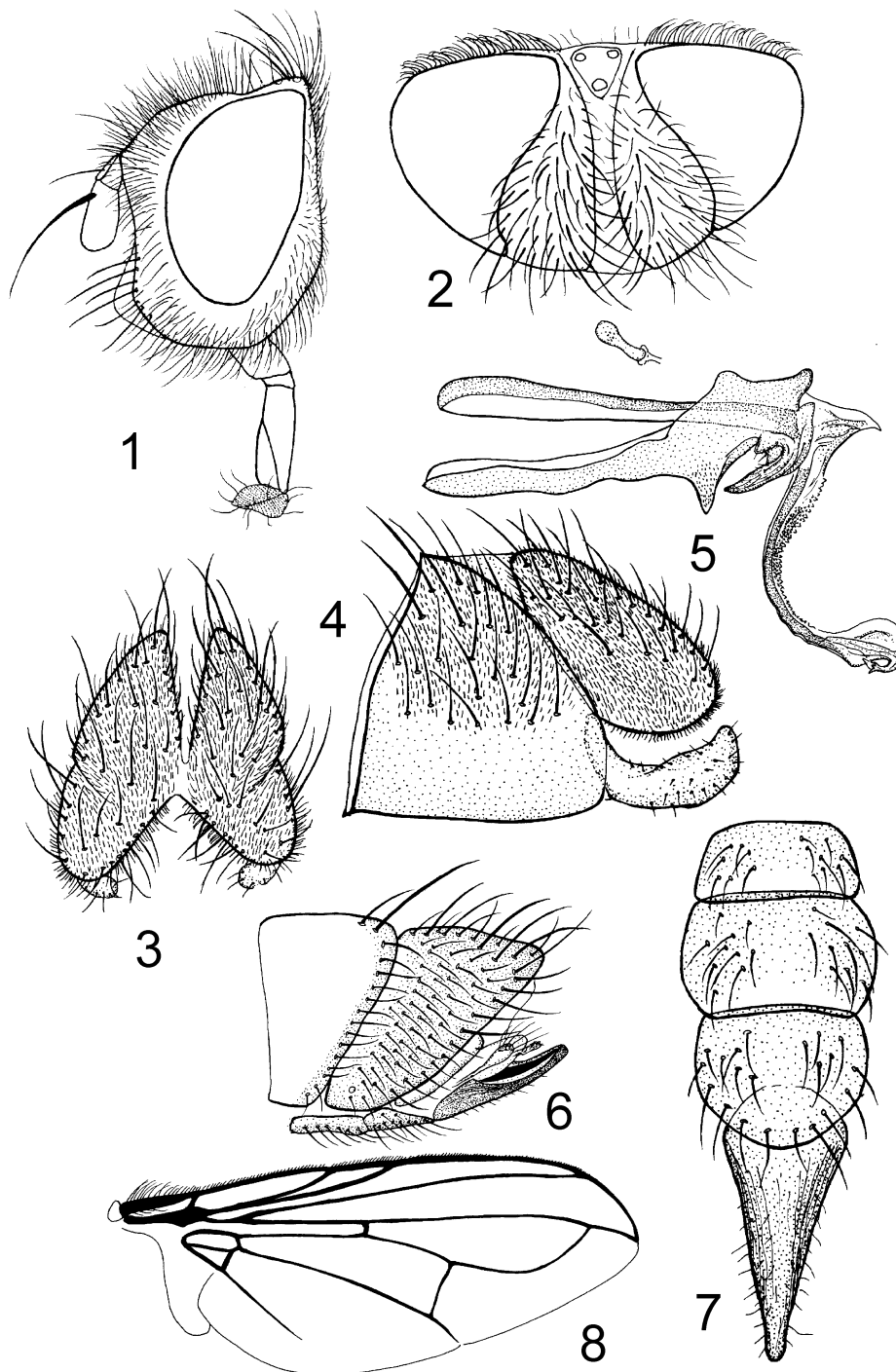
**FIGURE I-8.** *Phasia aurulans* Meigen (USA): 1. head profile ( $\sigma$ , UT); 2. dorsal view of head ( $\sigma$ , UT); 3. posterior view of male terminalia (NH); 4. lateral view of male hypandrium complex (NH); 5. lateral view of male terminalia (NH); 6. ventral view of female terminalia (MI); 7. lateral view of female terminalia (MI); 8. wing ( $\sigma$ , UT).



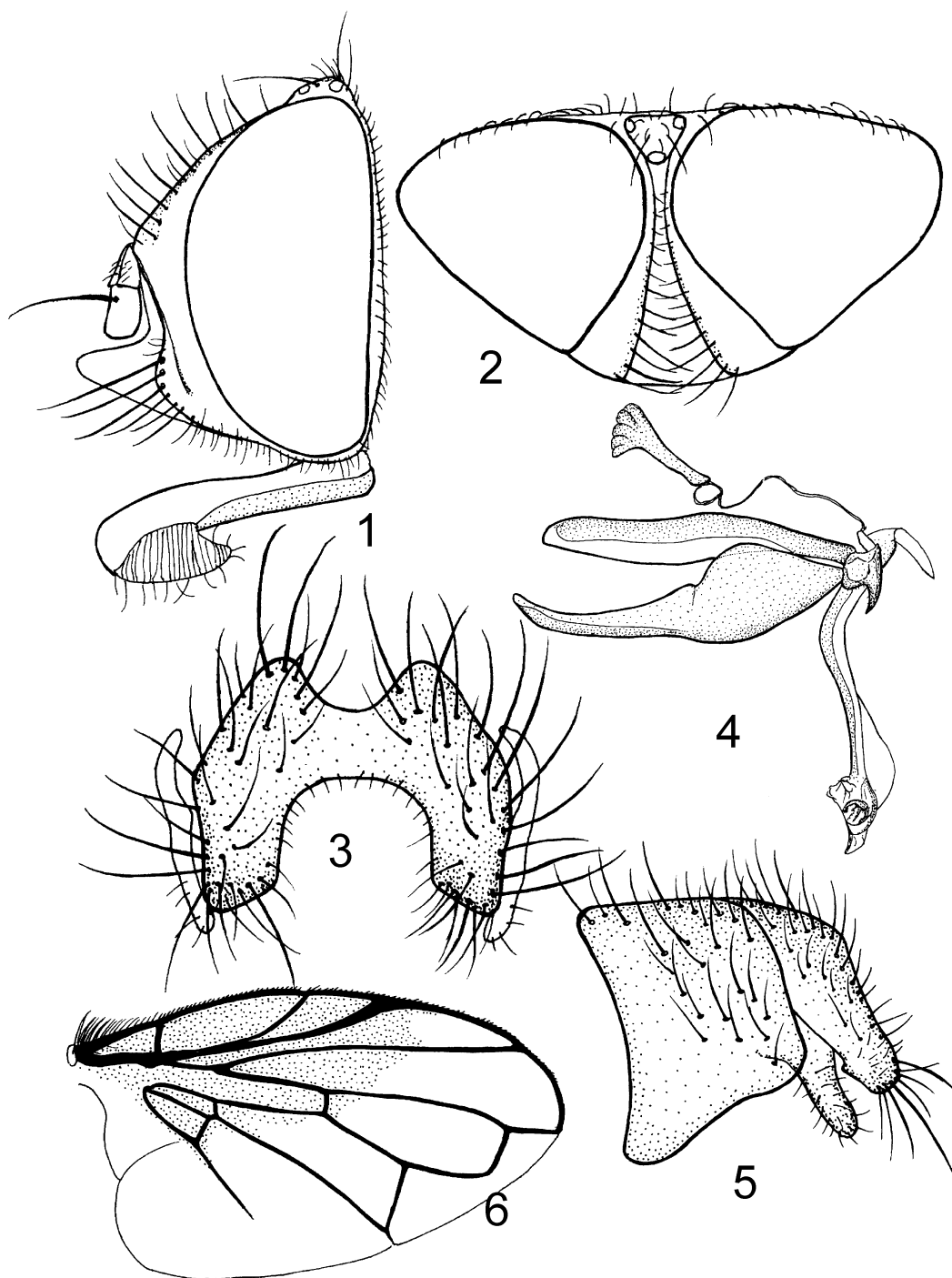
**FIGURE I-9.** *Phasia australiensis* Sun (Australia): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀).



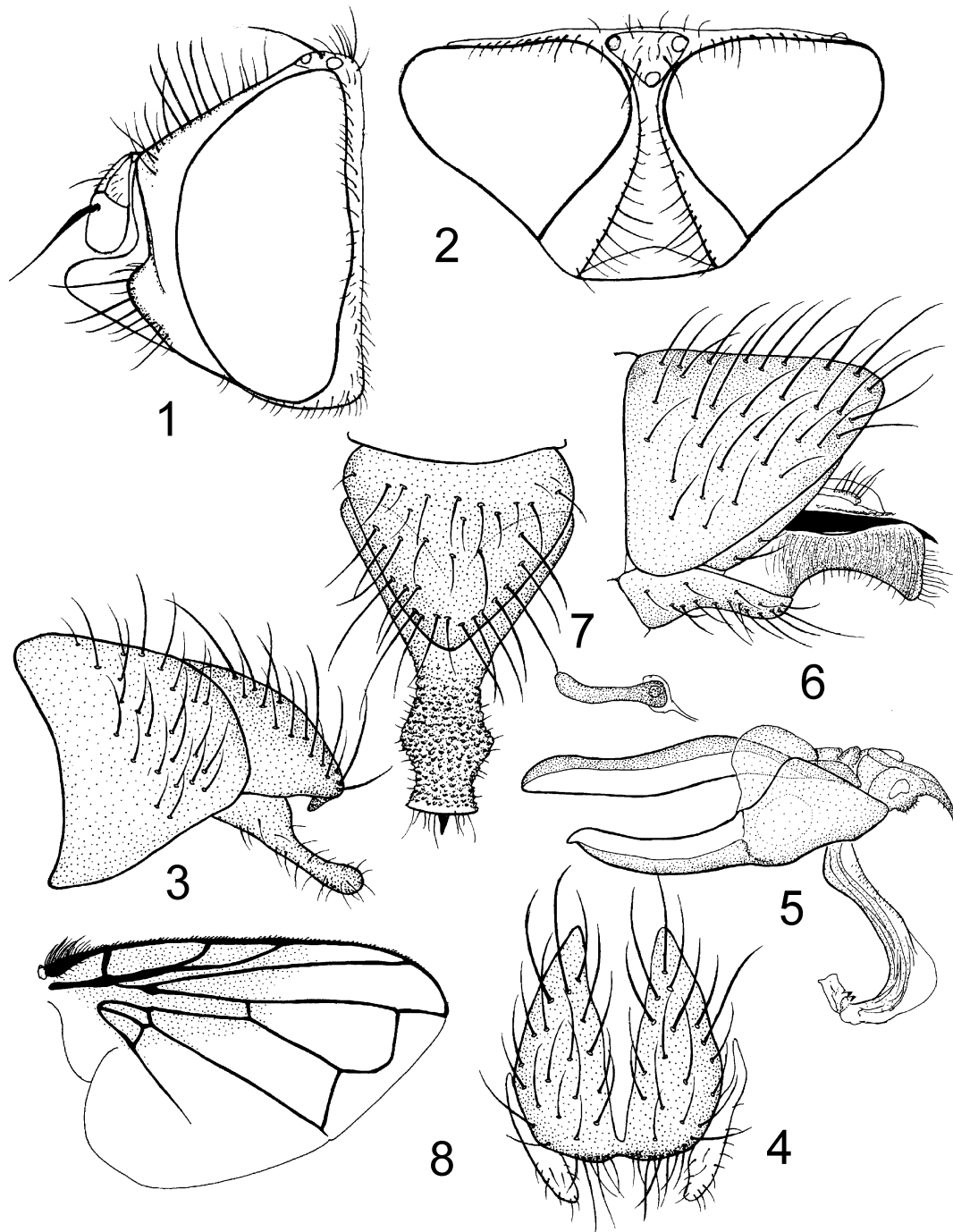
**FIGURE I-10.** *Phasia barbifrons* (Girschner): 1. head profile ( $\sigma$ , Slovakia); 2. dorsal view of head ( $\sigma$ , Slovakia); 3. lateral view of male terminalia (Slovakia); 4. lateral view of male hypandrium complex (Slovakia); 5. posterior view of male terminalia (Slovakia); 6. lateral view of female terminalia (Spain); 7. ventral view of female terminalia (Spain); 8. wing ( $\sigma$ , Slovakia).



**Figure I-11.** *Phasia bifurca* Sun (China): 1. head profile ( $\sigma$ , Sichuan); 2. dorsal view of head ( $\sigma$ , Sichuan); 3. posterior view of male terminalia (Yunnan); 4. lateral view of male terminalia (Yunnan); 5. lateral view of male hypandrium complex (Yunnan); 6. lateral view of female terminalia (Sichuan); 7. ventral view of female terminalia (Sichuan); 8. wing ( $\sigma$ , Sichuan).

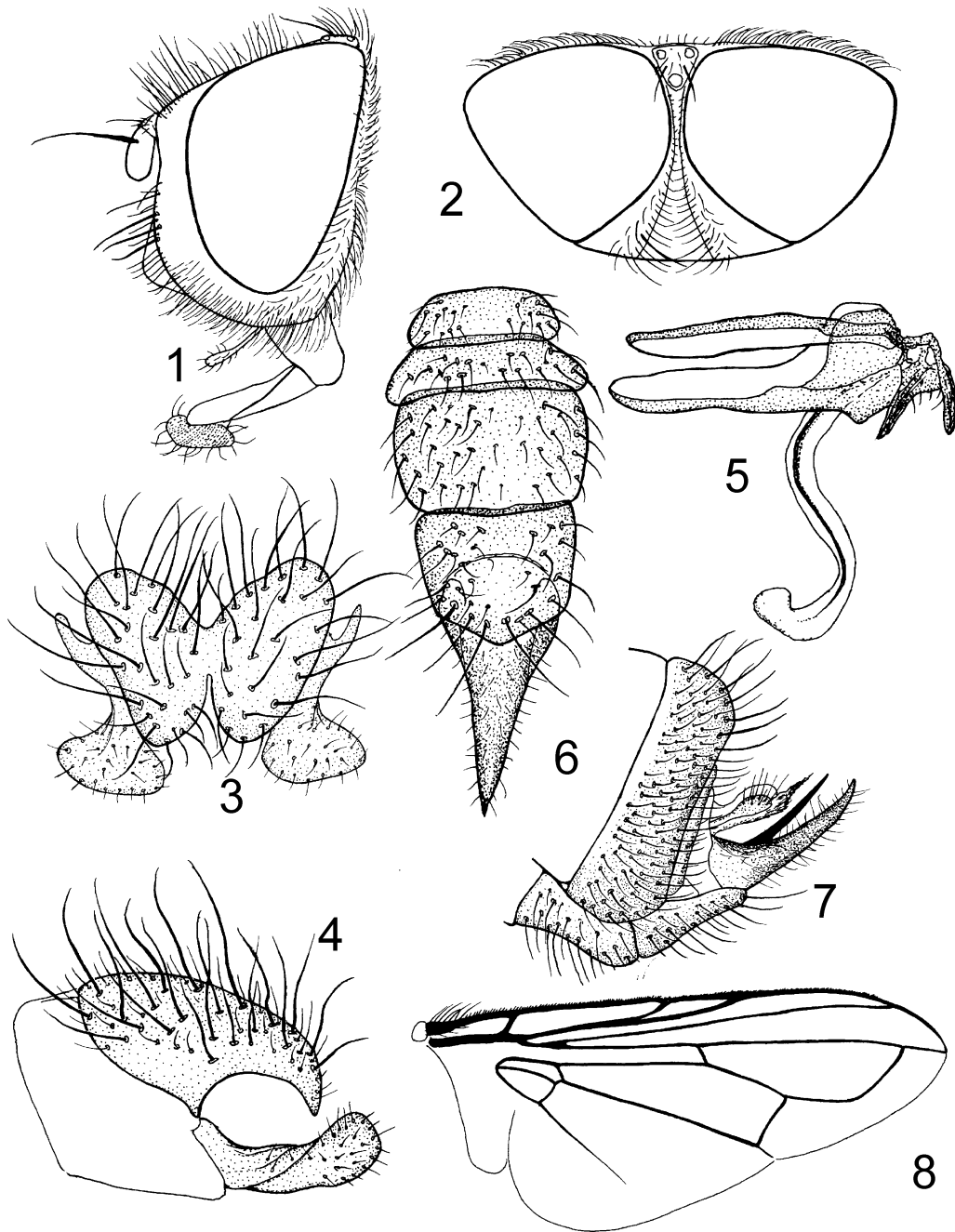


**FIGURE I-12.** *Phasia brachyptera* Sun (Australia): 1. head profile (♂); 2. dorsal view of head (♂); 3. posterior view of male terminalia; 4. lateral view of male hypandrium complex; 5. lateral view of male terminalia; 6. wing (♂).

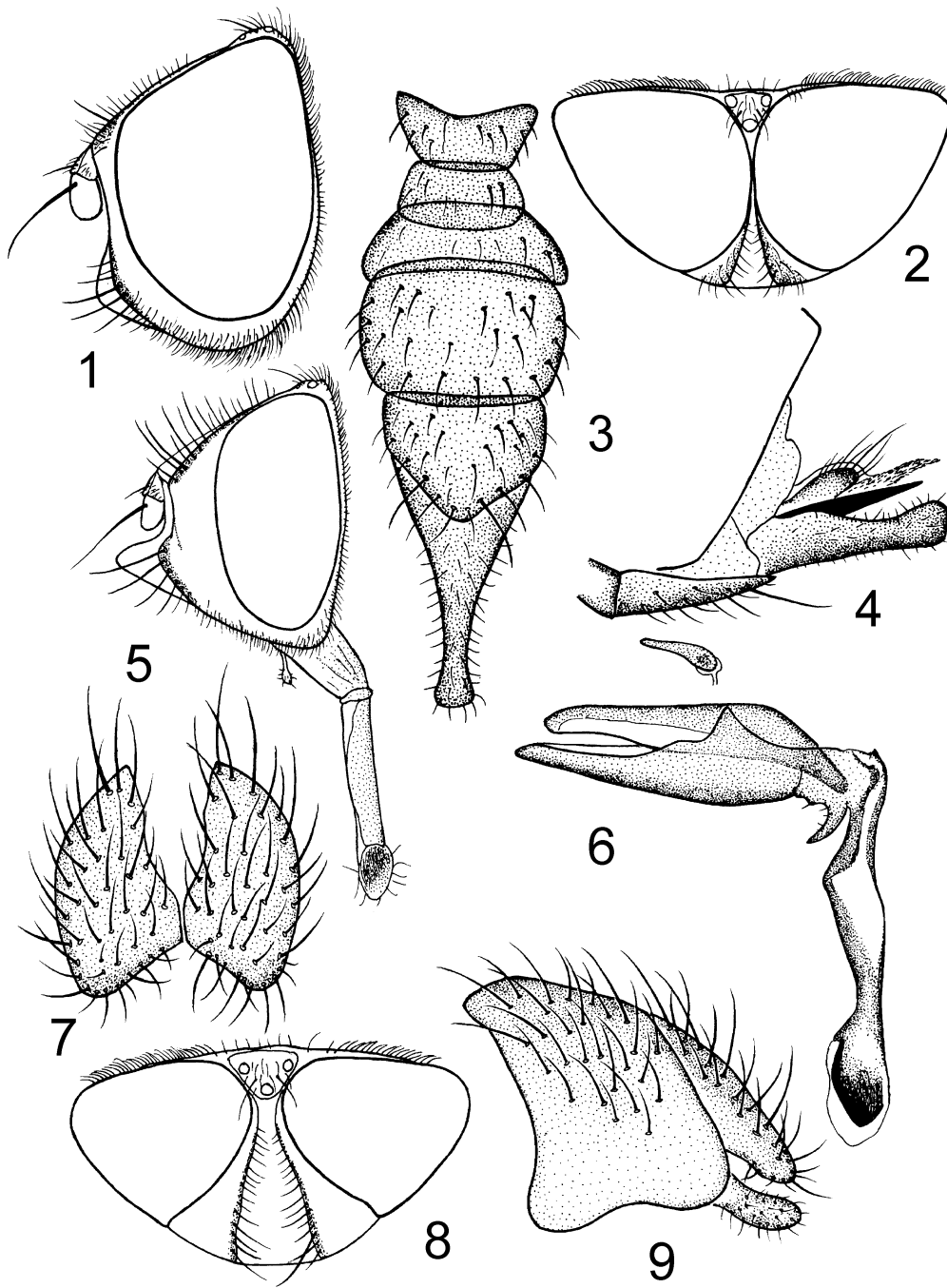


**FIGURE I-13.** *Phasia campbelli* (Miller) (New Zealand): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male terminalia; 4. posterior view of male terminalia; 5. lateral view male hypandrium complex; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing ( $\sigma$ ).

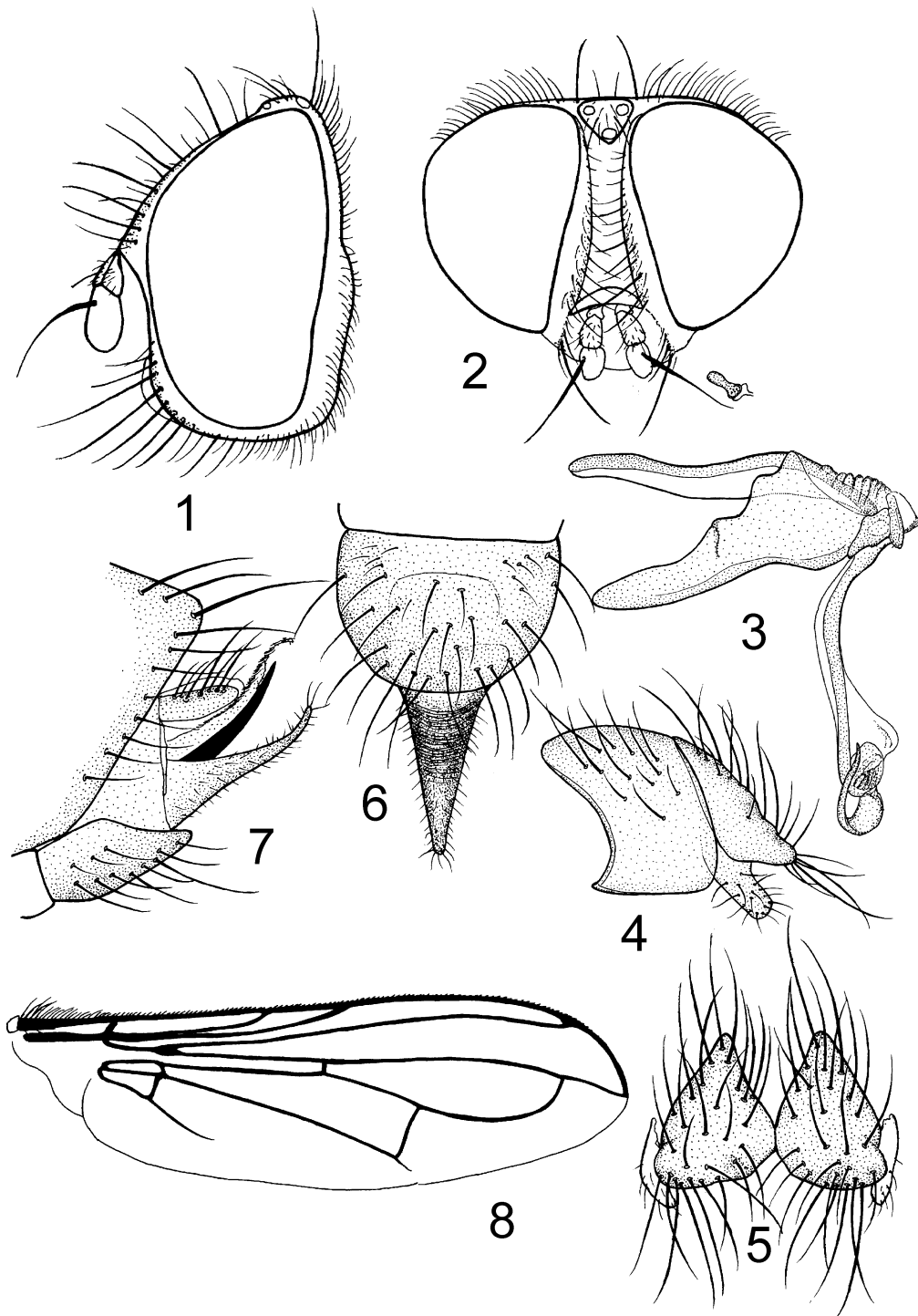




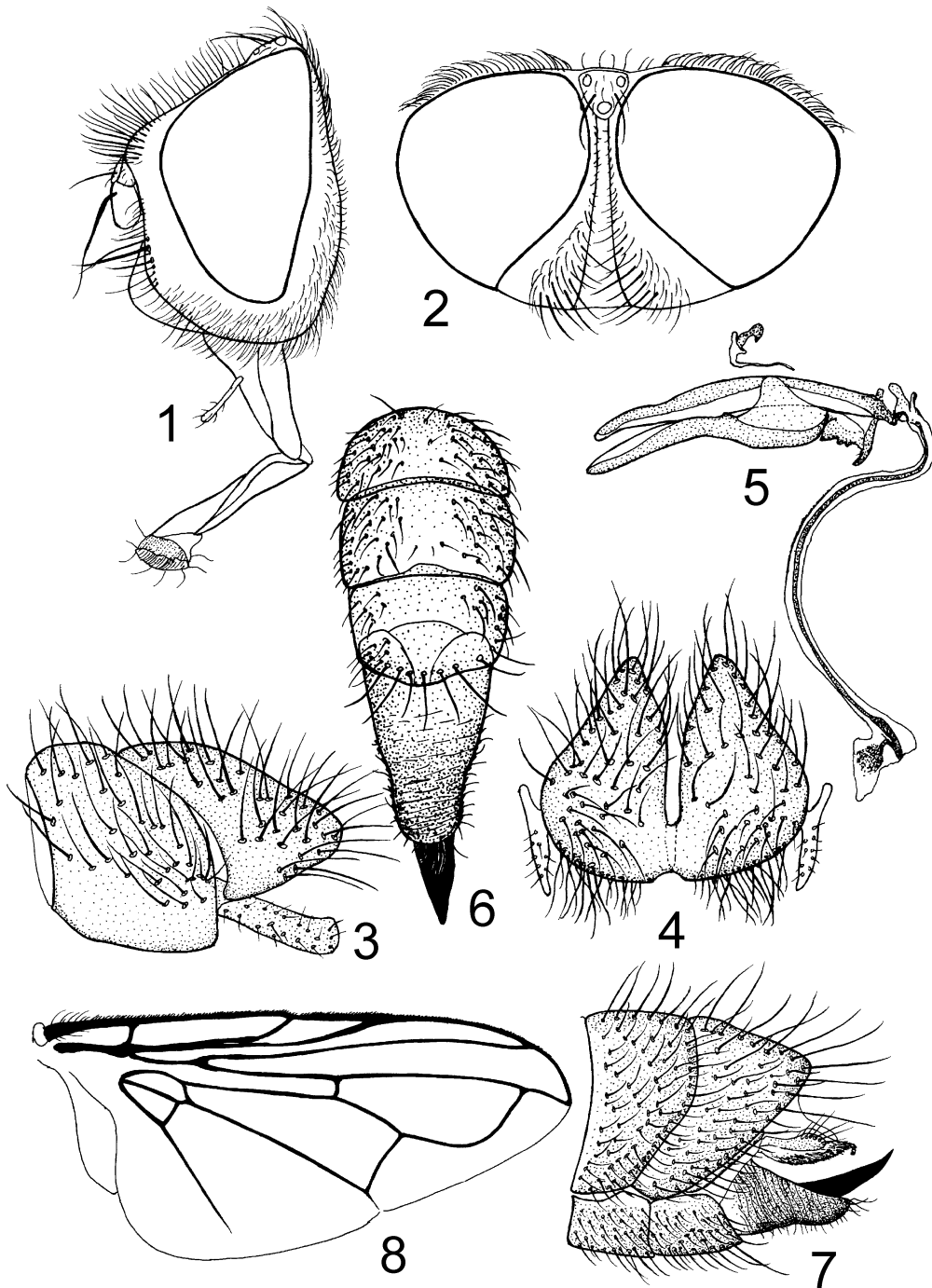
**FIGURE I-14.** *Phasia chilensis* (Macquart) (USA): 1. head profile (♂, AZ); 2. dorsal view of head (♂, AZ); 3. posterior view of male terminalia (IN); 4. lateral view of male terminalia (IN); 5. lateral view of male hypandrium complex (IN); 6. ventral view of female terminalia (MD); 7. lateral view of female terminalia (MD); 8. wing (♂, AZ).



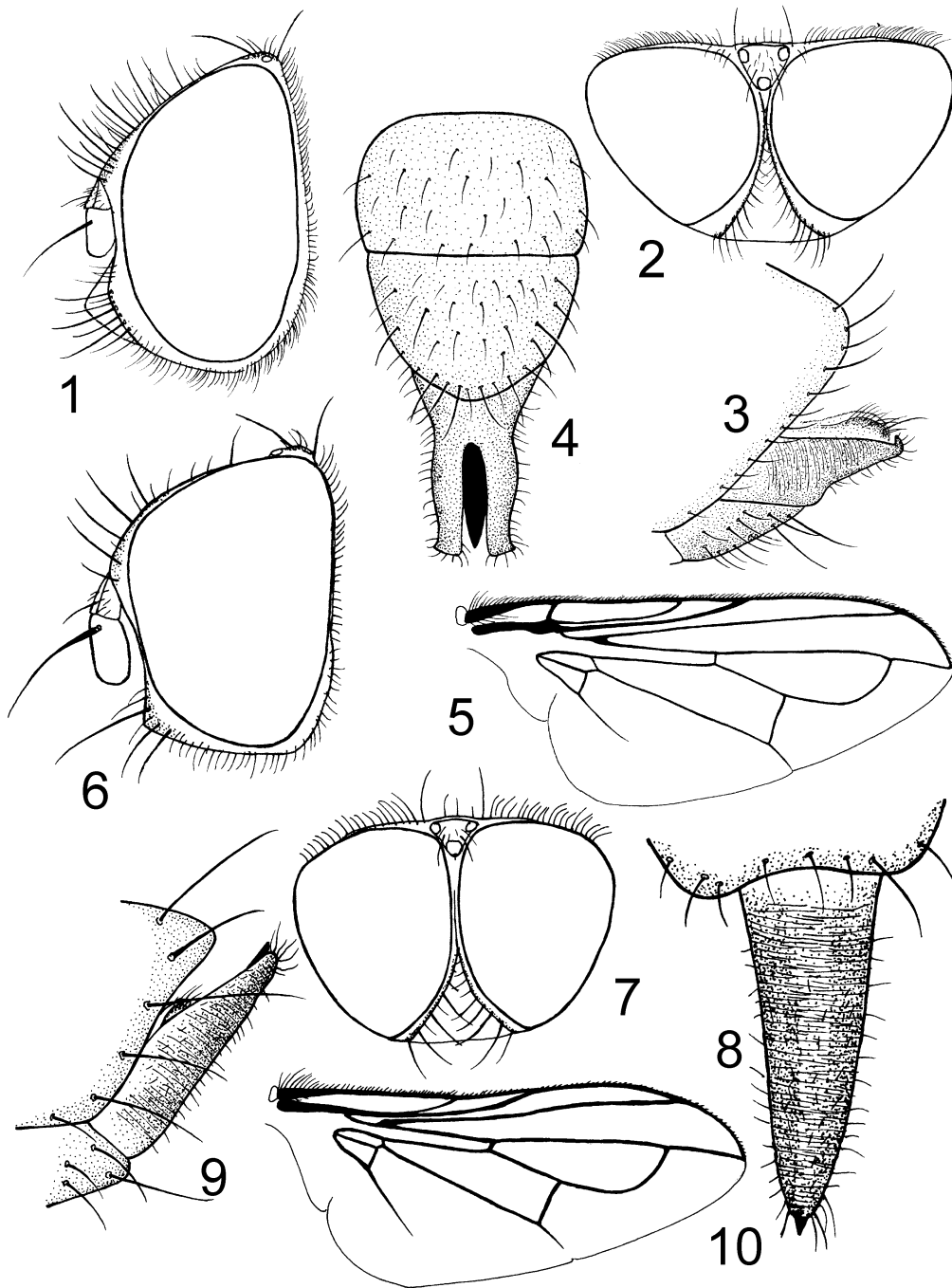
**FIGURE I-15.** 1-4. *Phasia clavigralla* Sun (South Africa): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view female terminalia. 5-9. *Phasia distincta* Sun (South Africa): 5. head profile (♂); 6. lateral view of male hypandrium complex; 7. posterior view of male terminalia; 8. dorsal view of head (♂); 9. lateral view of male terminalia.



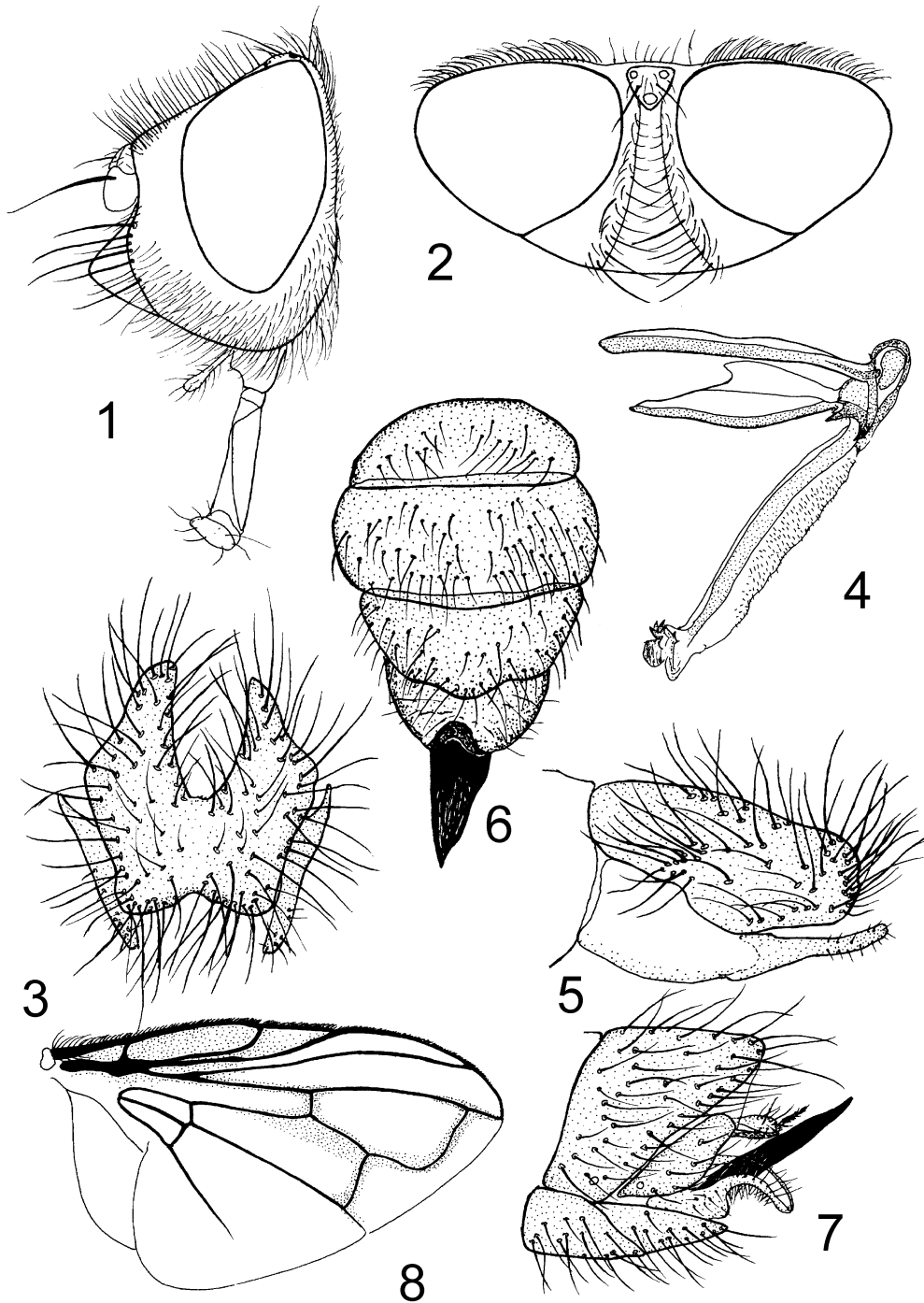
**FIGURE I-16.** *Phasia cylindrata* Sun (Papua New Guinea): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male hypandrium complex; 4. lateral view of male terminalia; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia. 8. wing ( $\sigma$ ).



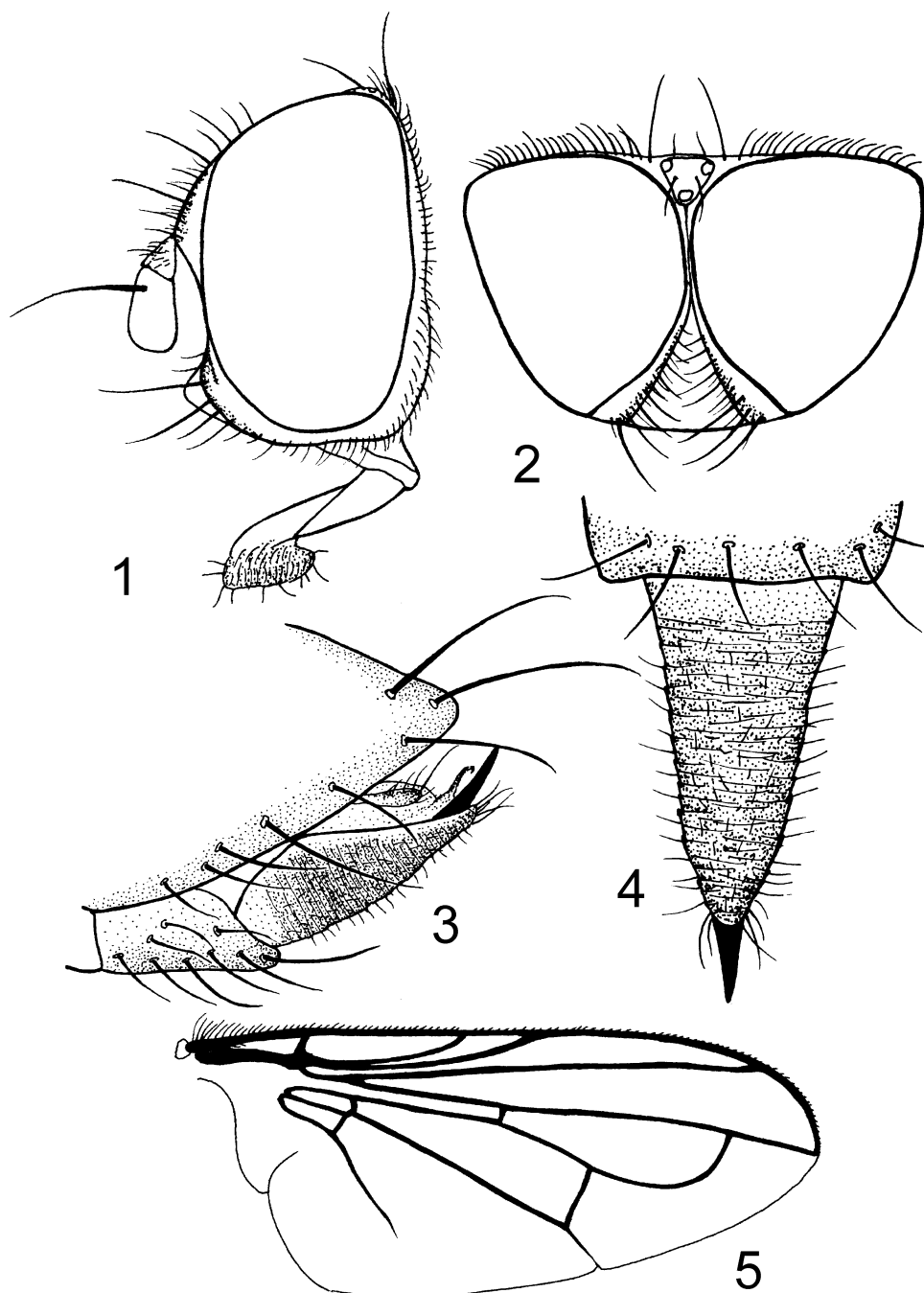
**FIGURE I-17.** *Phasia diversa* (Coquillett): 1. head profile (♂, USA, MS); 2. dorsal view of head (♂, USA, MS); 3. lateral view of male terminalia (Canada, ON); 4. posterior view of male terminalia (Canada, ON); 5. lateral view of male hypandrium complex (Canada, ON); 6. ventral view of female terminalia (Canada, ON); 7. lateral view of female terminalia (Canada, ON); 8. wing (♂, USA, MS).



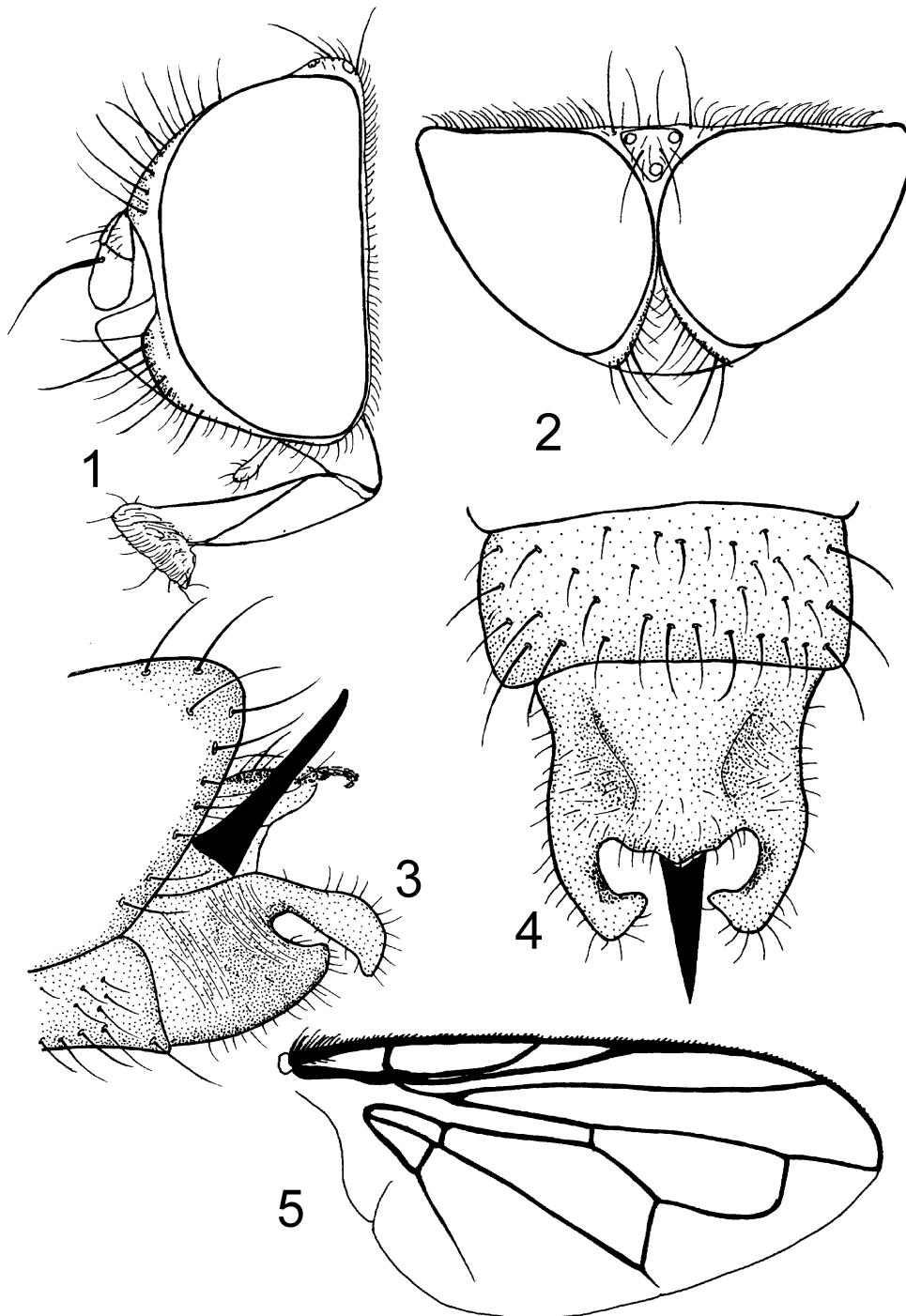
**FIGURE I-18.** 1-5. *Phasia emdeni* (Draber-Moňko) (Spain): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀). 6-10. *Phasia faceta* Sun (Papua New Guinea): 6. head profile (♀); 7. dorsal view of head (♀); 8. ventral view of female terminalia; 9. lateral view of female terminalia; 10. wing (♀).



**FIGURE I-19.** *Phasia fenestrata* (Bigot) (USA): 1. head profile ( $\sigma$ , MS); 2. dorsal view of head ( $\sigma$ , MS); 3. posterior view of male terminalia (VA); 4. lateral view of male hypandrium complex (VA); 5. lateral view of male terminalia (VA); 6. ventral view of female terminalia (IN); 7. lateral view of female terminalia (IN); 8. wing ( $\sigma$ , MS).

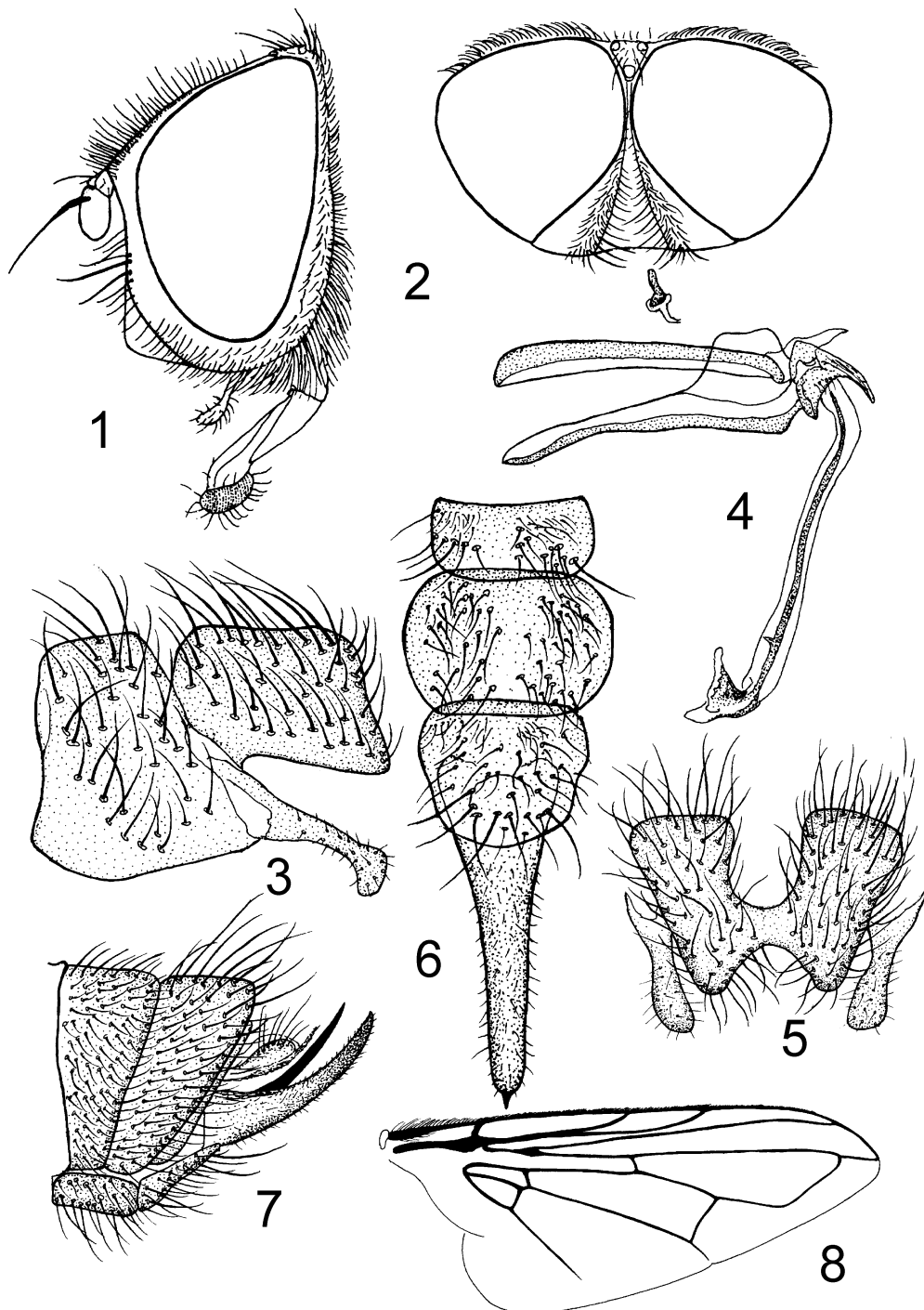


**FIGURE I-20.** *Phasia frontata* Sun, (Australia): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀).

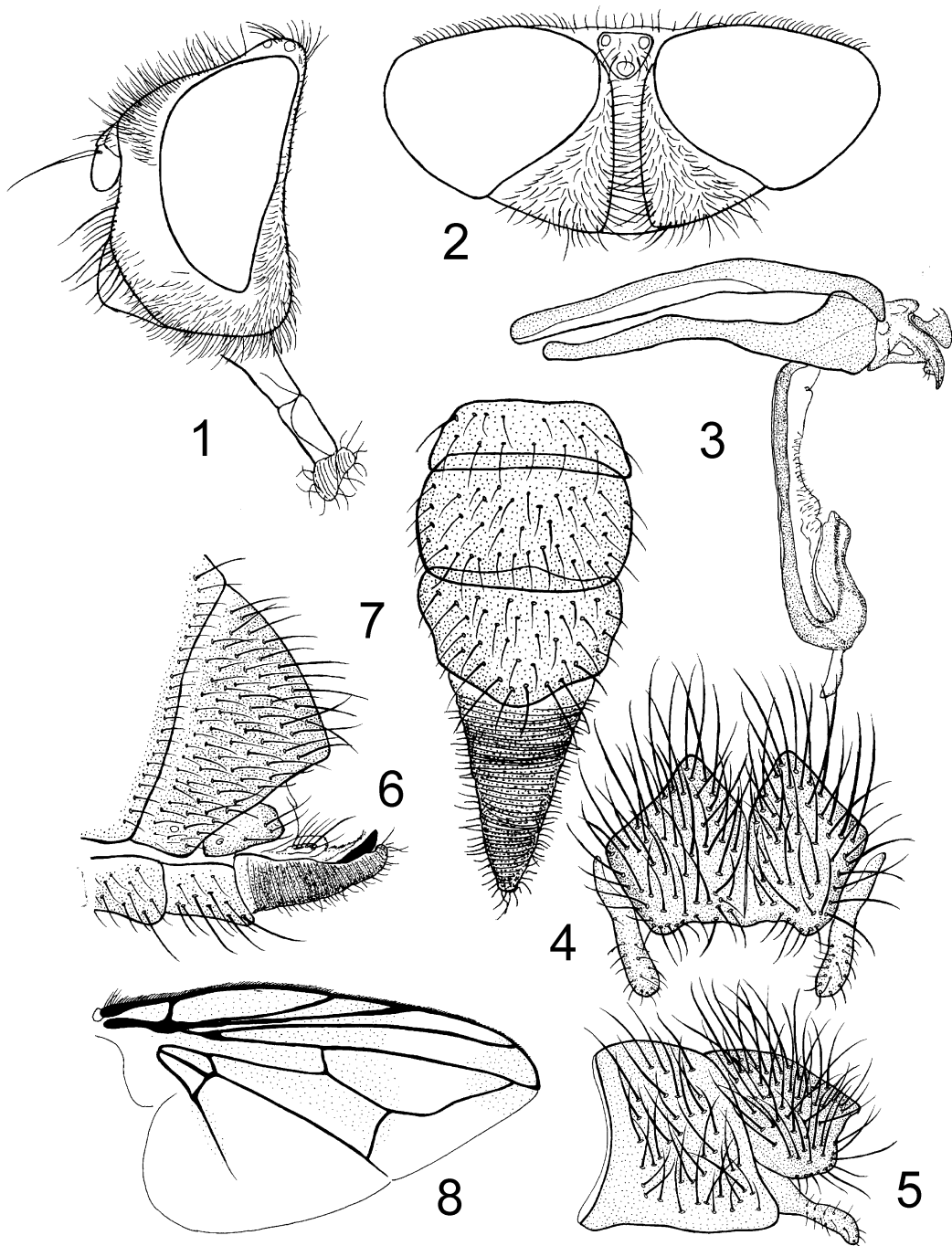


**FIGURE I-21.** *Phasia furcata* Sun ( Australia): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀).

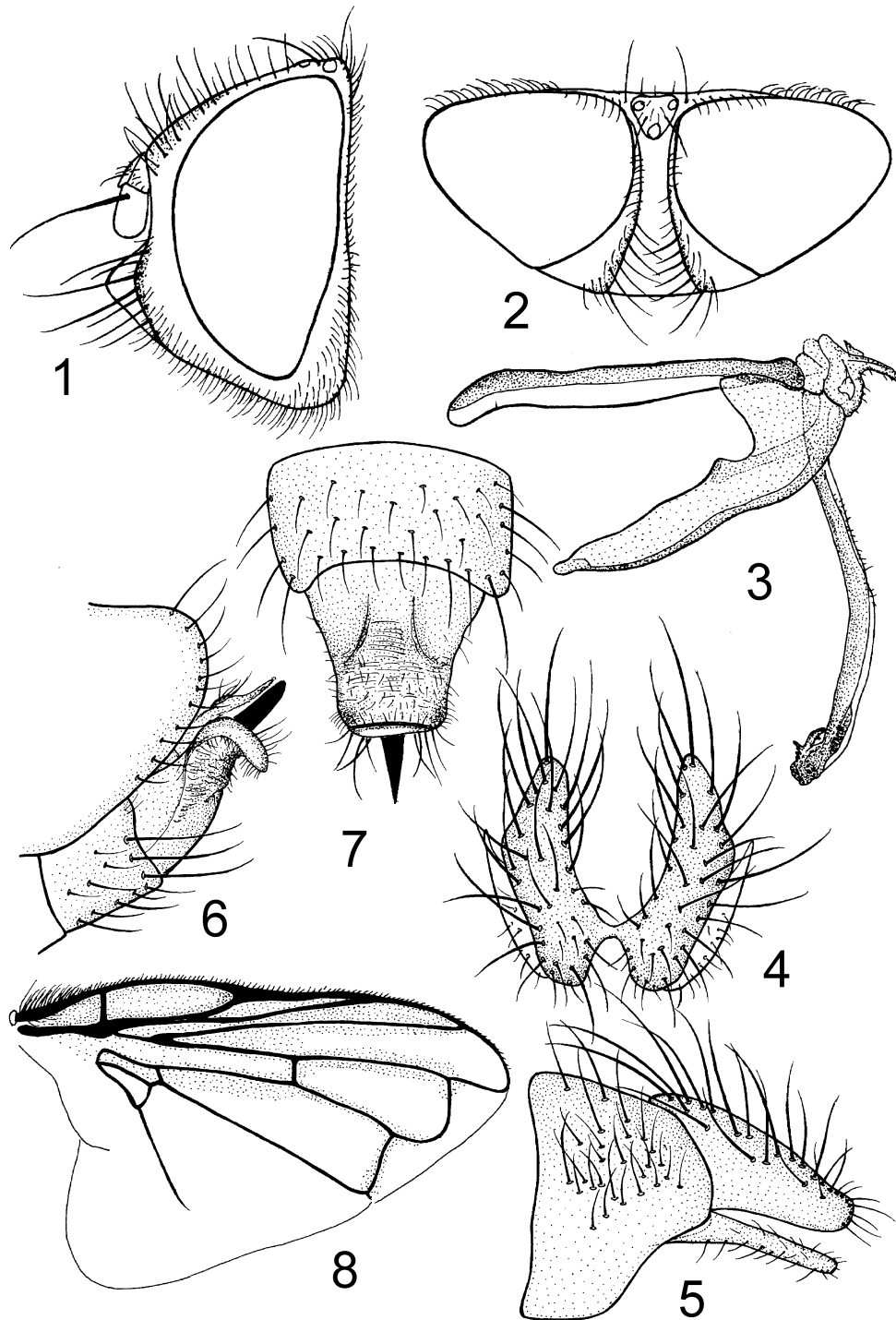




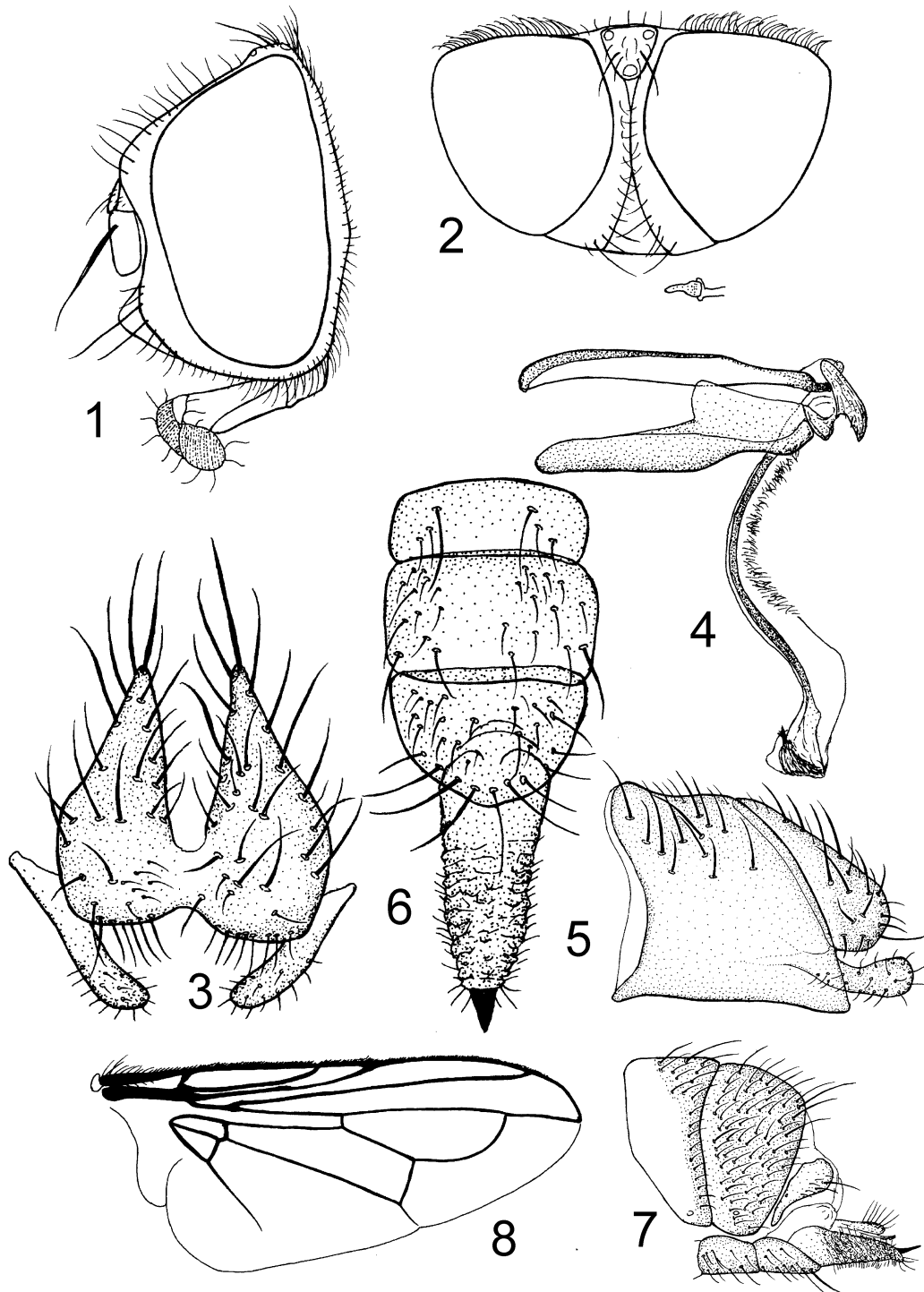
**FIGURE I-22.** *Phasia grandis* (Coquillett) (USA): 1. head profile ( $\sigma$ , TX); 2. dorsal view of head ( $\sigma$ , TX); 3. lateral view of male terminalia (VA). 4. lateral view of male hypandrium complex (VA); 5. posterior view of male terminalia (VA); 6. ventral view of female terminalia (TX); 7. lateral view of female terminalia (MS); 8. wing ( $\sigma$ , TX).



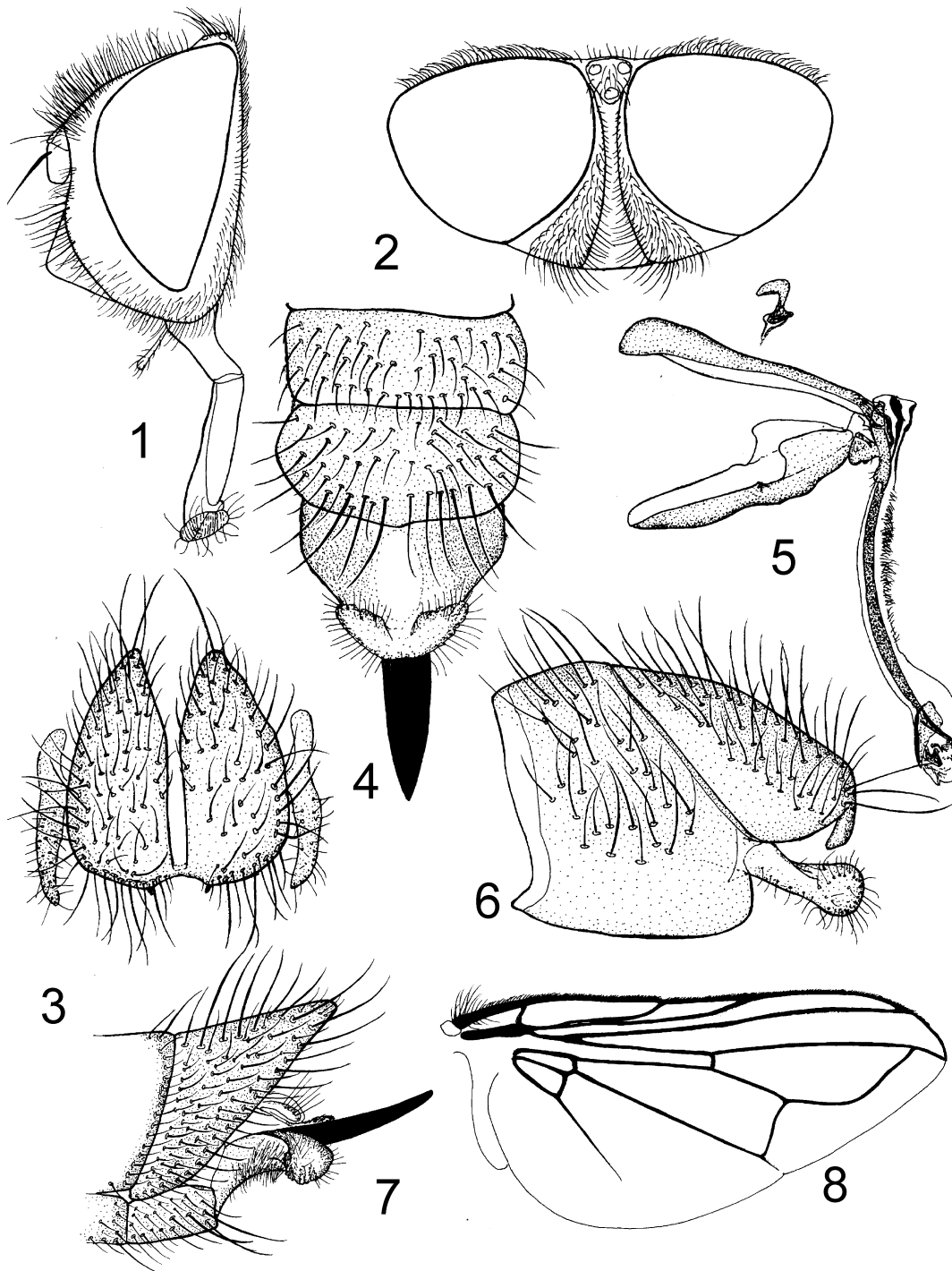
**FIGURE I-23.** *Phasia hemiptera* (Fabricius) (Russia): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male hypandrium complex; 4. posterior view of male terminalia; 5. lateral view of male terminalia; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing ( $\sigma$ ).



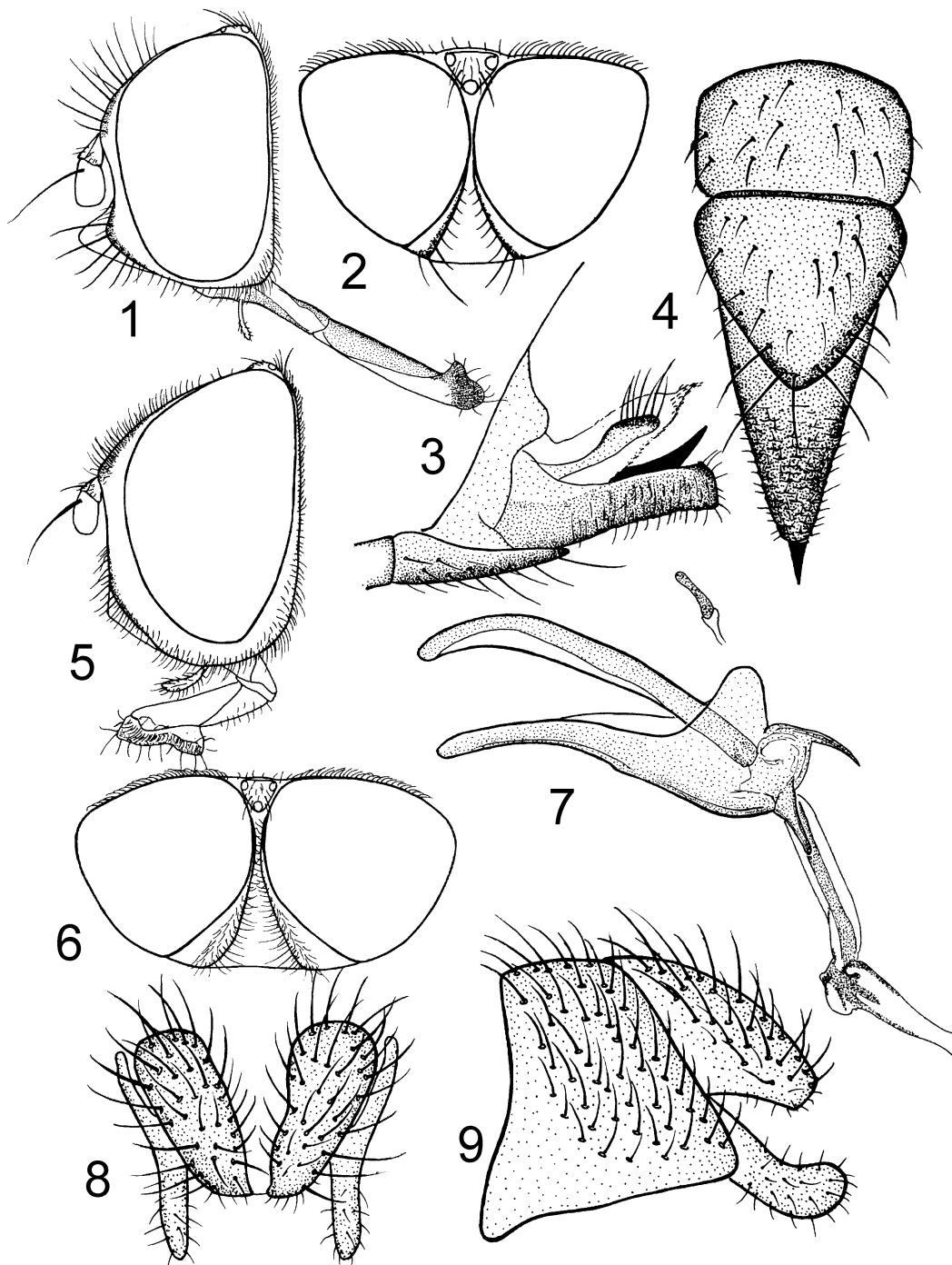
**FIGURE I-24.** *Phasia hippobosca* (Paramonov) (Australia): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male hypandrium complex; 4. posterior view of male terminalia; 5. lateral view of male terminalia; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing (♂)



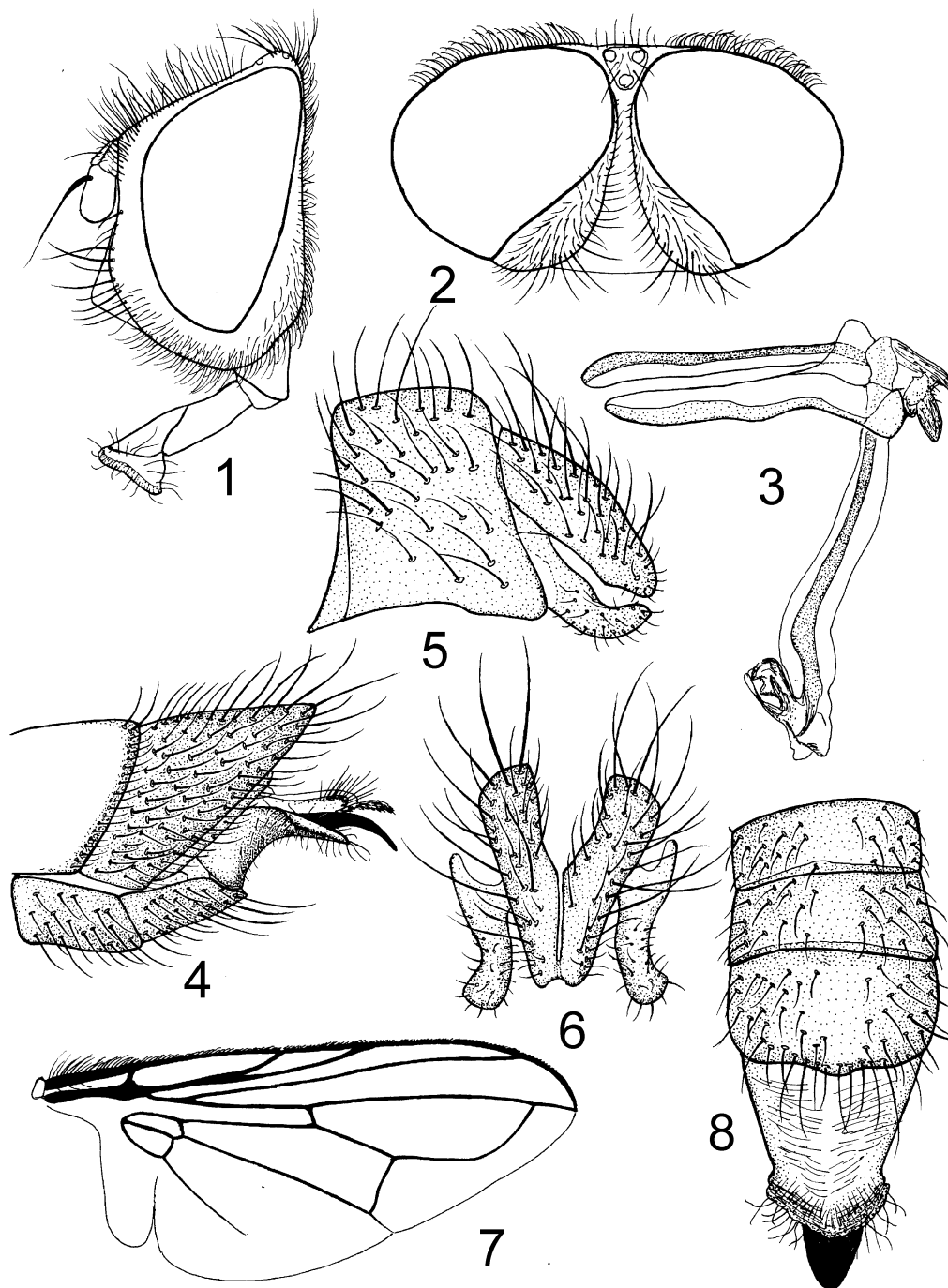
**FIGURE I-25.** *Phasia indica* (Mesnil) (India): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. posterior view of male terminalia; 4. lateral view of male hypandrium complex; 5. lateral view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing ( $\sigma$ ).



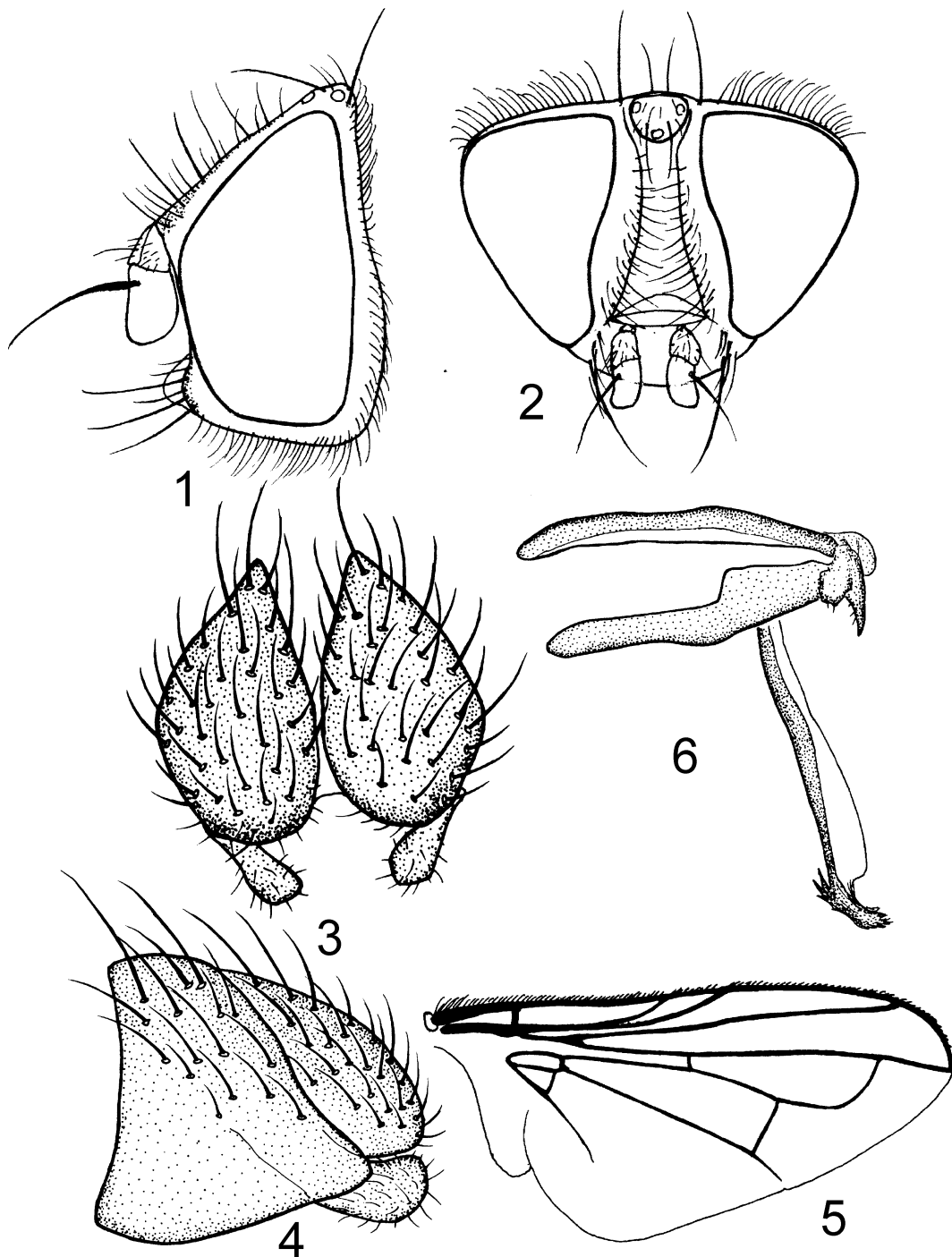
**FIGURE I-26.** *Phasia japonensis* Sun (Japan): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. posterior view of male terminalia; 4. ventral view of female terminalia; 5. lateral view of male hypandrium complex; 6. lateral view of male terminalia; 7. lateral view of female terminalia; 8. wing ( $\sigma$ ).



**FIGURE I-27.** *Phasia jeanneli* (Mesnil) (South Africa): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia. 5-9. *Phasia malayana* Sun (Malaysia): 5. head profile (♂); 6. dorsal view of head (♂); 7. lateral view of male hypandrium complex; 8. posterior view of male terminalia; 9. lateral view of male terminalia.

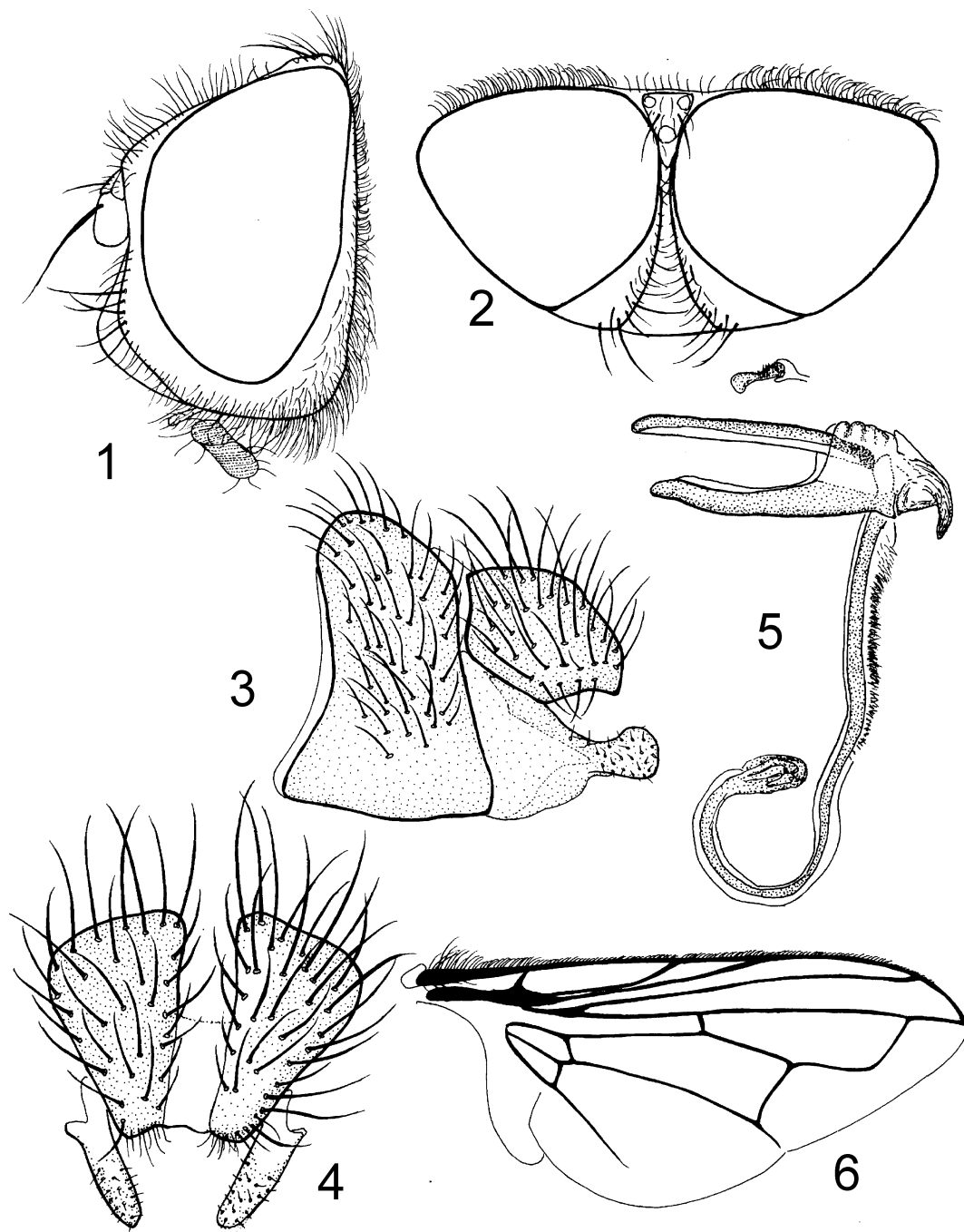


**FIGURE I-28.** *Phasia kudoii* Sun (Japan): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male hypandrium complex; 4. lateral view of female terminalia; 5. lateral view of male terminalia; 6. posterior view of male terminalia; 7. wing ( $\sigma$ ); 8. ventral view of female terminalia.

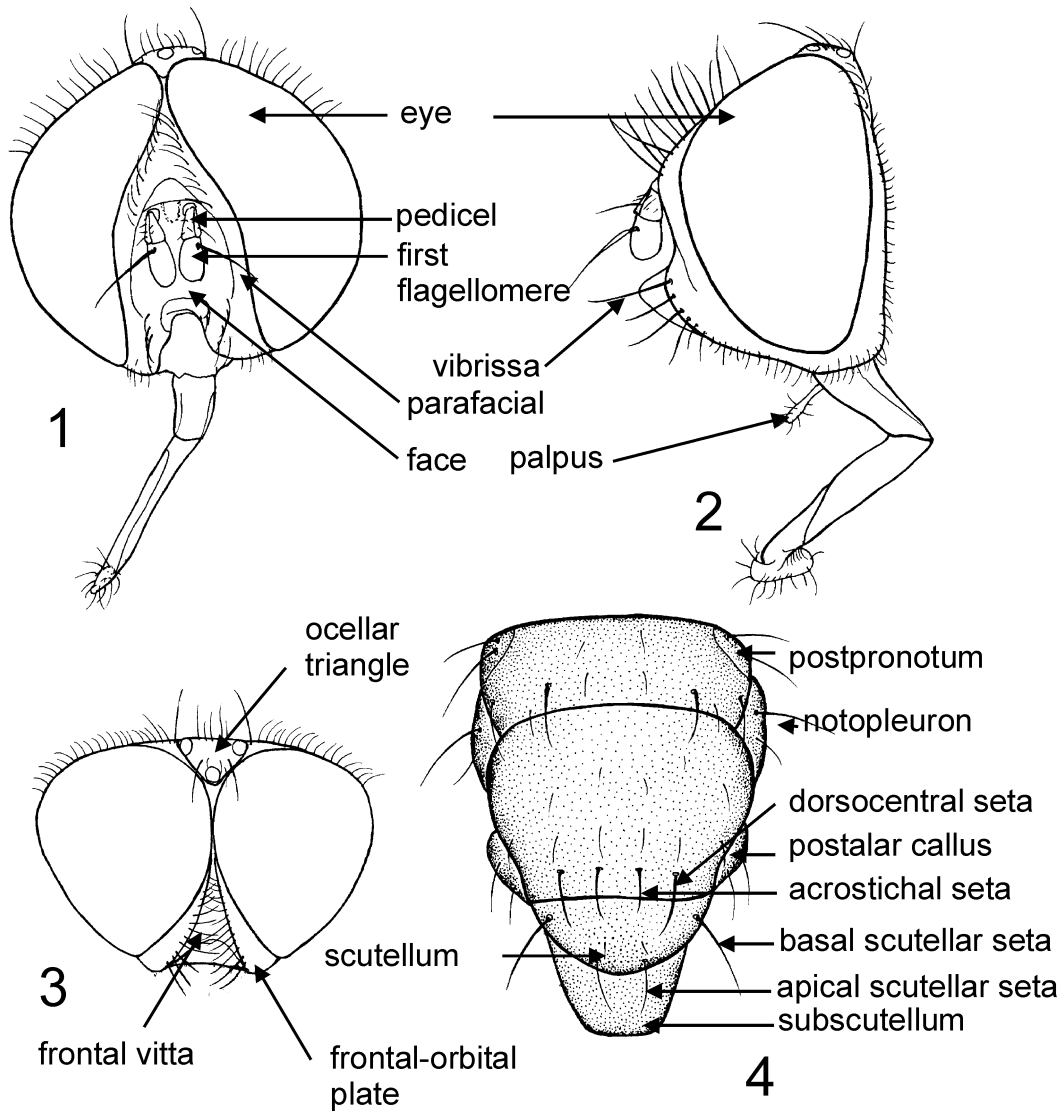


**FIGURE I-29.** *Phasia latifrons* (Paramonov) (Australia): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. posterior view of male terminalia; 4. lateral view of male terminalia; 5. wing ( $\sigma$ ); 6. lateral view of male hypandrium complex.

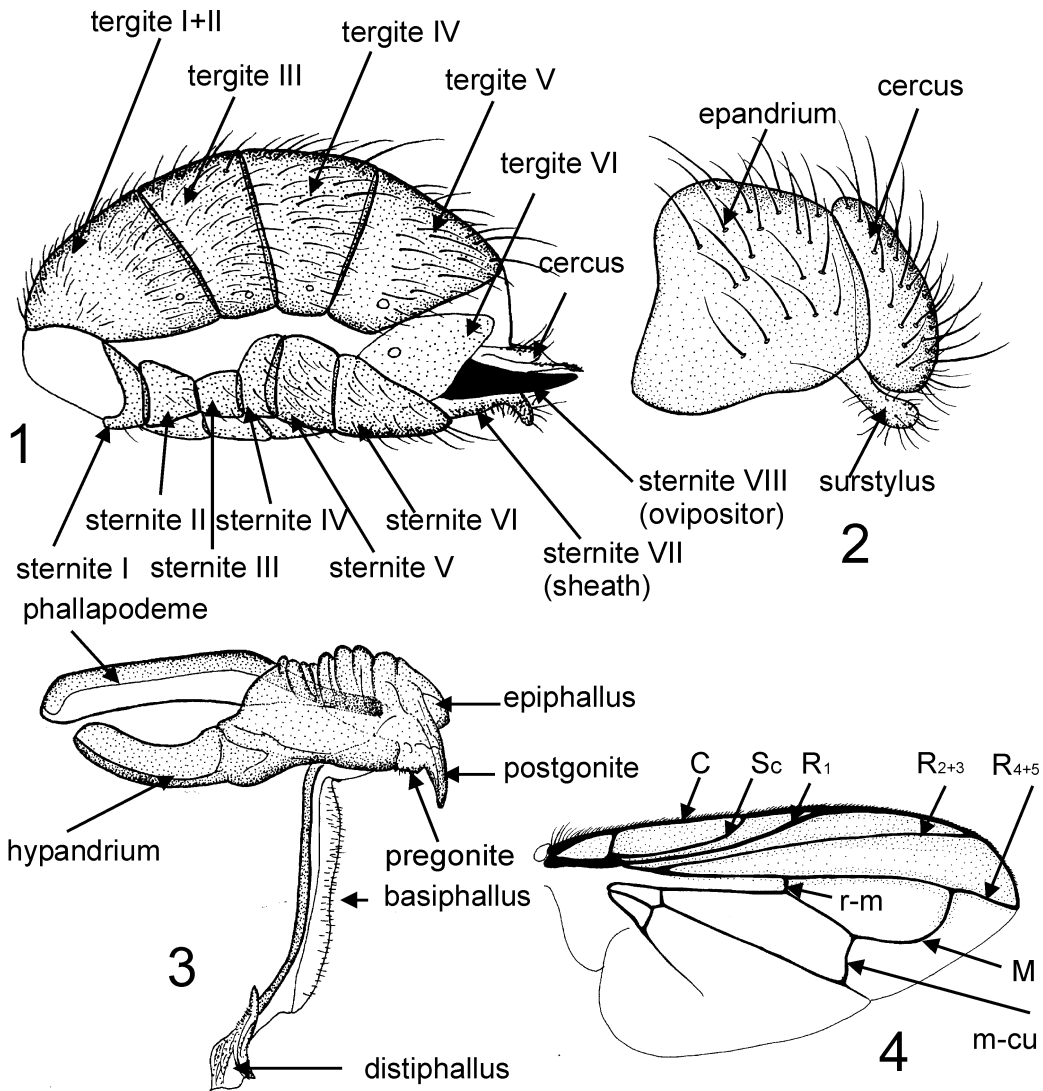




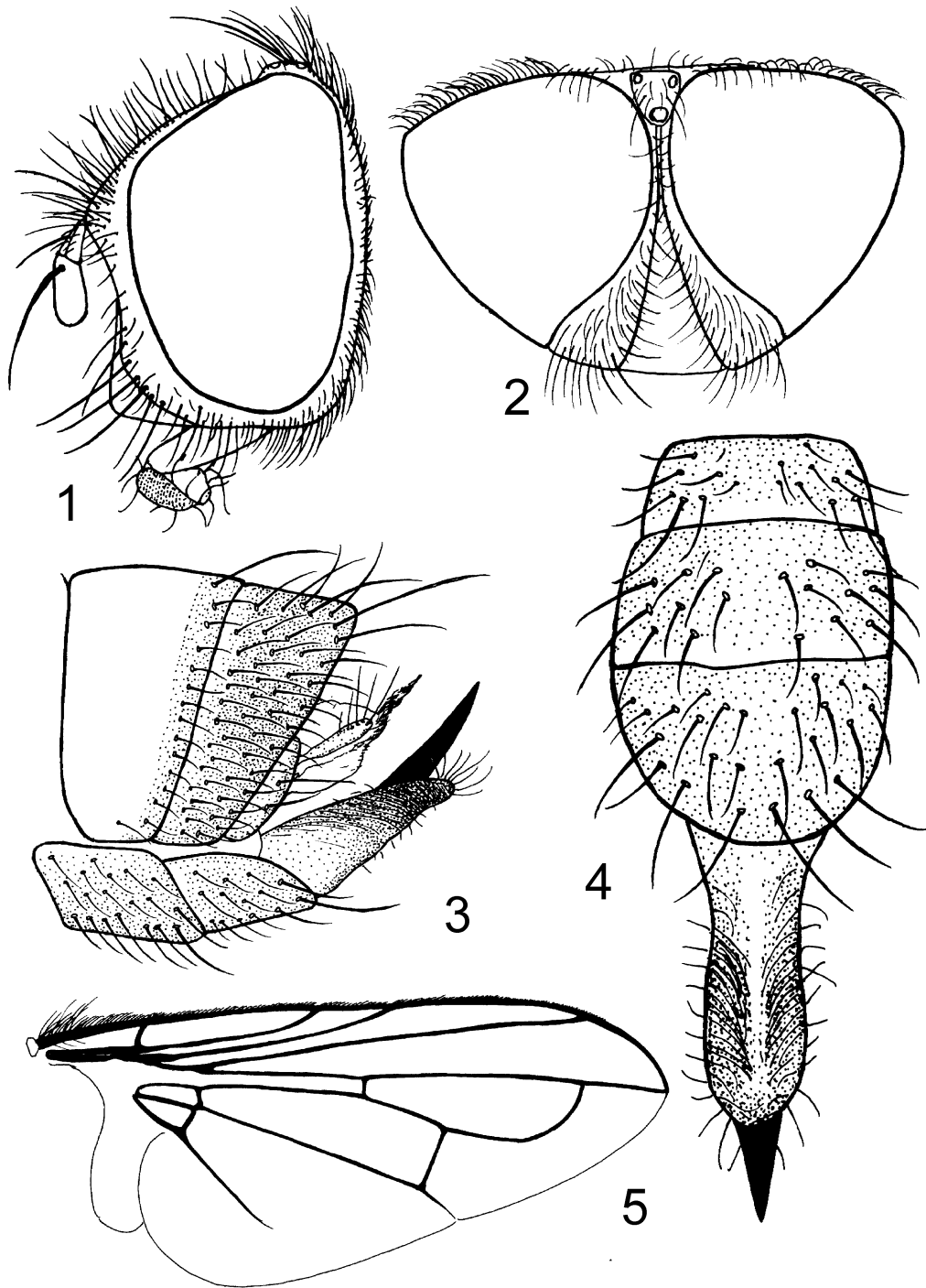
**FIGURE I-30.** *Phasia lauta* Sun (Indonesia): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male terminalia; 4. posterior view of male terminalia; 5. lateral view of male hypandrium complex; 6. wing (♂).



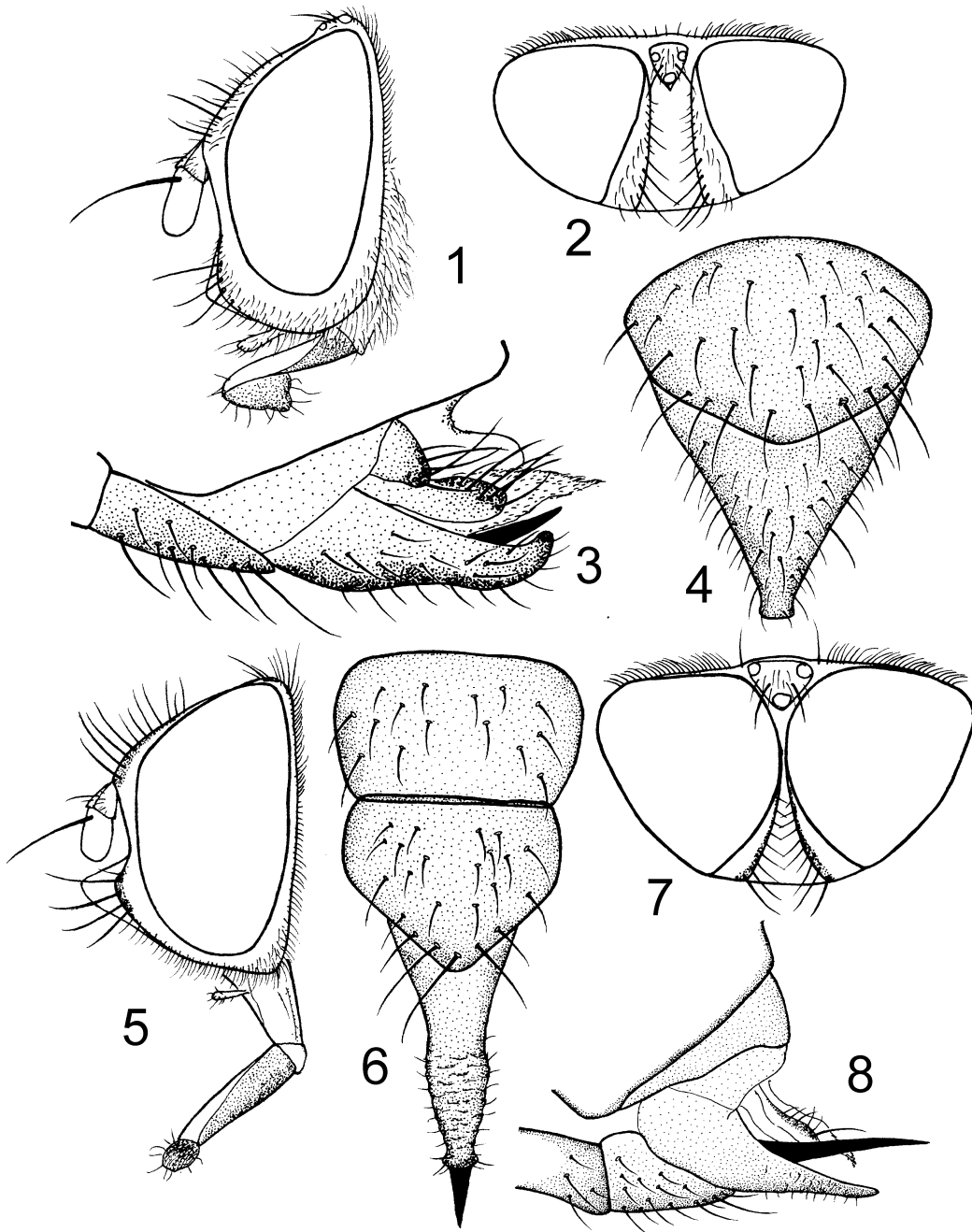
**FIGURE I-31.** *Phasia lepidofera* (Malloch) (Australia): 1. frontal view of head (♀); 2. head profile (♀); 3. dorsal view of head (♀); 4. dorsal view of thorax (♂).



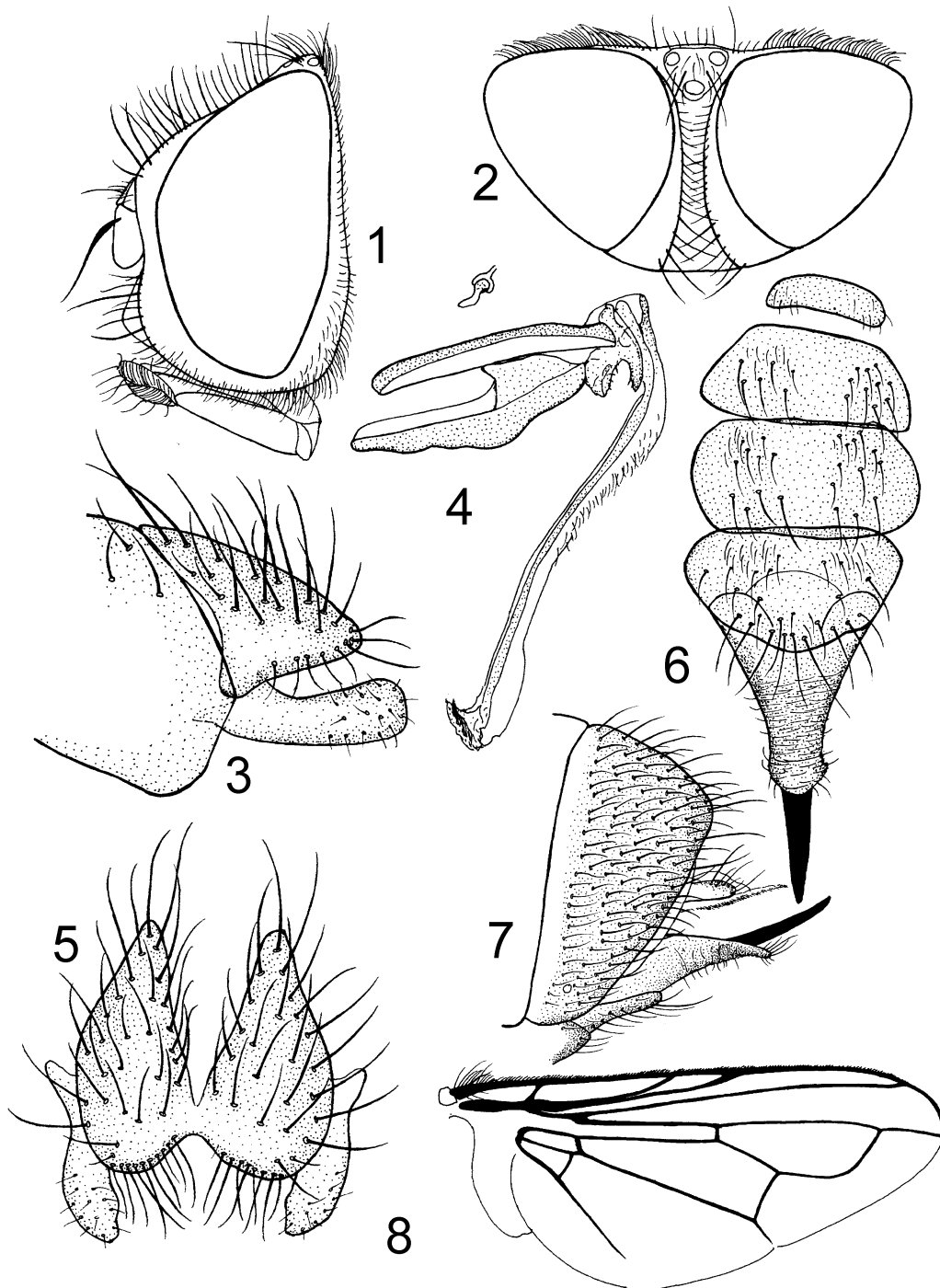
**FIGURE I-32.** *Phasia lepidofera* (Malloch) (Australia): 1. lateral view of female abdomen; 2. lateral view of male terminalia; 3. lateral view of male hypandrium complex; 4. wing (♂).



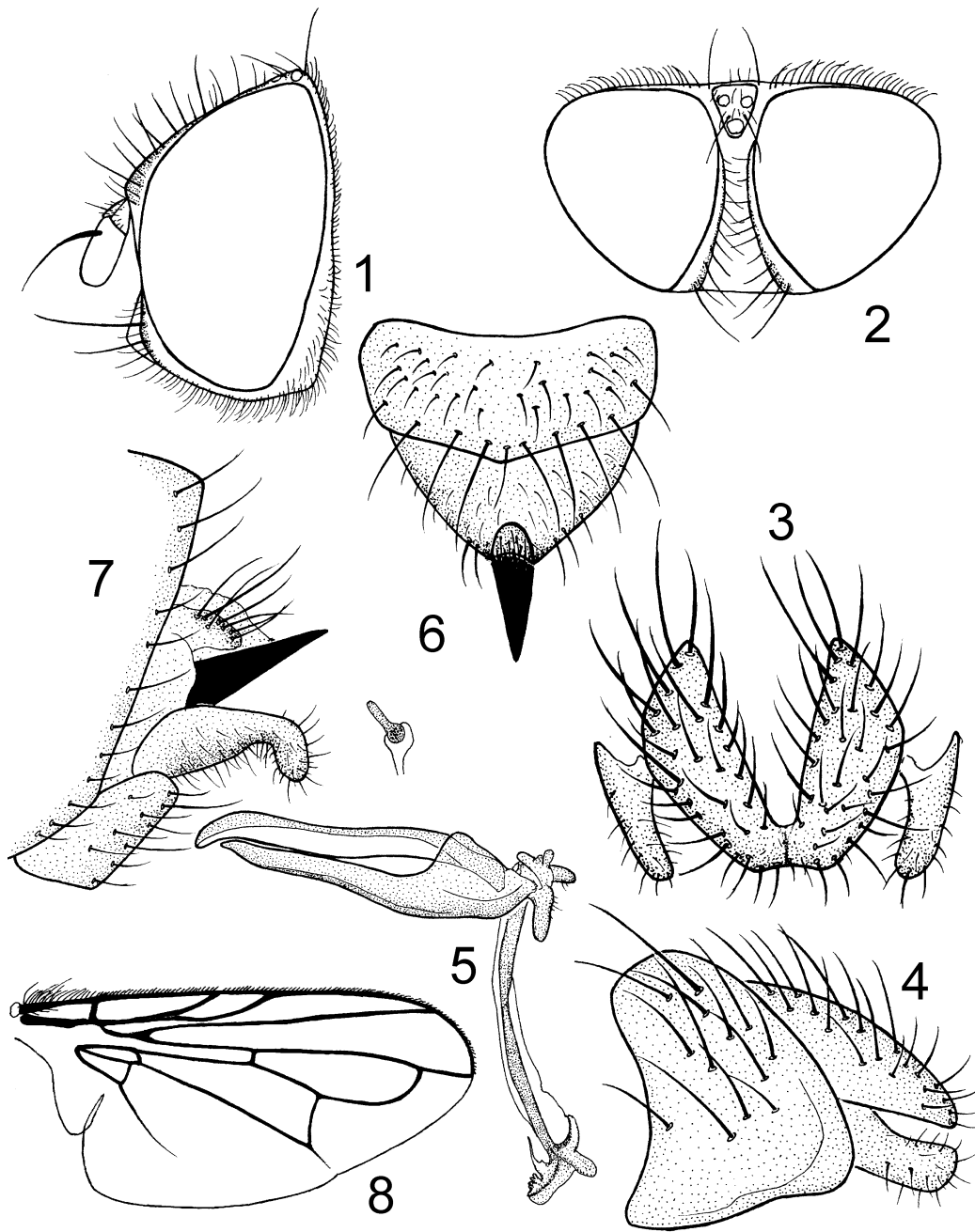
**FIGURE I-33.** *Phasia malaisei* Sun (Burma): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀).



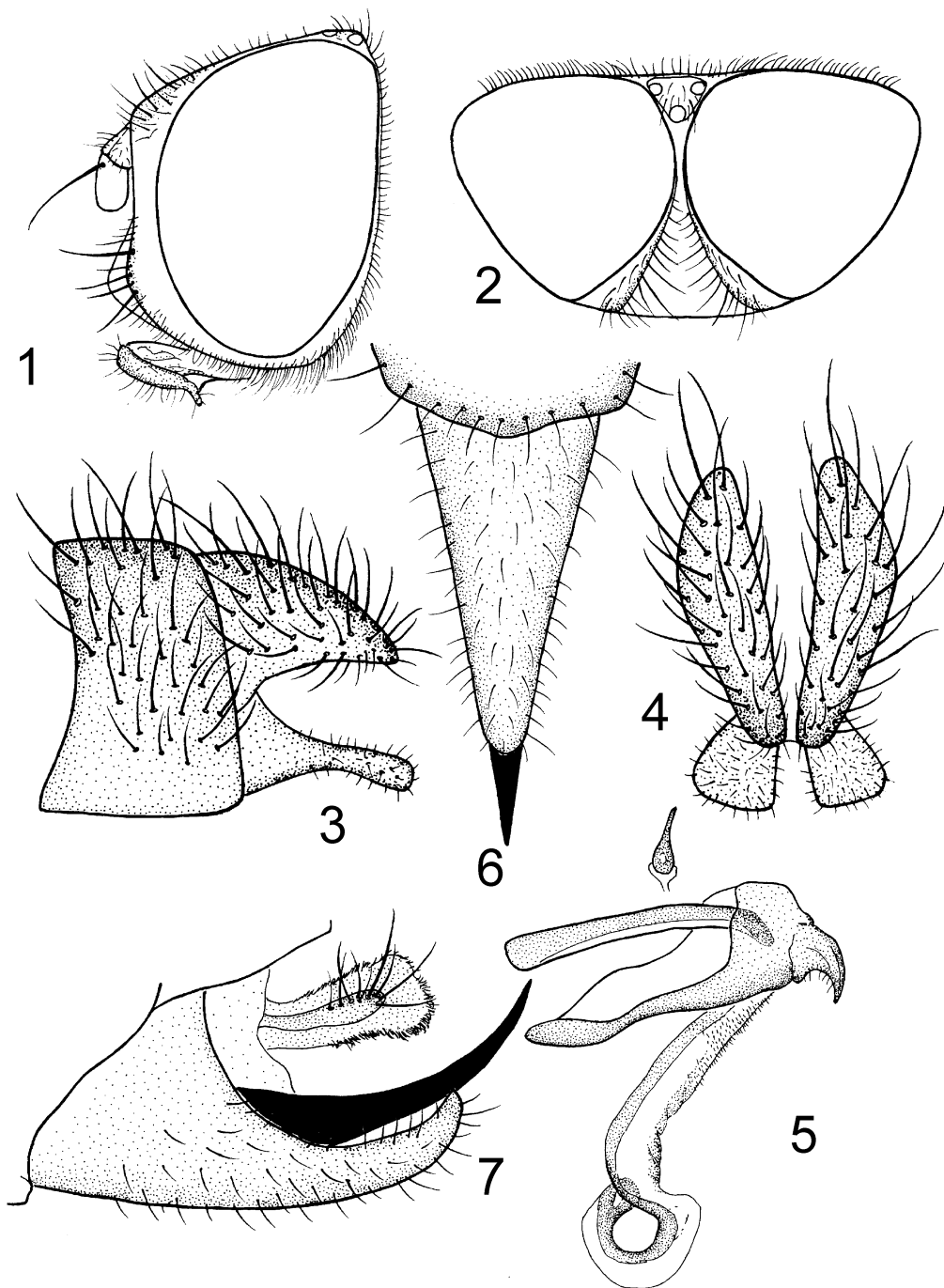
**FIGURE I-34.** 1-4. *Phasia mathisi* Sun : 1. head profile (♀, Kenya); 2. dorsal view of head (♀, Kenya); 3. lateral view of female terminalia (Seychelles); 4. ventral view of female terminalia (Seychelles). 5-8. *Phasia nigromaculata* Sun (South Africa): 5. head profile (♀); 6. ventral view of female terminalia. 7. dorsal view head (♀); 8. lateral view of female terminalia



**FIGURE I-35.** *Phasia mesnili* (Draber-Moňko): 1. head profile (♂, Tunisie); 2. dorsal view of head (♂?, Tunisie); 3. lateral view of male terminalia (Israel); 4. lateral view of male hypandrium complex (Israel); 5. posterior view of male terminalia (Israel); 6. ventral view of female terminalia (Turkey); 7. lateral view of female terminalia (Turkey); 8. wing (♂, Tunisie).

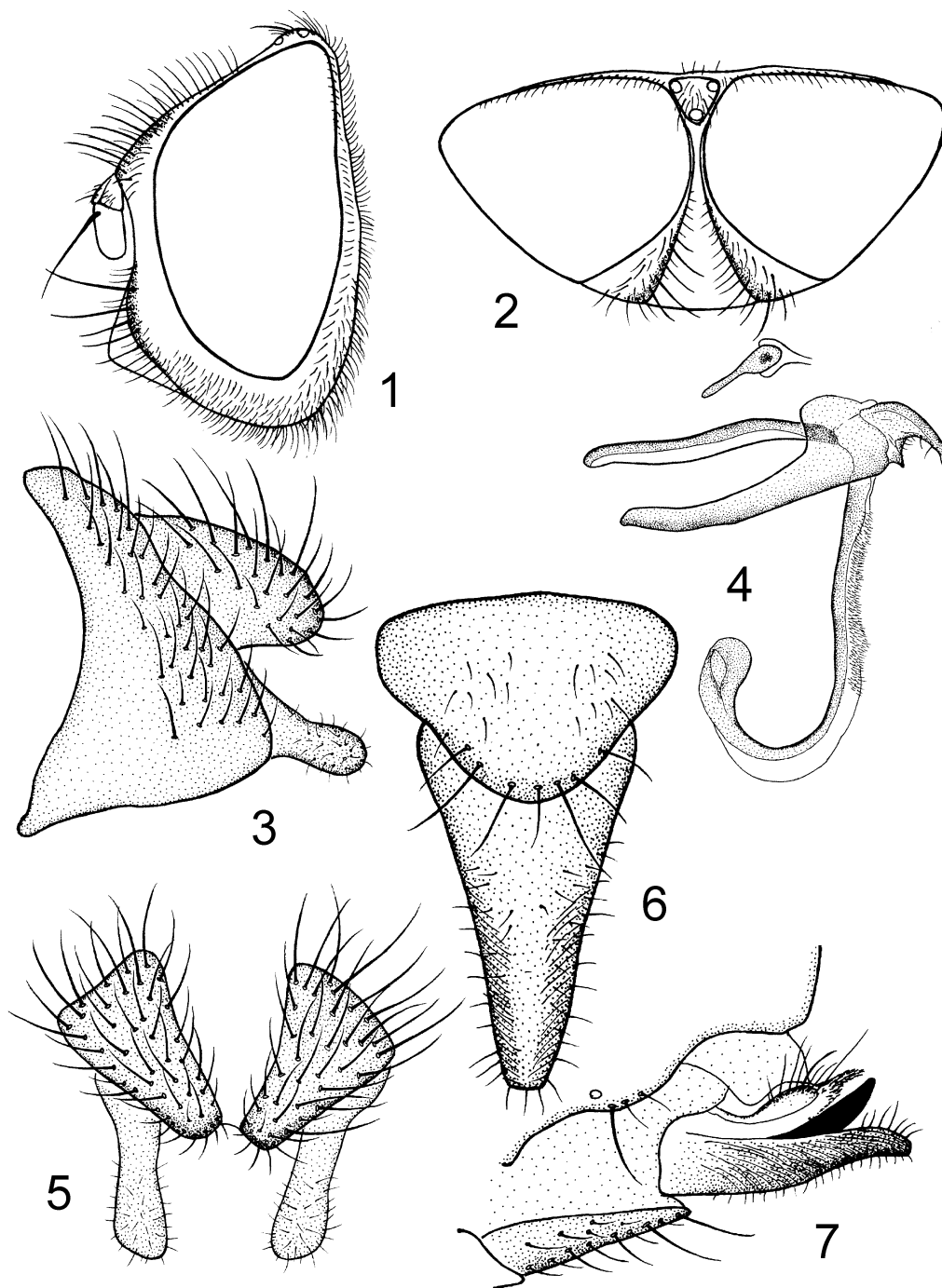


**FIGURE I-36.** *Phasia minima* Sun (Papua New Guinea): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. posterior view of male terminalia. 4. lateral view of male terminalia; 5. lateral view of male hypandrium complex; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing ( $\sigma$ ).

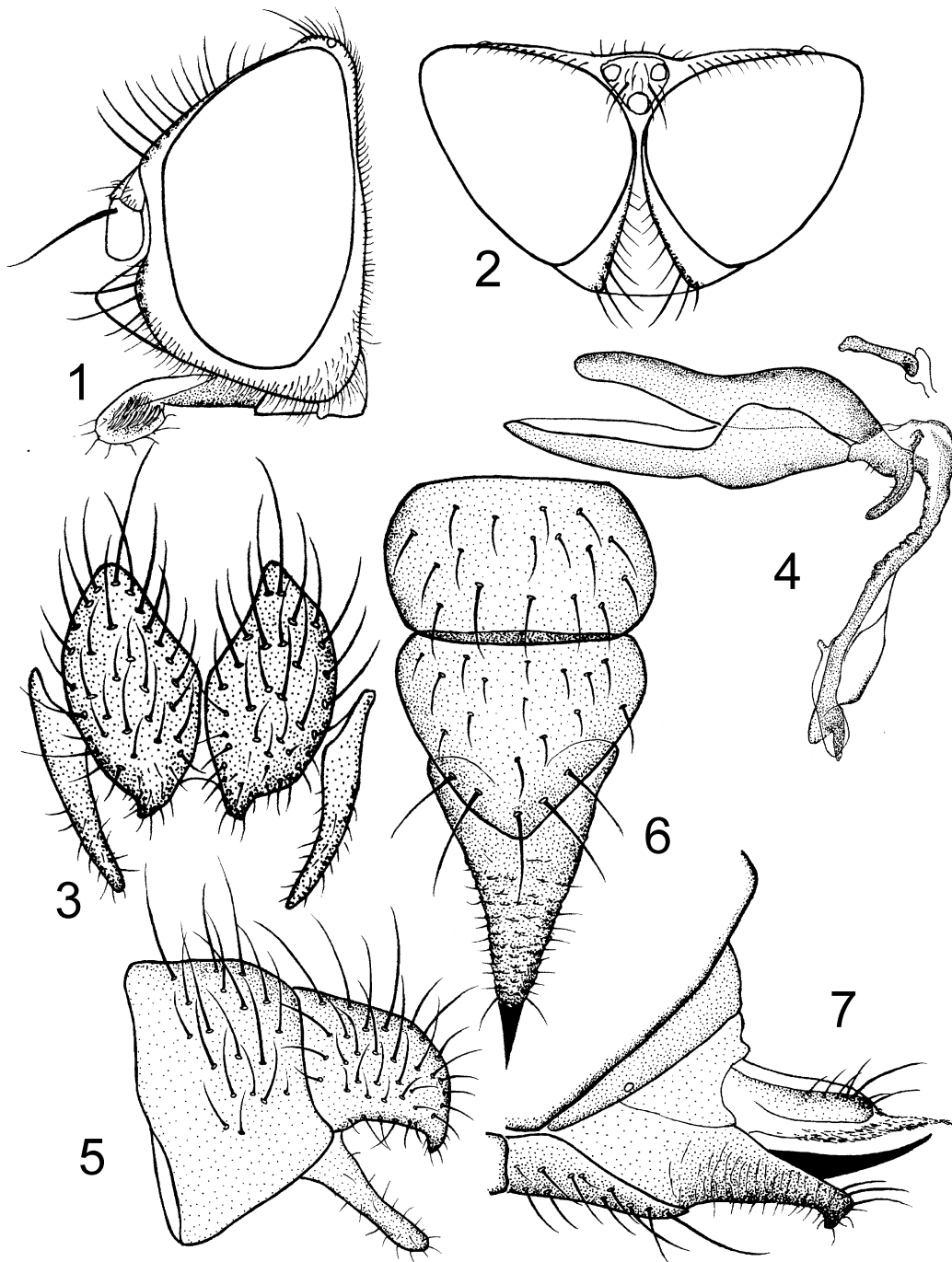


**FIGURE I-37.** *Phasia multisetosa* (Villeneuve) (Tanzania): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of male terminalia; 4. posterior view of male terminalia; 5. lateral view of male hypandrium complex; 6. ventral view of female terminalia; 7. lateral view of female terminalia.

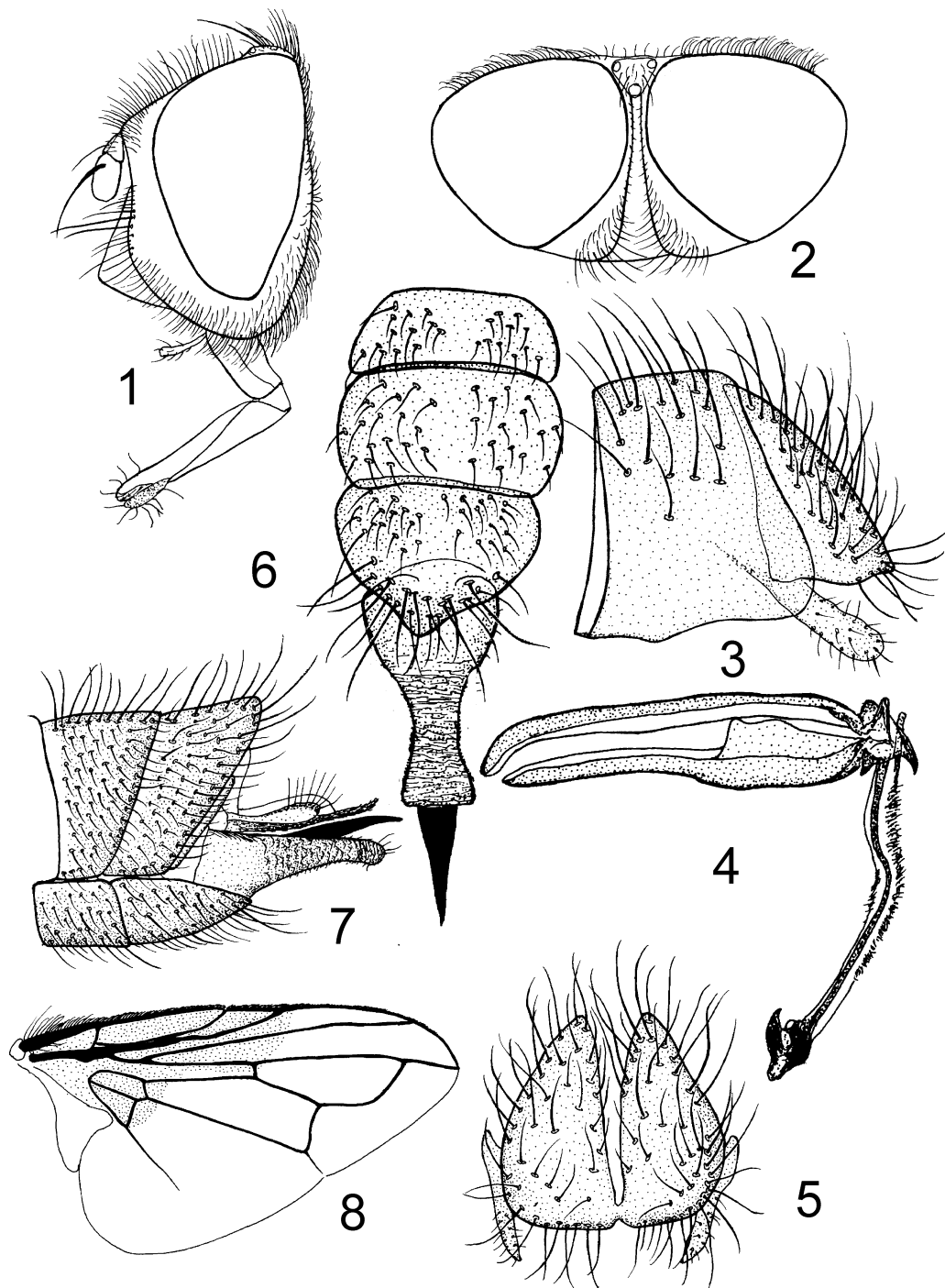




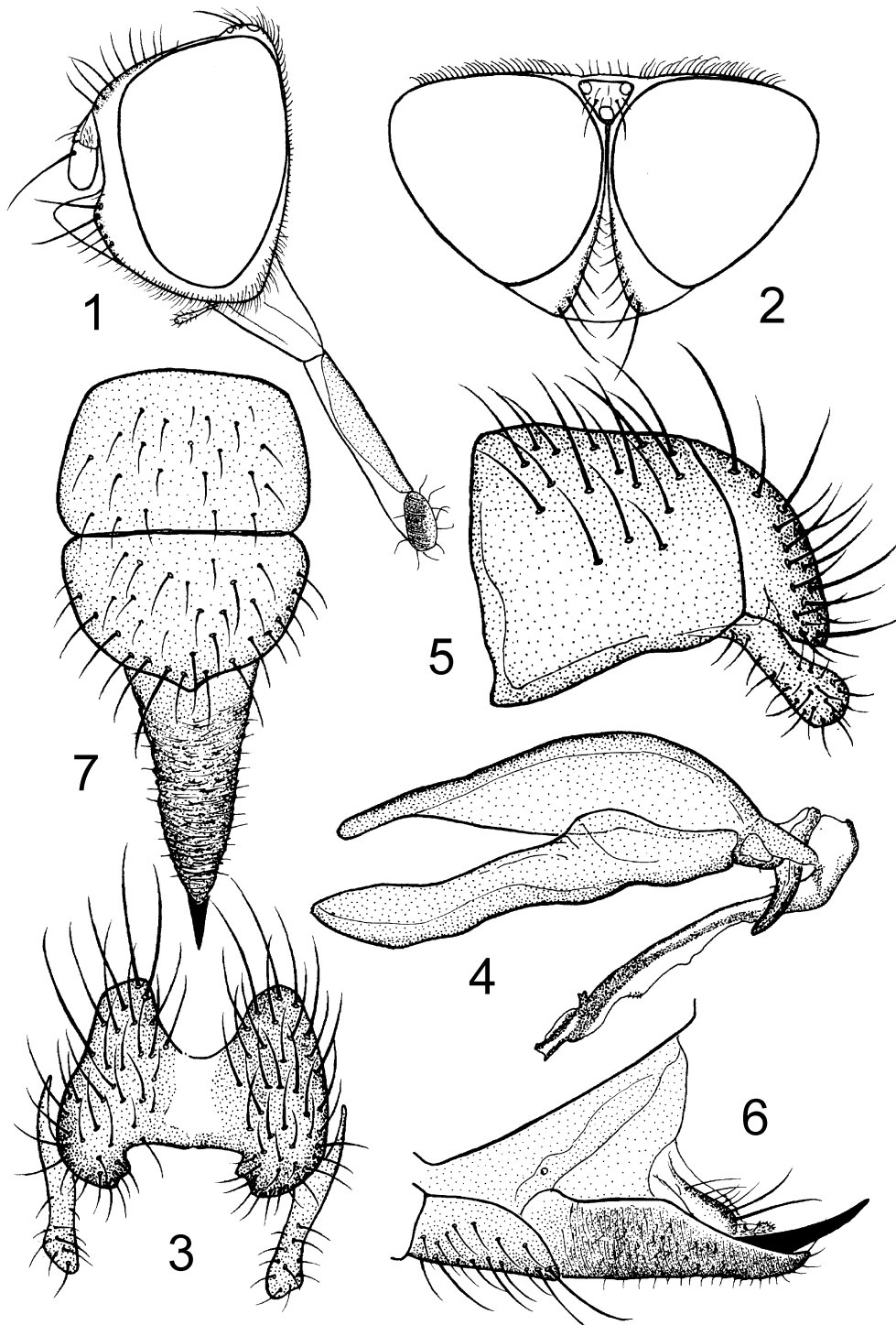
**FIGURE I-38.** *Phasia nasalis* (Bezzi) (South Africa): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male terminalia; 4. lateral view of male hypandrium complex; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia.



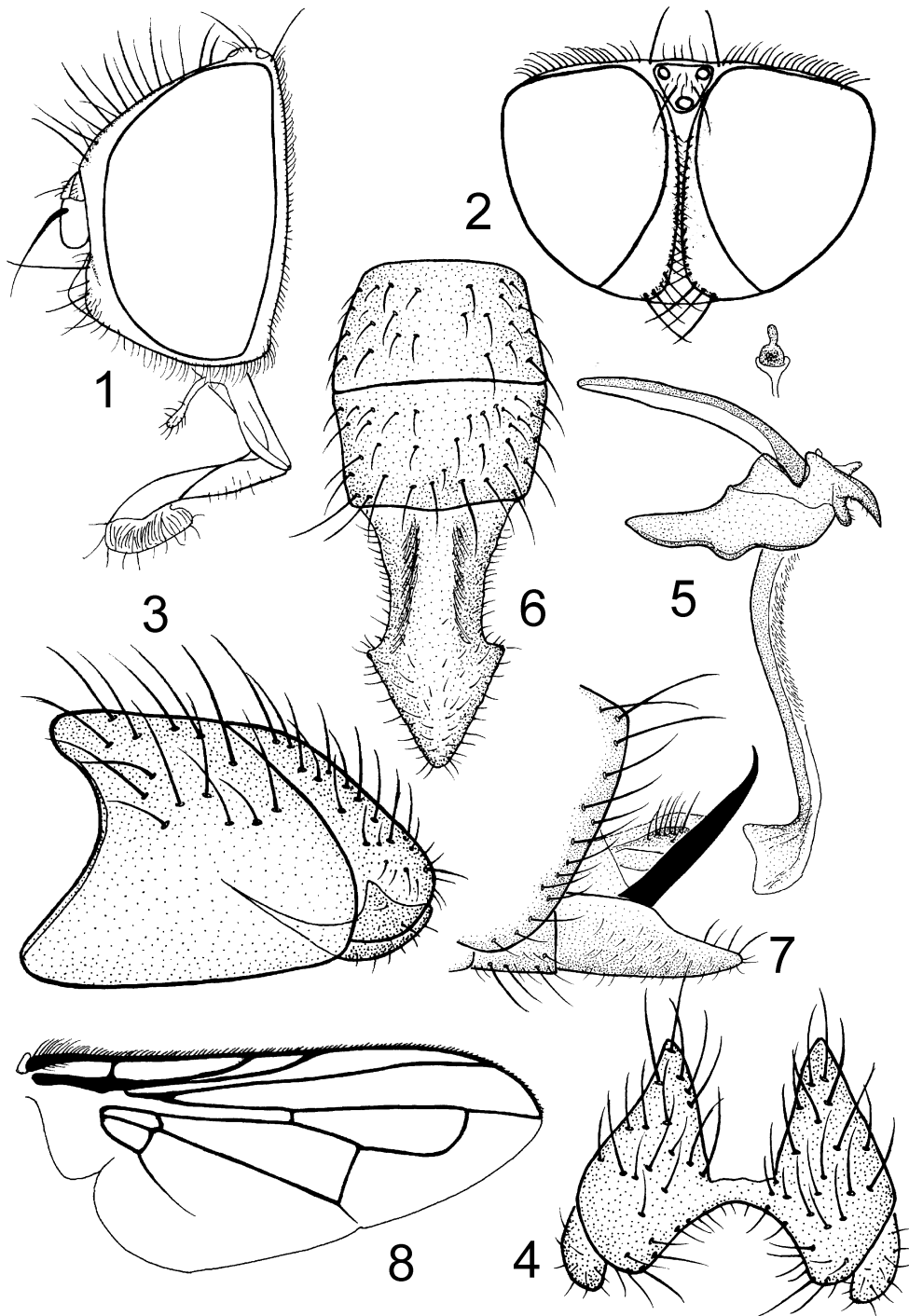
**FIGURE I-39.** *Phasia nasuta* (Loew) : 1. head profile ( $\sigma$ , South Africa); 2. dorsal view of head ( $\sigma$ , South Africa); 3. posterior view of male terminalia (Zimbabwe); 4. lateral view male hypandrium complex (Zimbabwe); 5. lateral view of male terminalia (South Africa); 6. ventral view of female terminalia (Burundi); 7. lateral view of female terminalia (Burundi).



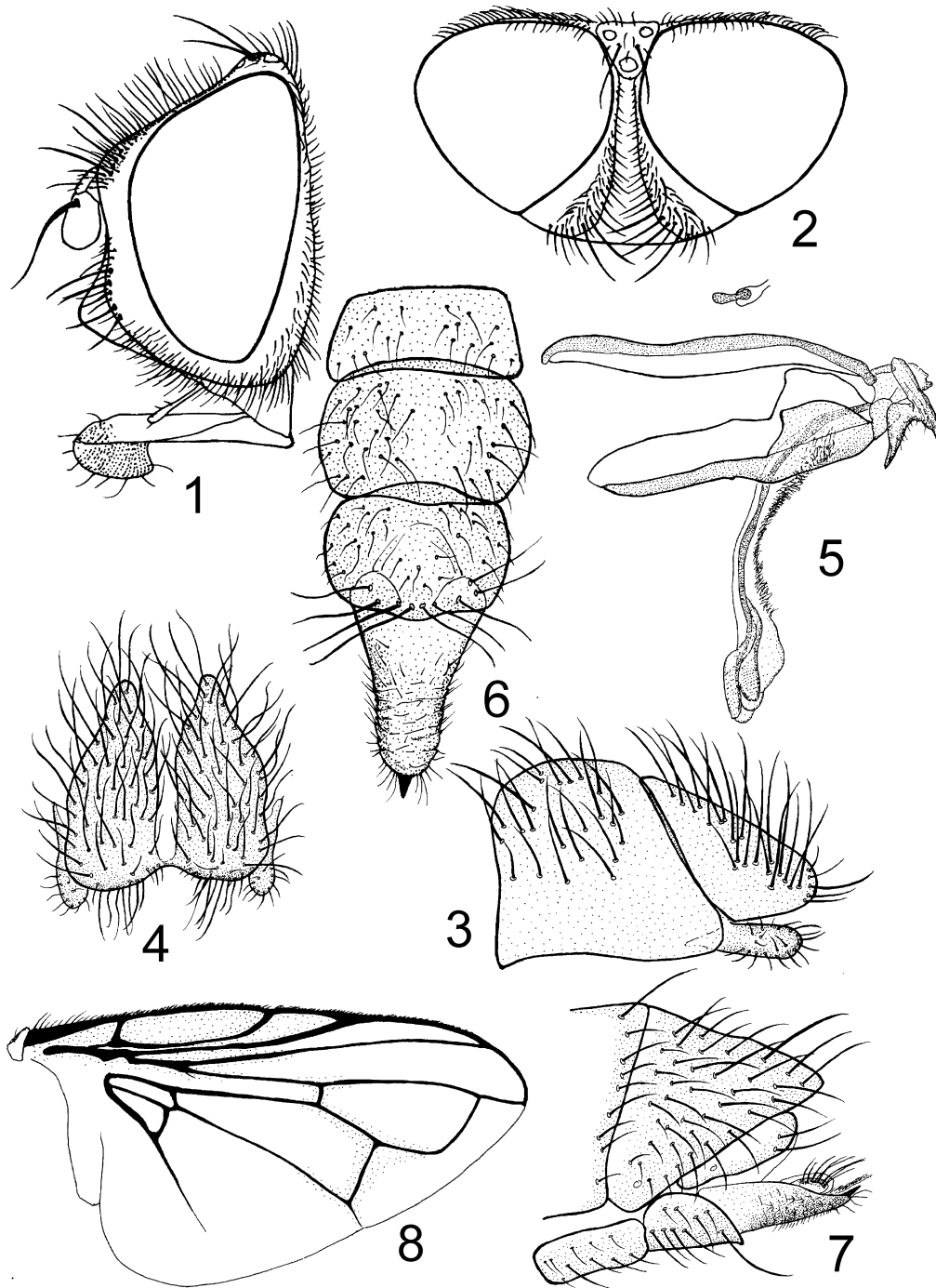
**FIGURE I-40.** *Phasia nigrens* (Wulp) : 1. head profile ( $\sigma$ , USA, TX); 2. dorsal view of head ( $\sigma$ , USA, TX); 3. lateral view of male terminalia (USA, TX); 4. lateral view of male hypandrium complex (USA, TX); 5. posterior view of male terminalia (USA, TX); 6. ventral view of female terminalia (Mexico); 7. lateral view of female terminalia (Mexico); 8. wing ( $\sigma$ , USA, TX).



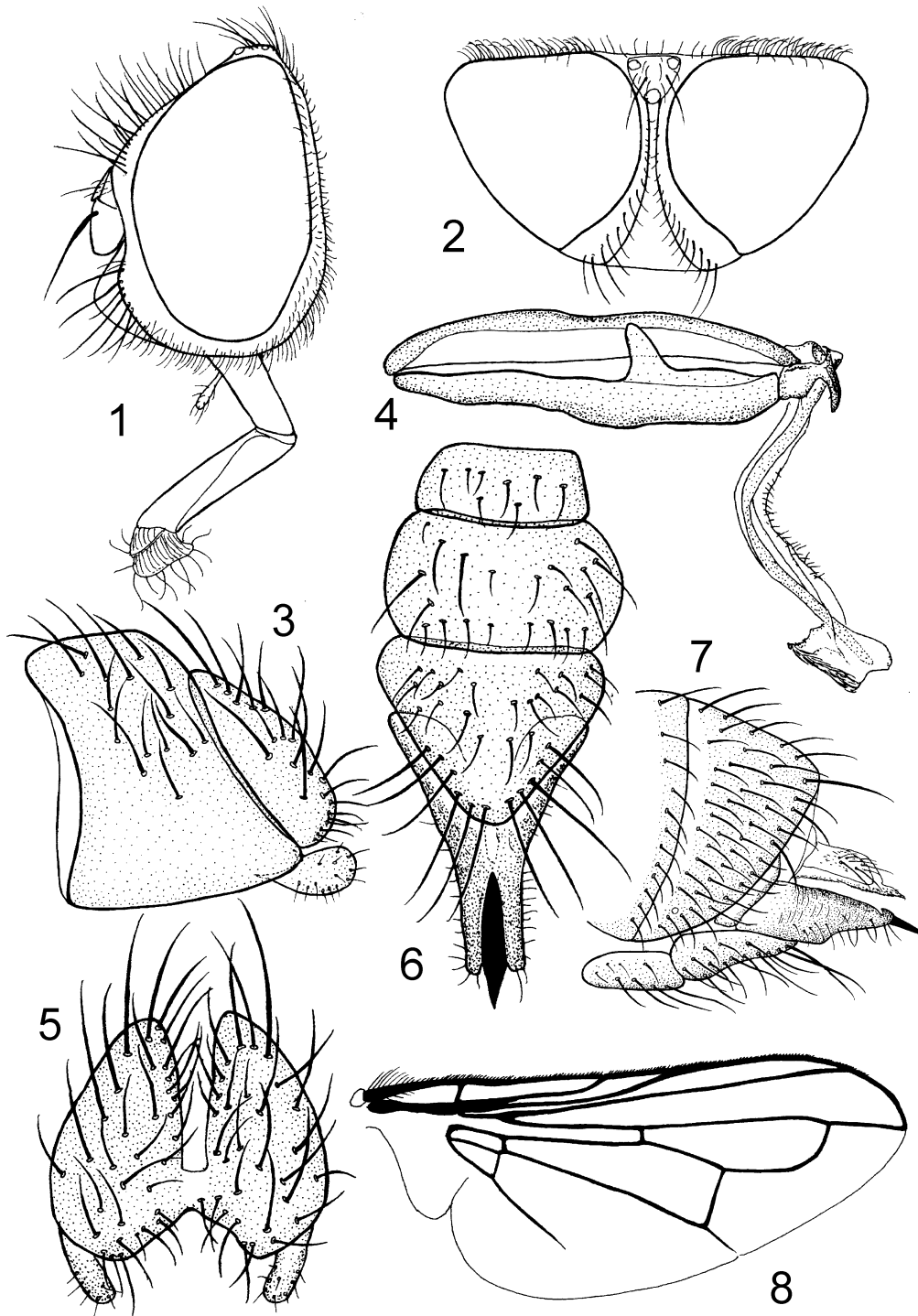
**FIGURE I-41.** *Phasia nigrofimbriata* (Villeneuve) (South Africa): 1. head profile (♀); 2. dorsal view of head (♀); 3. posterior view of male terminalia; 4. lateral view male hypandrium complex; 5. lateral view male terminalia. 6. ventral view female terminalia; 7. lateral view of female terminalia.



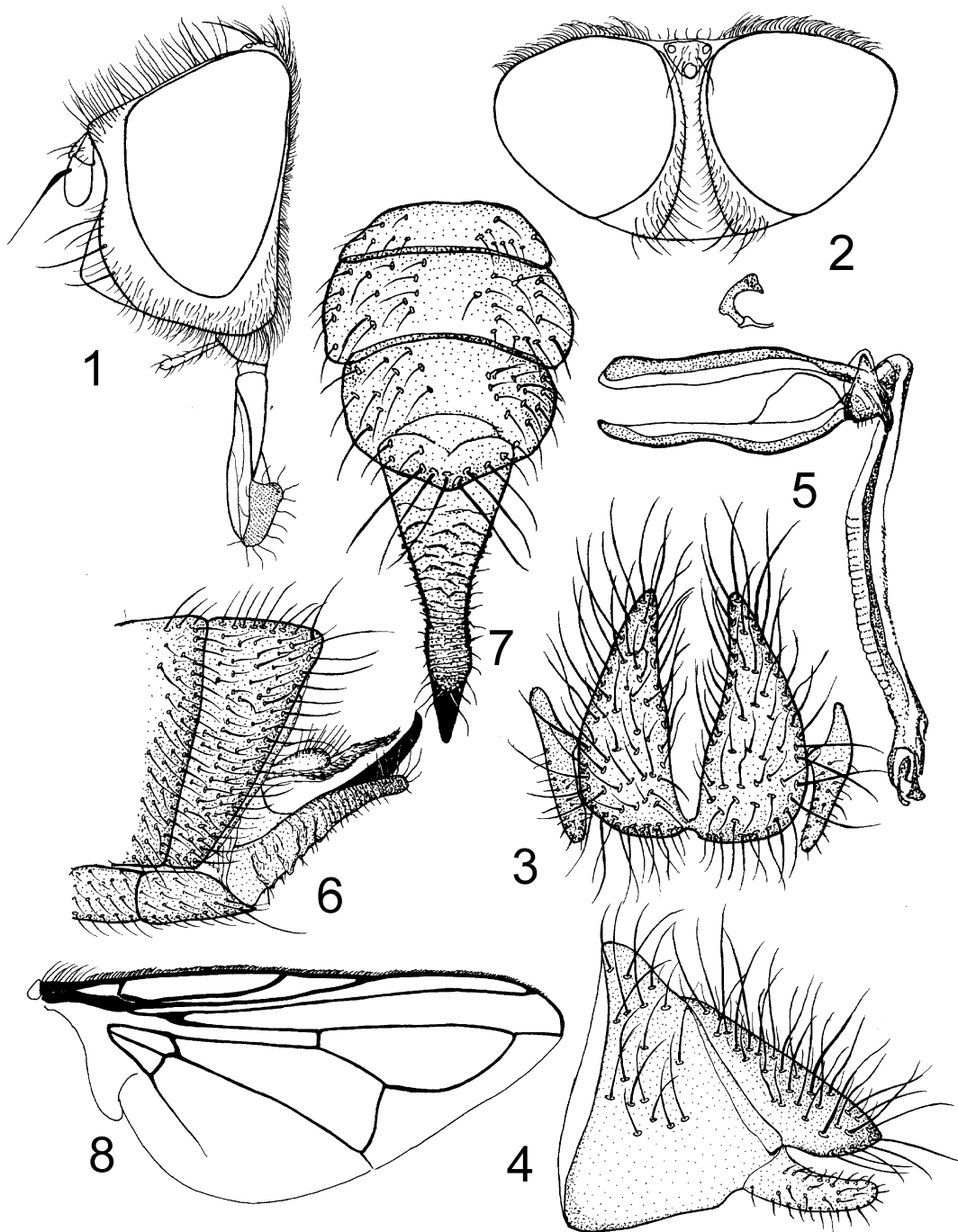
**FIGURE I-42.** *Phasia normalis* (Curran) (Australia): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male terminalia; 4. posterior view of male terminalia; 5. lateral view of male hypandrium complex; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing ( $\sigma$ ).



**FIGURE I-43.** *Phasia obesa* (Fabricius): 1. head profile ( $\sigma$ , Switzerland); 2. dorsal view of head ( $\sigma$ , Switzerland); 3. lateral view of male terminalia (Lebanon); 4. posterior view of male terminalia (Lebanon); 5. lateral view of male hypandrium complex (Lebanon); 6. ventral view of female terminalia (Lebanon); 7. lateral view of female terminalia (Lebanon); 8. wing ( $\sigma$ , Switzerland).

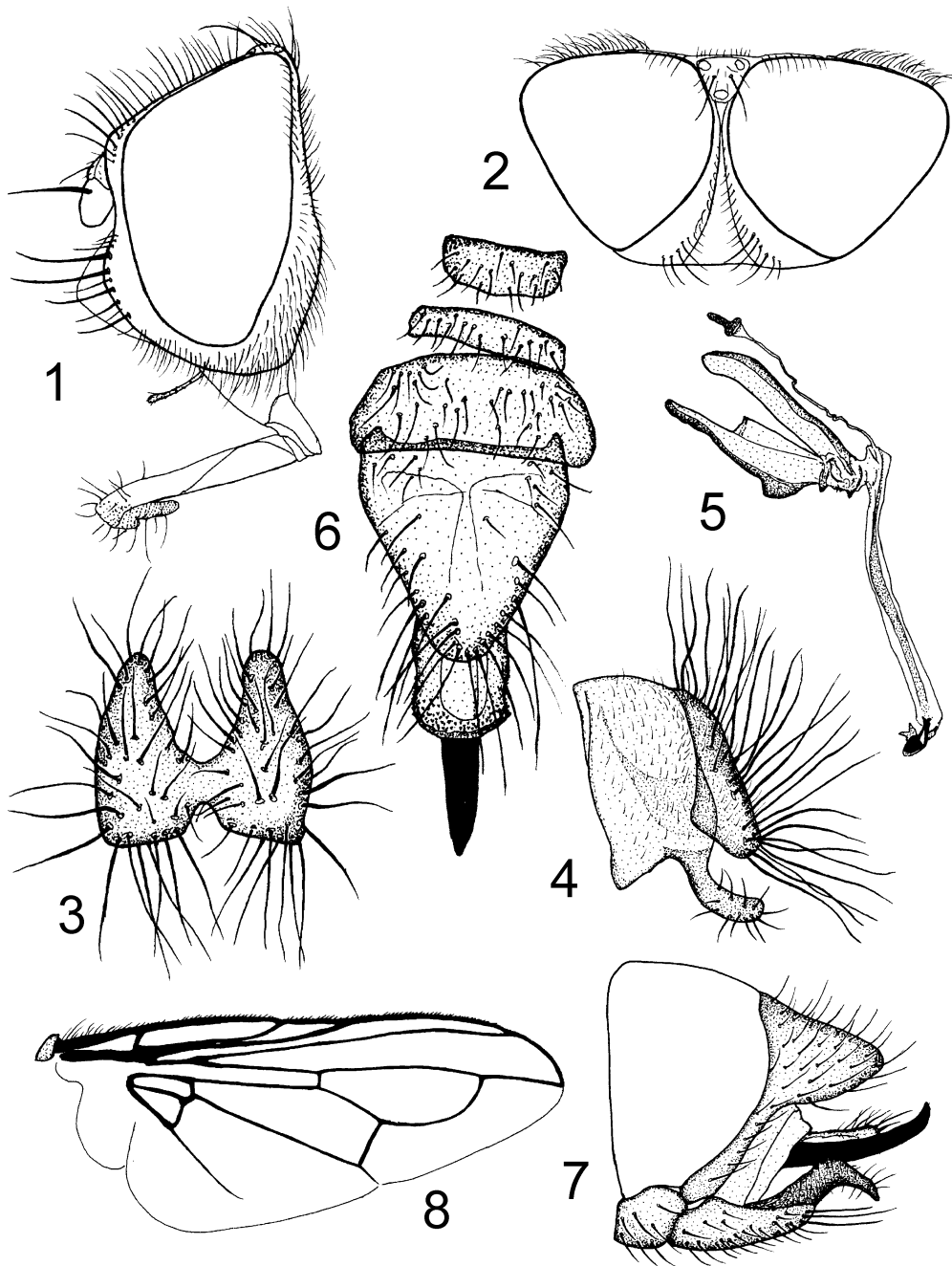


**FIGURE I-44.** *Phasia pandellei* (Dupuis): 1. head profile (♀, Greece); 2. dorsal view of head (♀, Greece); 3. lateral view of male terminalia (Germany); 4. lateral view of male hypandrium complex (Germany); 5. posterior view of male terminalia (Germany); 6. ventral view of female terminalia (Germany); 7. lateral view of female terminalia (Germany); 8. wing (♀, Greece).

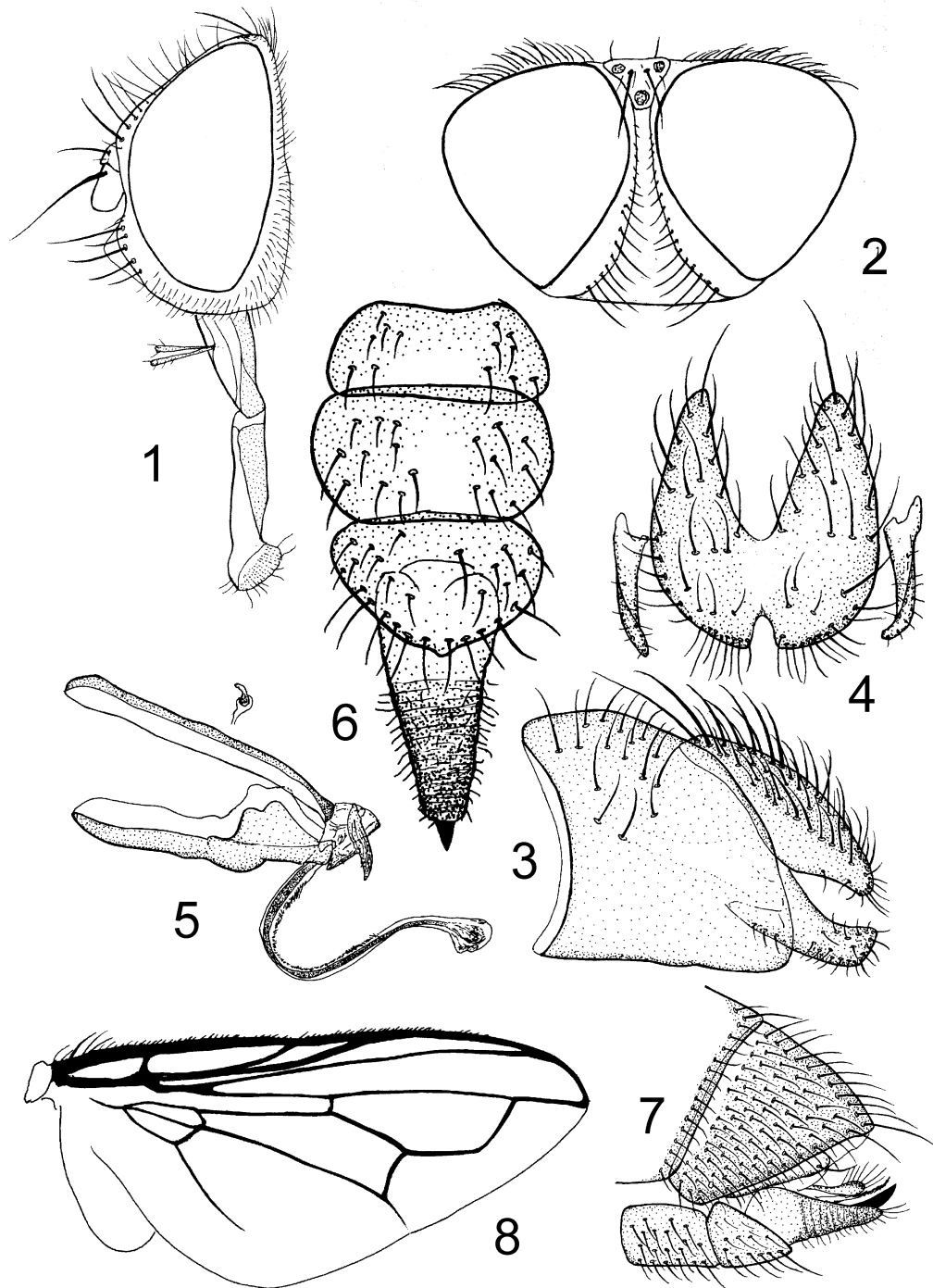


**FIGURE I-45.** *Phasia piceipes* (Wulp) (Mexico): 1. head profile (♂); 2. dorsal view of head (♂); 3. posterior view of male terminalia; 4. lateral view of male terminalia; 5. lateral view of male hypandrium complex; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing (♂).

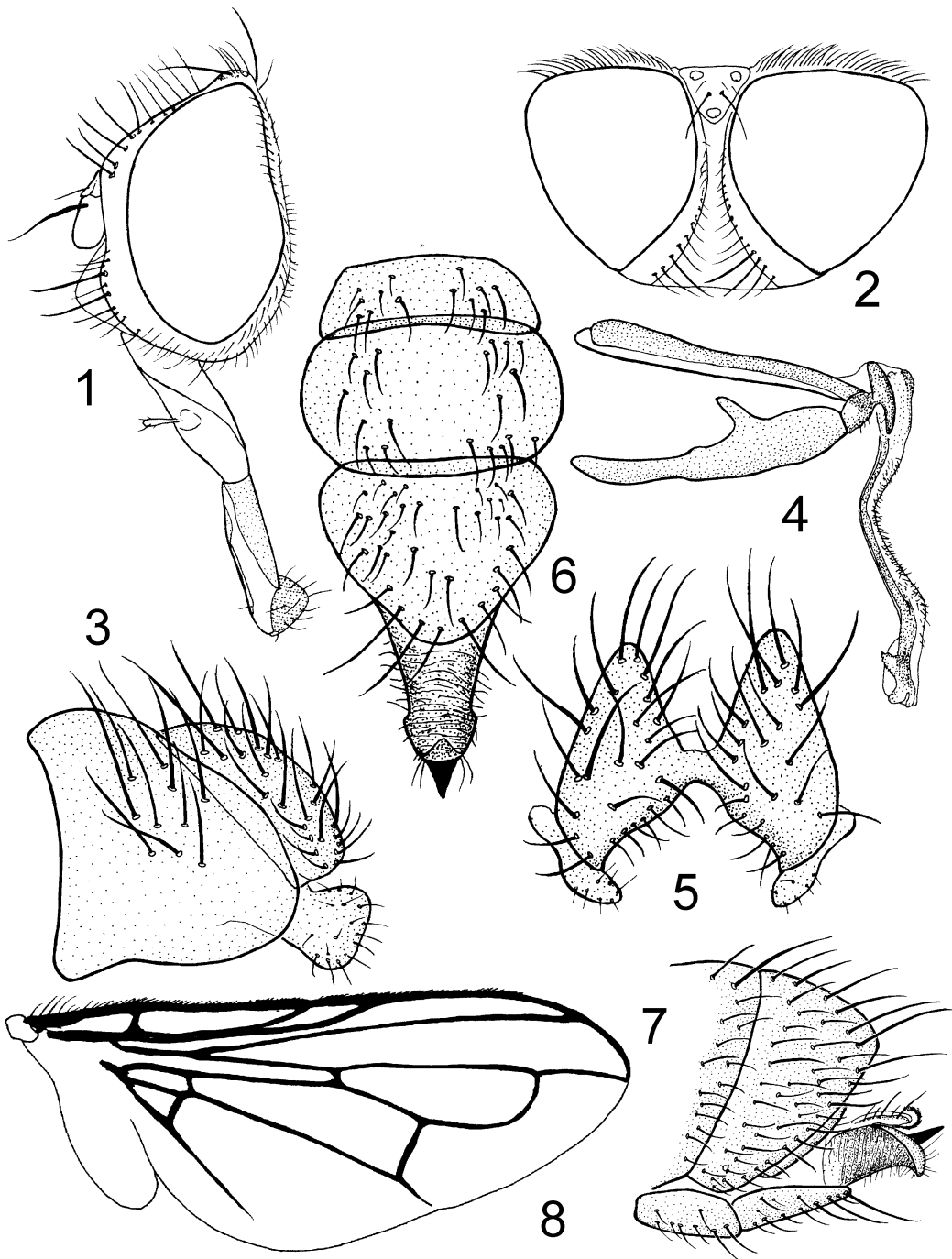




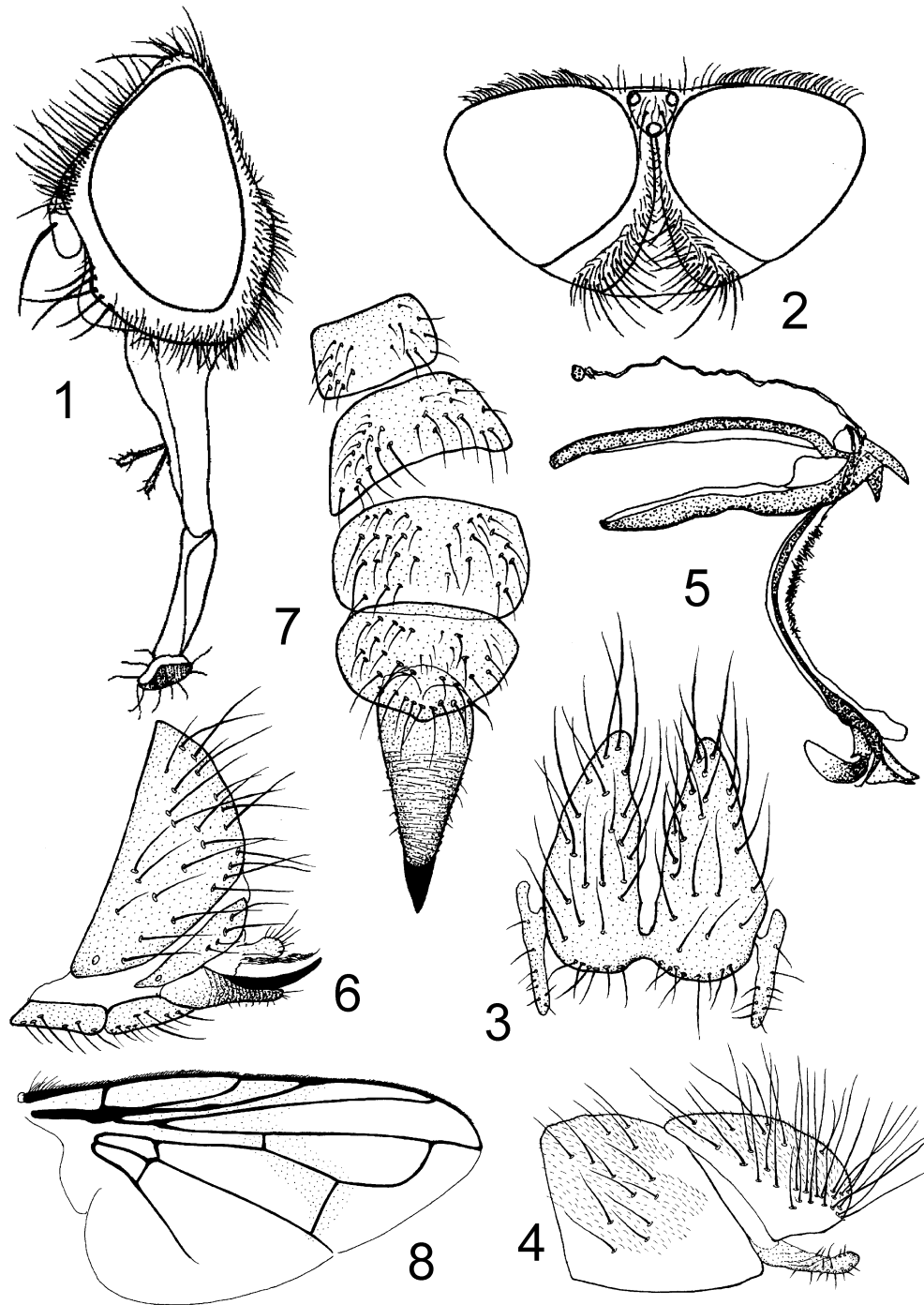
**FIGURE I-46.** *Phasia punctigera* (Townsend) (USA, TX): 1. head profile (♂); 2. dorsal view of head (♂); 3. posterior view of male terminalia; 4. lateral view of male terminalia; 5. lateral view of male hypandrium complex; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing (♂).



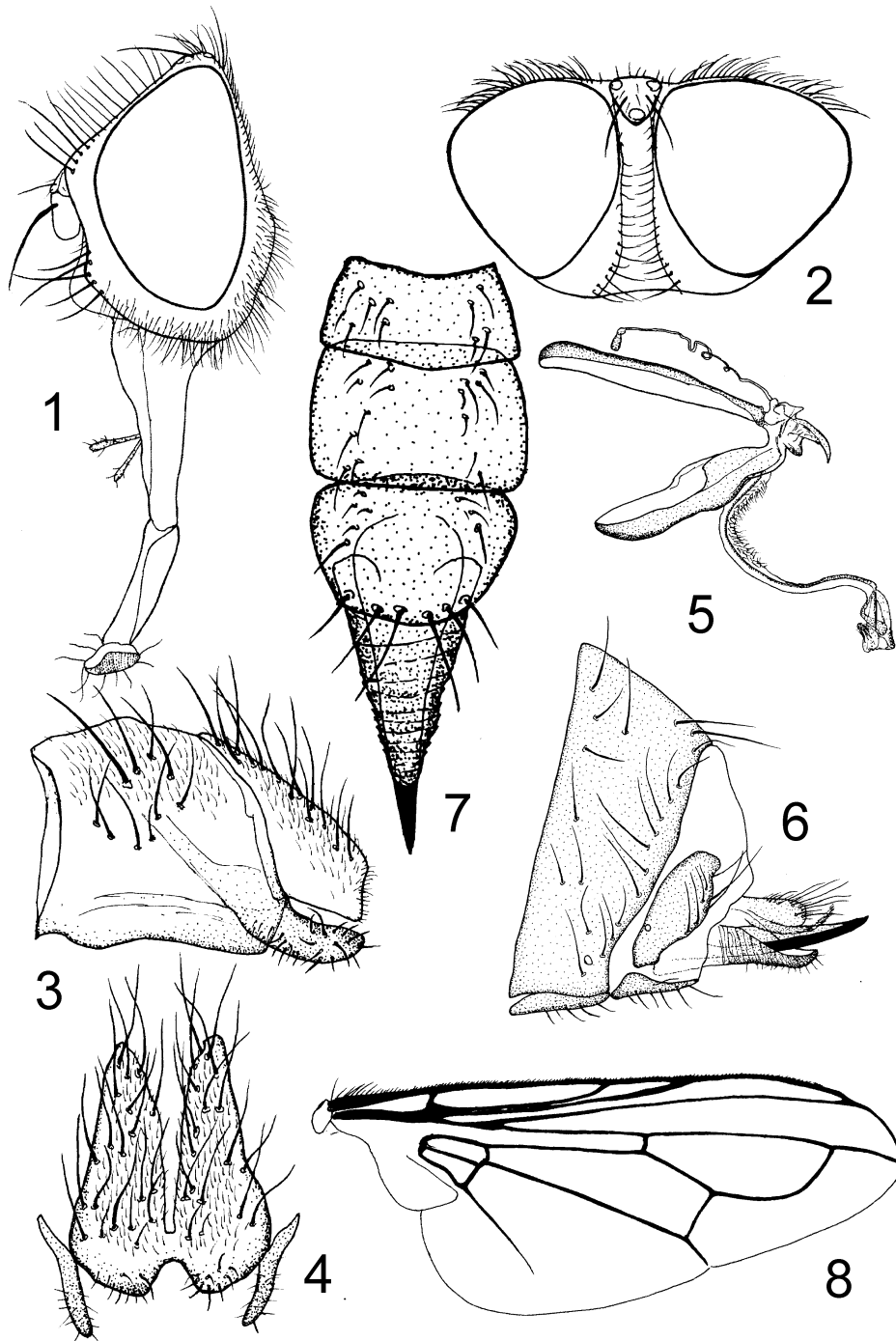
**FIGURE I-47.** *Phasia purpurascens* (Townsend) (USA): 1. head profile ( $\sigma$ , MD); 2. dorsal view of head ( $\sigma$ , MD); 3. lateral view of male terminalia (TN); 4. posterior view of male terminalia (TN); 5. lateral view of male hypandrium complex (TN); 6. ventral view of female terminalia (TX); 7. lateral view of female terminalia (TX); 8. wing ( $\sigma$ , MD).



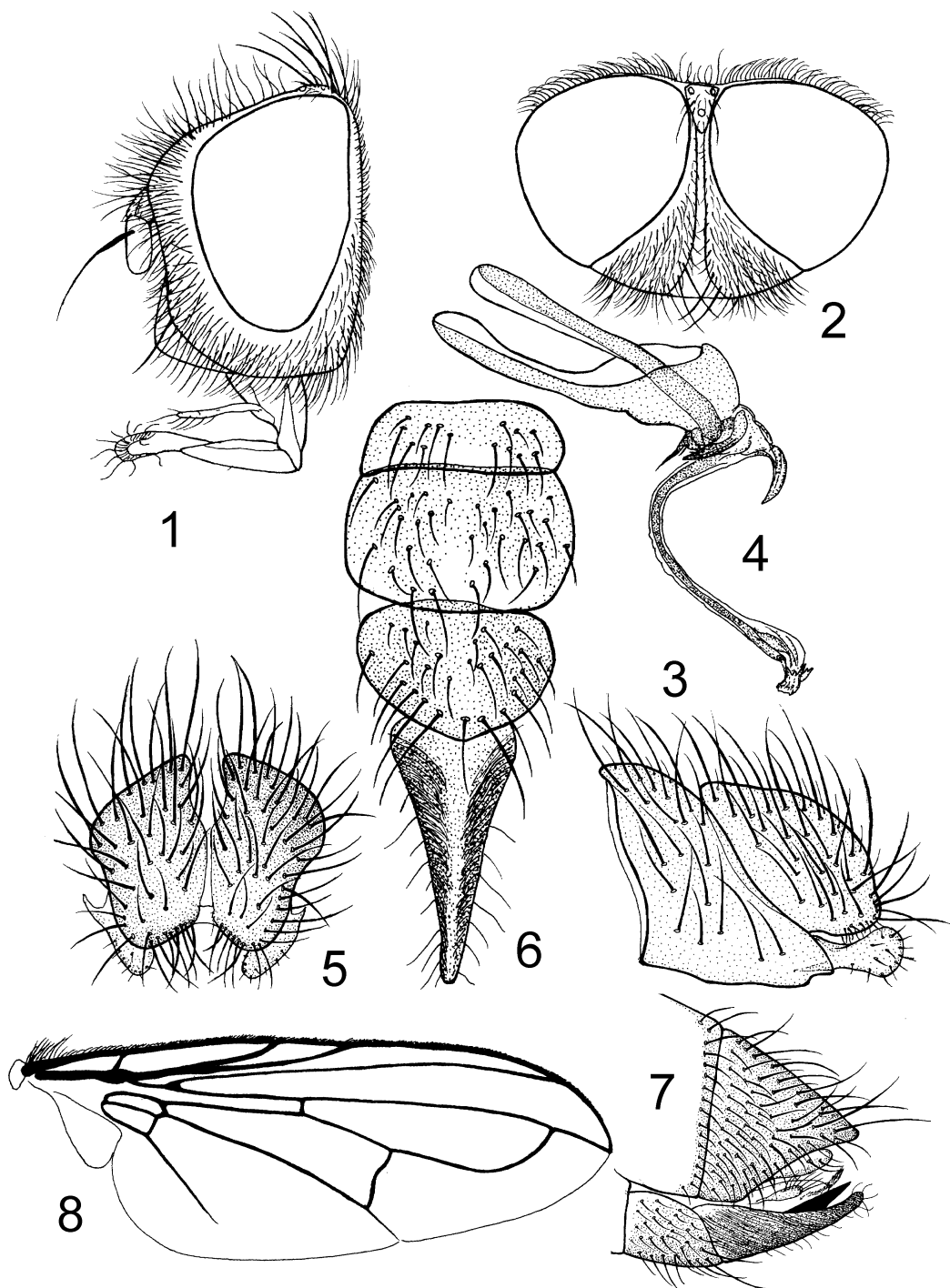
**FIGURE I-48.** *Phasia pusilla* Meigen (Russia): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male terminalia; 4. lateral view of male hypandrium complex; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing (♂).



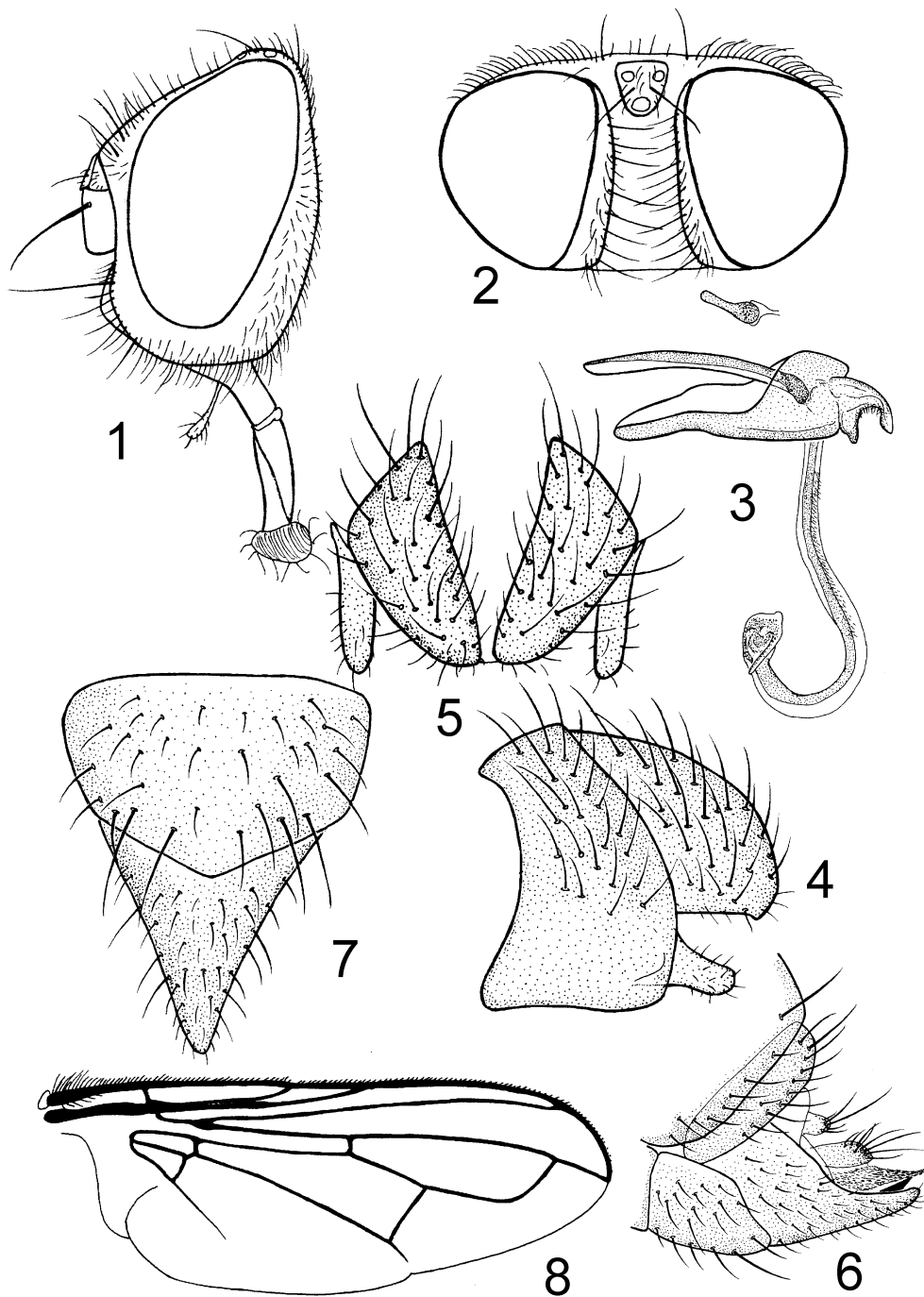
**FIGURE I-49.** *Phasia robertsonii* (Townsend): 1. head profile ( $\sigma$ , USA, OH); 2. dorsal view of head ( $\sigma$ , USA, OH); 3. posterior view of male terminalia (Canada, QUE); 4. lateral view of male terminalia (Canada, QUE); 5. lateral view of male hypandrium complex (Canada, QUE); 6. lateral view of female terminalia (Canada, QUE); 7. ventral view of female terminalia (Canada, QUE); 8. wing ( $\sigma$ , USA, OH).



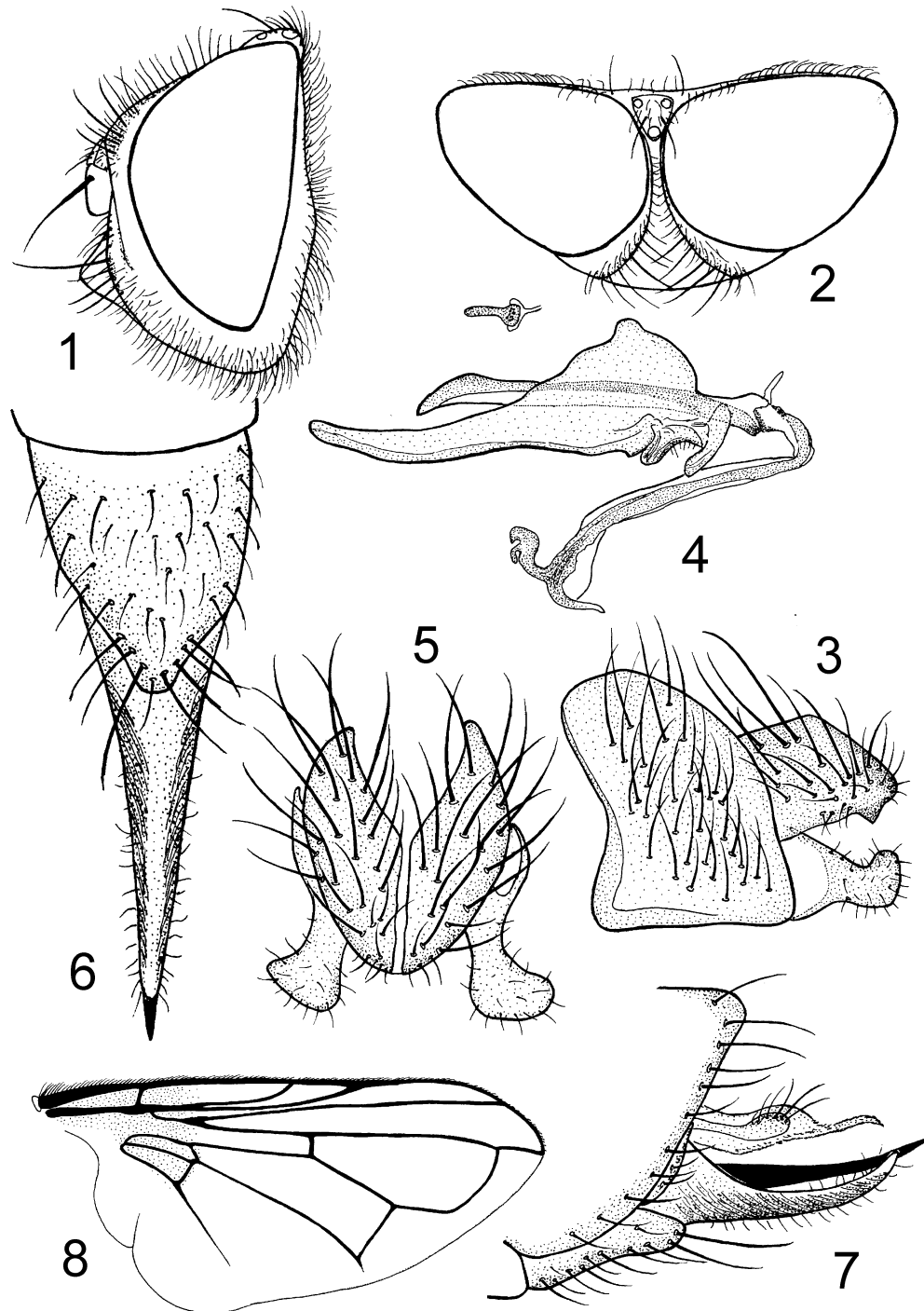
**FIGURE I-50.** *Phasia robusta* (Brooks)(USA): 1. head profile (♂, CO); 2. dorsal view of head (♂, CO); 3. lateral view of male terminalia (TX); 4. posterior view of male terminalia (TX); 5. lateral view of male hypandrium complex (TX); 6. lateral view of female terminalia (CO); 7. ventral view of female terminalia (CO); 8. wing (♂, CO).



**FIGURE I-51.** *Phasia rohdendorfi* (Draber-Moňko) (China, Sichuan): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of male terminalia; 4. lateral view of male hypandrium complex; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing (♀).

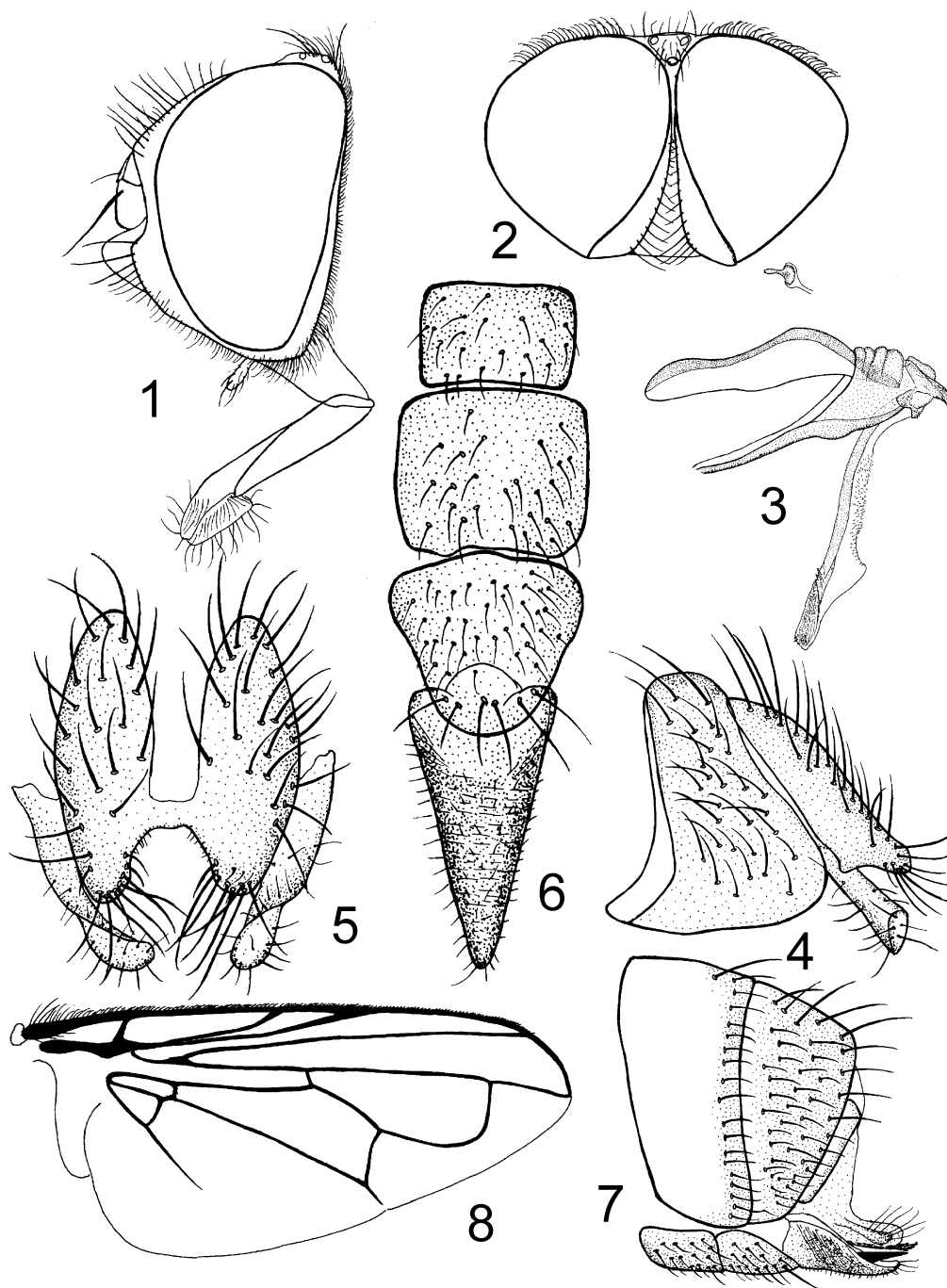


**FIGURE I-52.** *Phasia rotundata* Sun (Australia): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male hypandrium complex; 4. lateral view of male terminalia; 5. posterior view of male terminalia; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing ( $\sigma$ ).

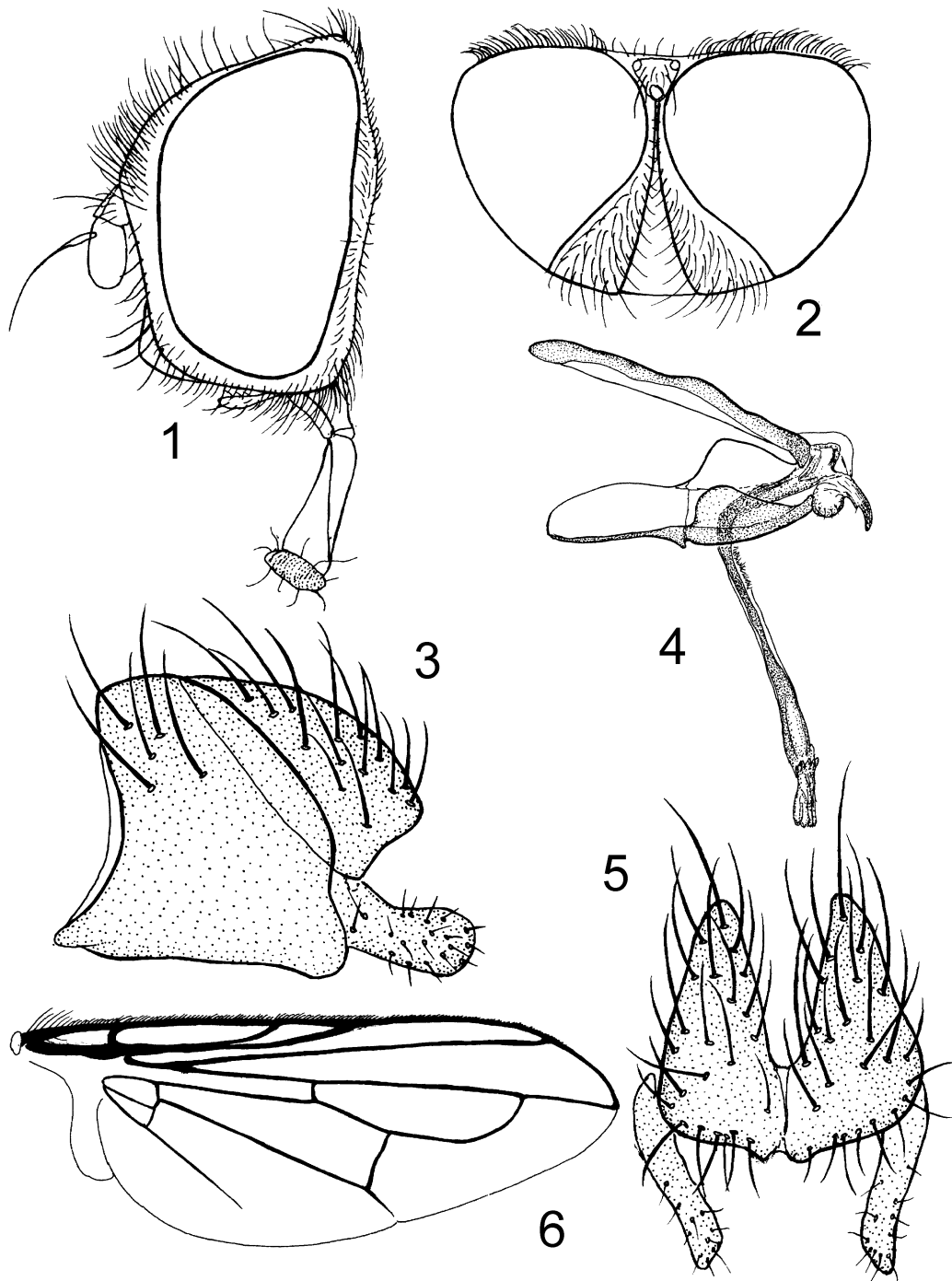


**FIGURE I-53.** *Phasia rufiventris* (Macquart) (Australia): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male terminalia; 4. lateral view of male hypandrium complex; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing ( $\sigma$ ).

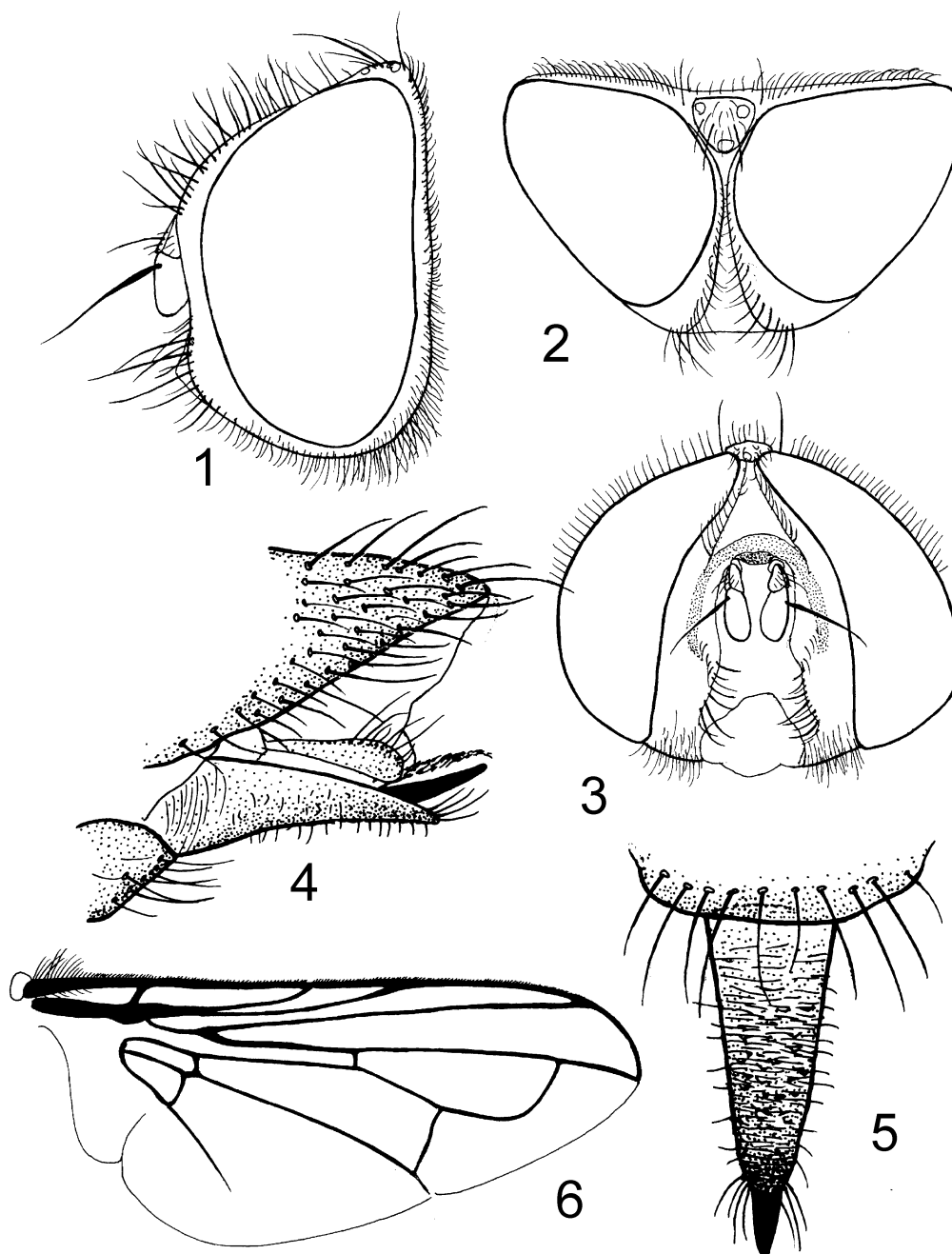




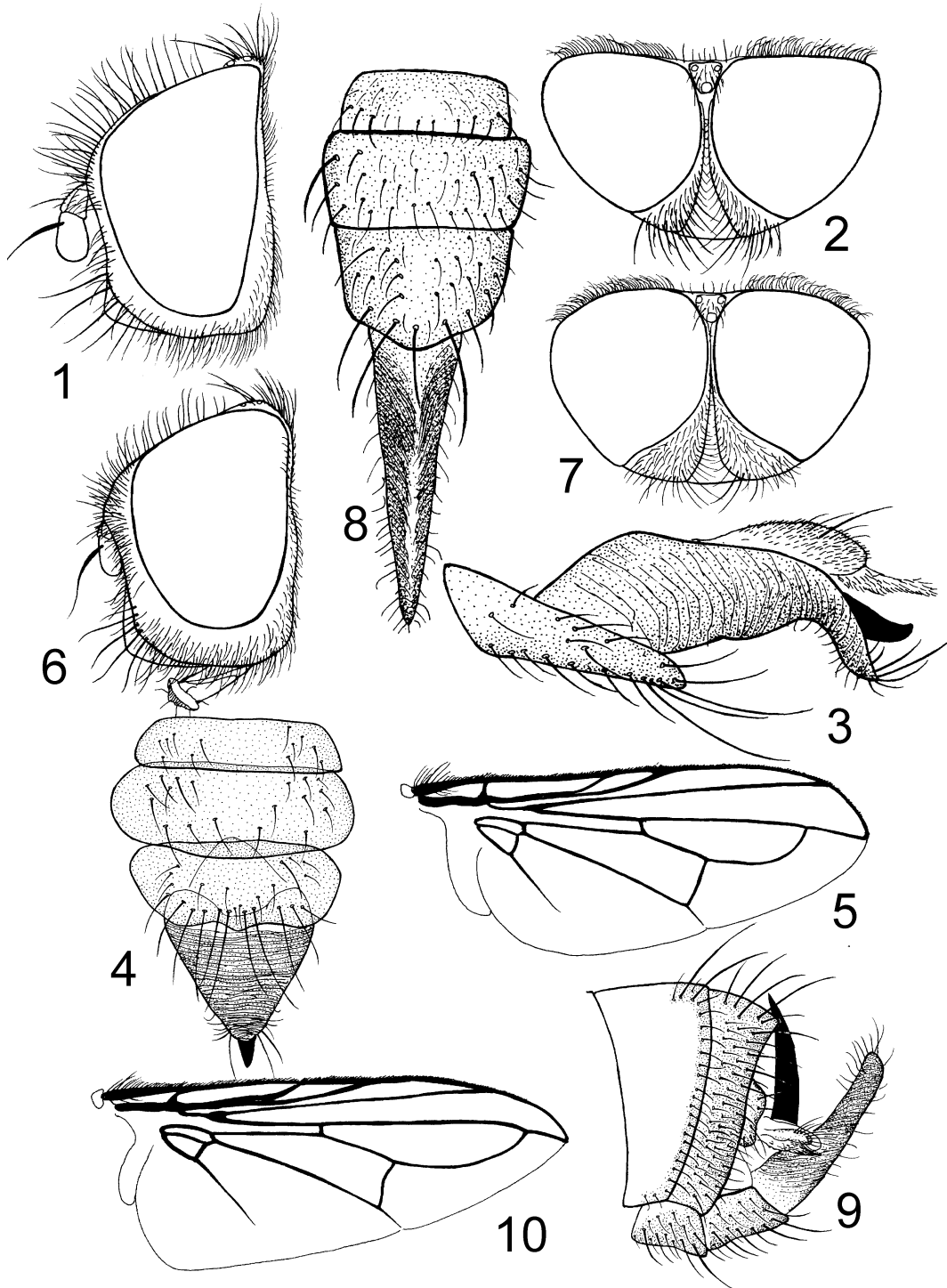
**FIGURE I-54.** *Phasia sensua* (Curran) (Australia): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male hypandrium complex; 4. lateral view of male terminalia; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing (♂).



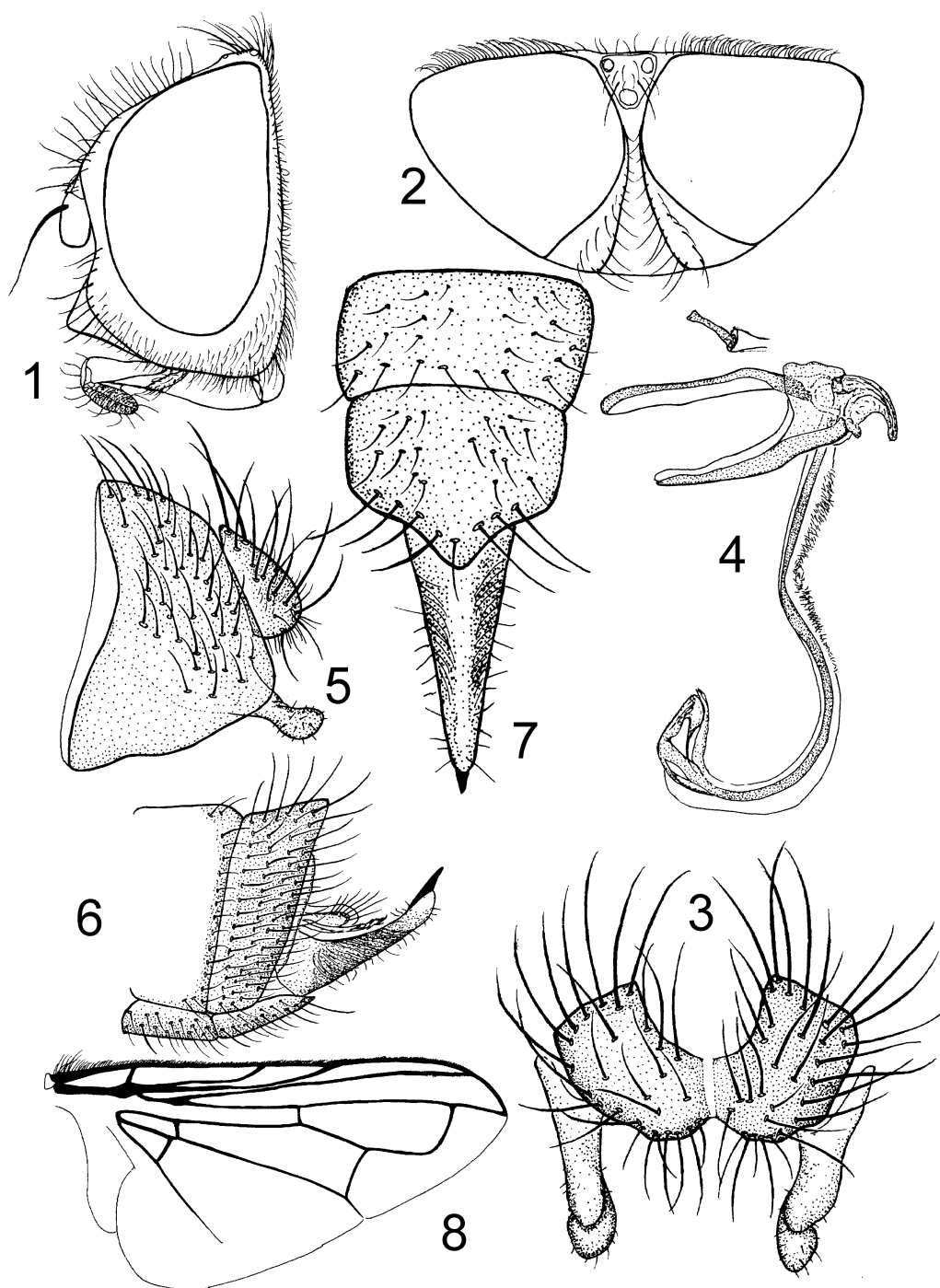
**FIGURE I-55.** *Phasia serrata* Sun (Philippines): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male terminalia; 4. lateral view of male hypandrium complex; 5. posterior view of male terminalia; 6. wing (♂).



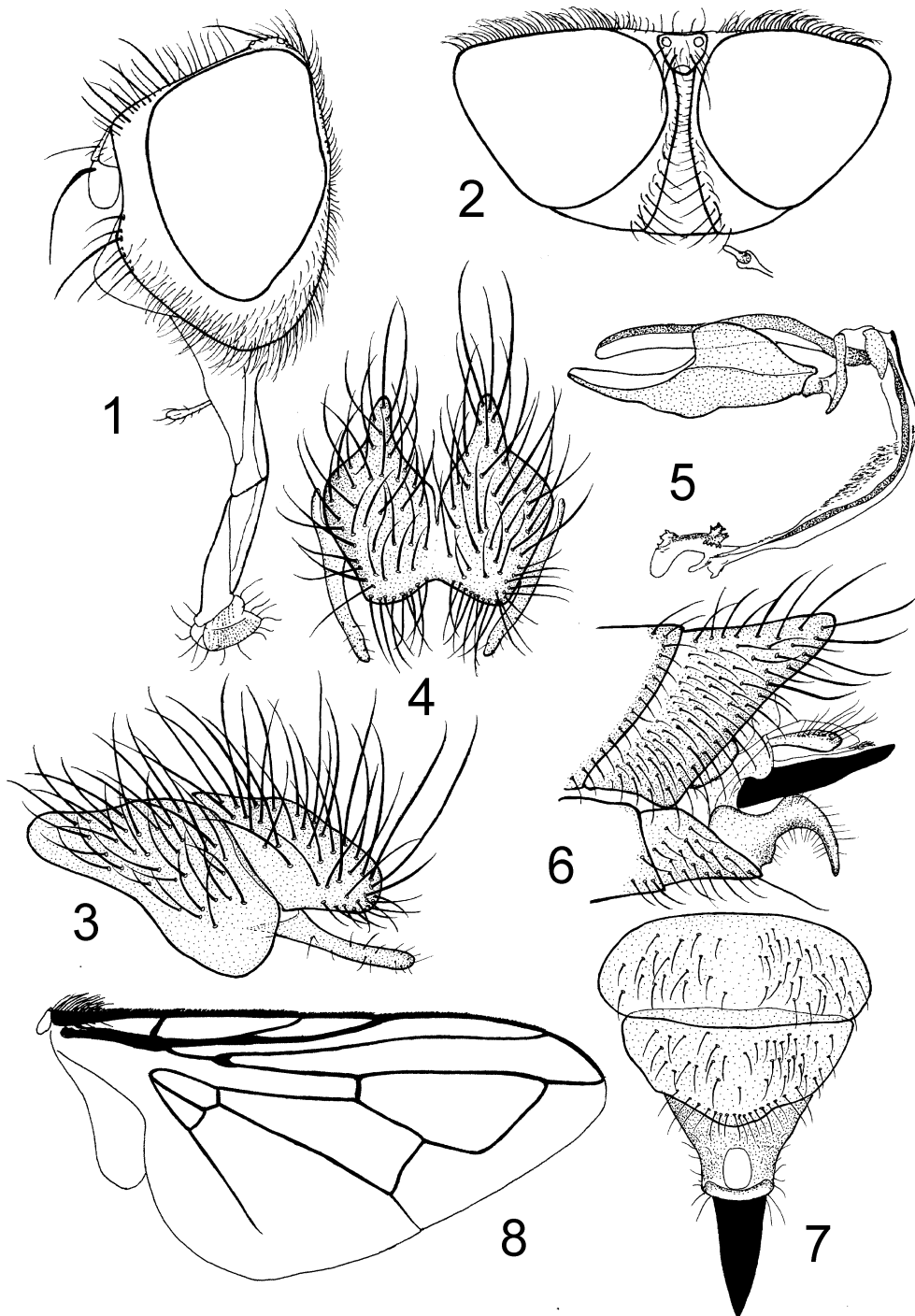
**FIGURE I-56.** *Phasia siberica* Sun (Russia): 1. head profile (♀); 2. dorsal view of head (♀); 3. frontal view of head (♀); 4. lateral view of female terminalia; 5. ventral view of female terminalia; 6. wing (♀).



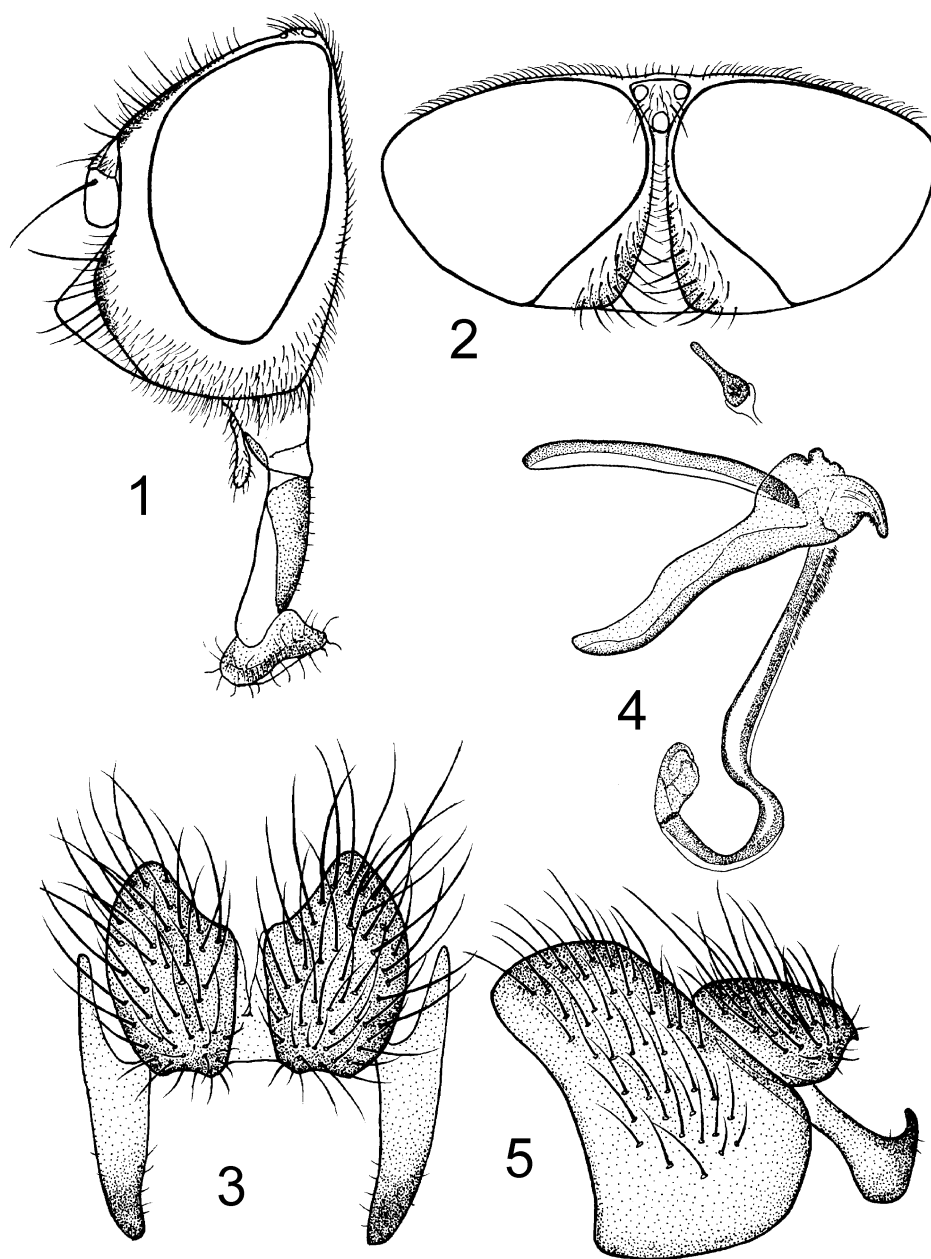
**FIGURE I-57.** 1-5. *Phasia sichuanensis* Sun (China, Sichuan): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀). 6-10. *Phasia wangi* Sun (China, Sichuan): 6. head profile (♀); 7. dorsal view of head (♀); 8. ventral view of female terminalia (♀); 9. lateral view of female terminalia (♀); 10. wing (♀).



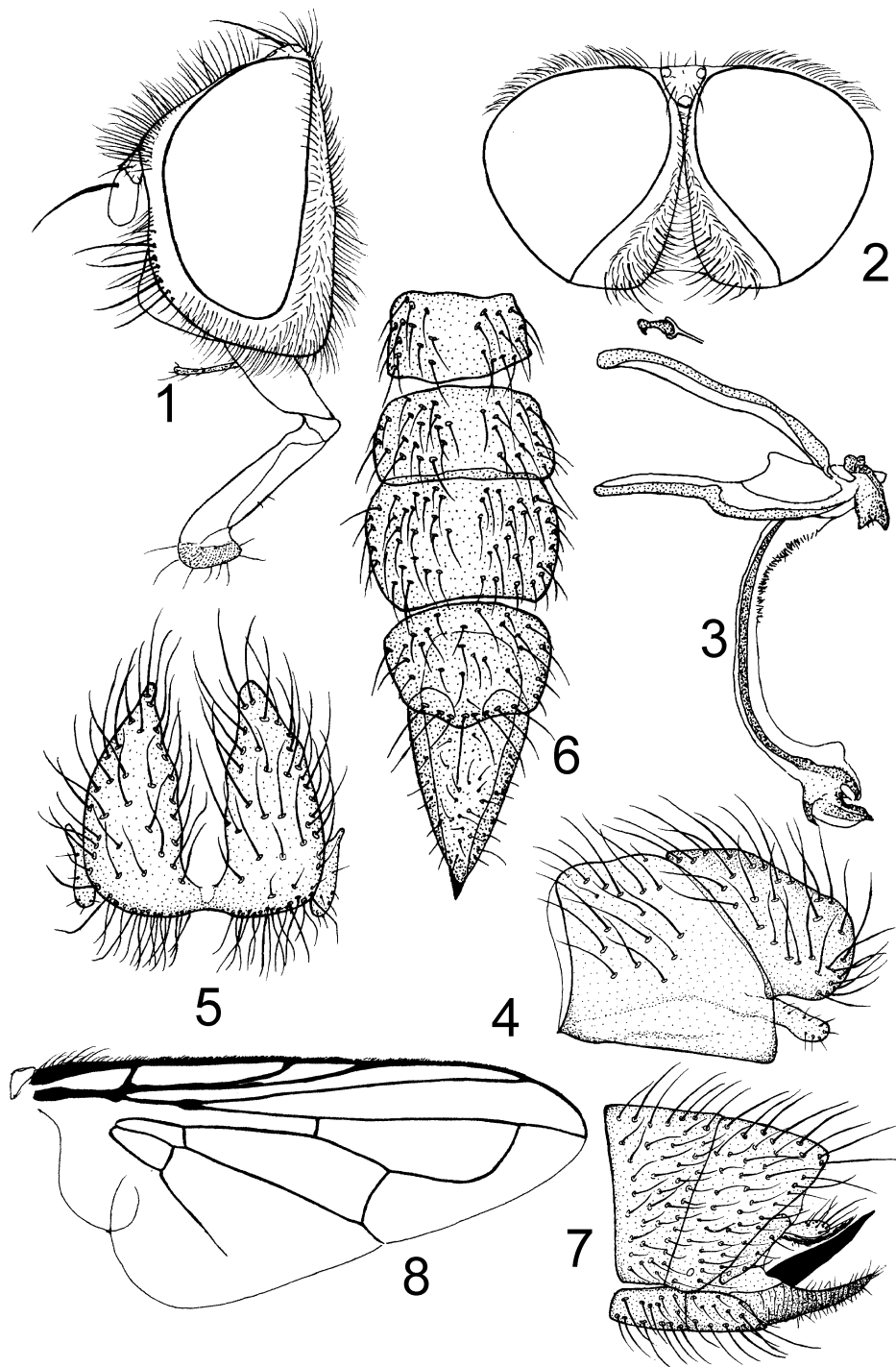
**FIGURE I-58.** *Phasia singuliseta* Sun (India): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. posterior view of male terminalia; 4. lateral view of male hypandrium complex; 5. lateral view of male terminalia; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing ( $\sigma$ ).



**FIGURE I-59.** *Phasia subcoleoprata* (Linnaeus) (Hungary): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male terminalia; 4. posterior view of male terminalia; 5. lateral view of male hypandrium complex; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing (♂).

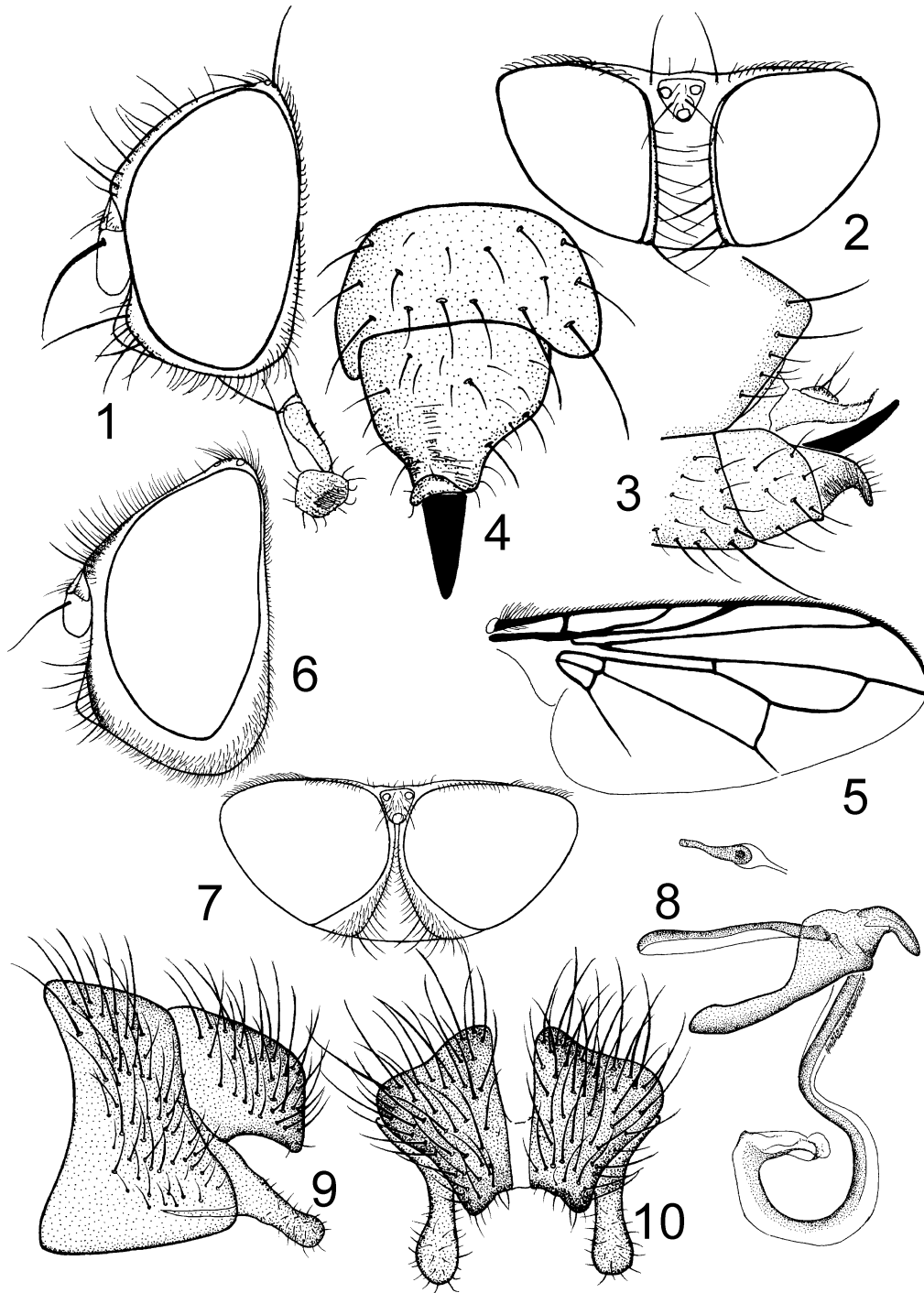


**FIGURE I-60.** *Phasia subnitida* Sun (South Africa): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. posterior view of male terminalia; 4. lateral view male hypandrium complex; 5. lateral view of male terminalia.

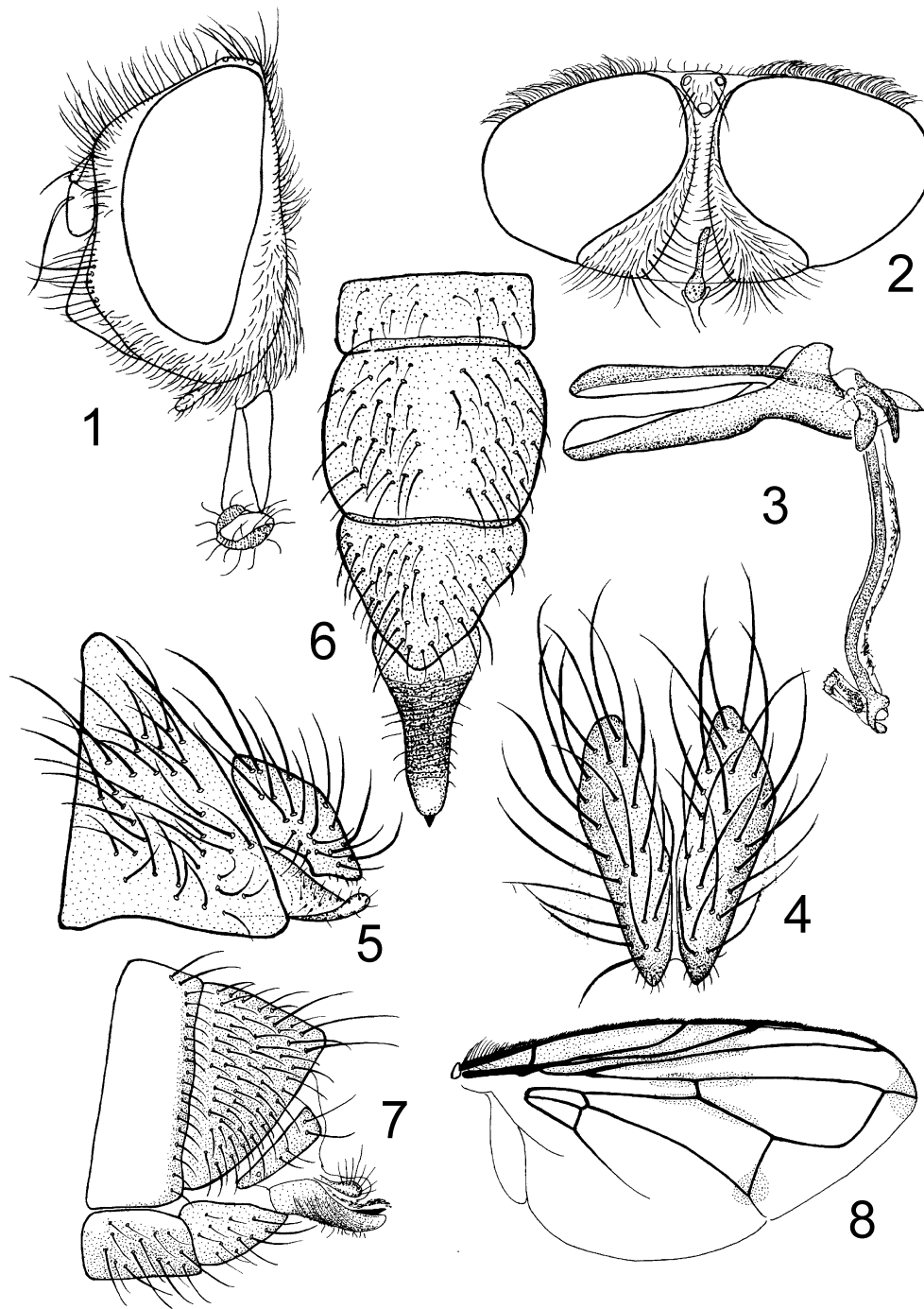


**FIGURE I-61.** *Phasia subopaca* (Coquillett) (Canada): 1. head profile ( $\sigma$ , ON); 2. dorsal view of head ( $\sigma$ , ON); 3. lateral view of male hypandrium complex (QUE); 4. lateral view of male terminalia (QUE); 5. posterior view of male terminalia (QUE); 6. ventral view of female terminalia (QUE); 7. lateral view of female terminalia (QUE); 8. wing ( $\sigma$ , ON).

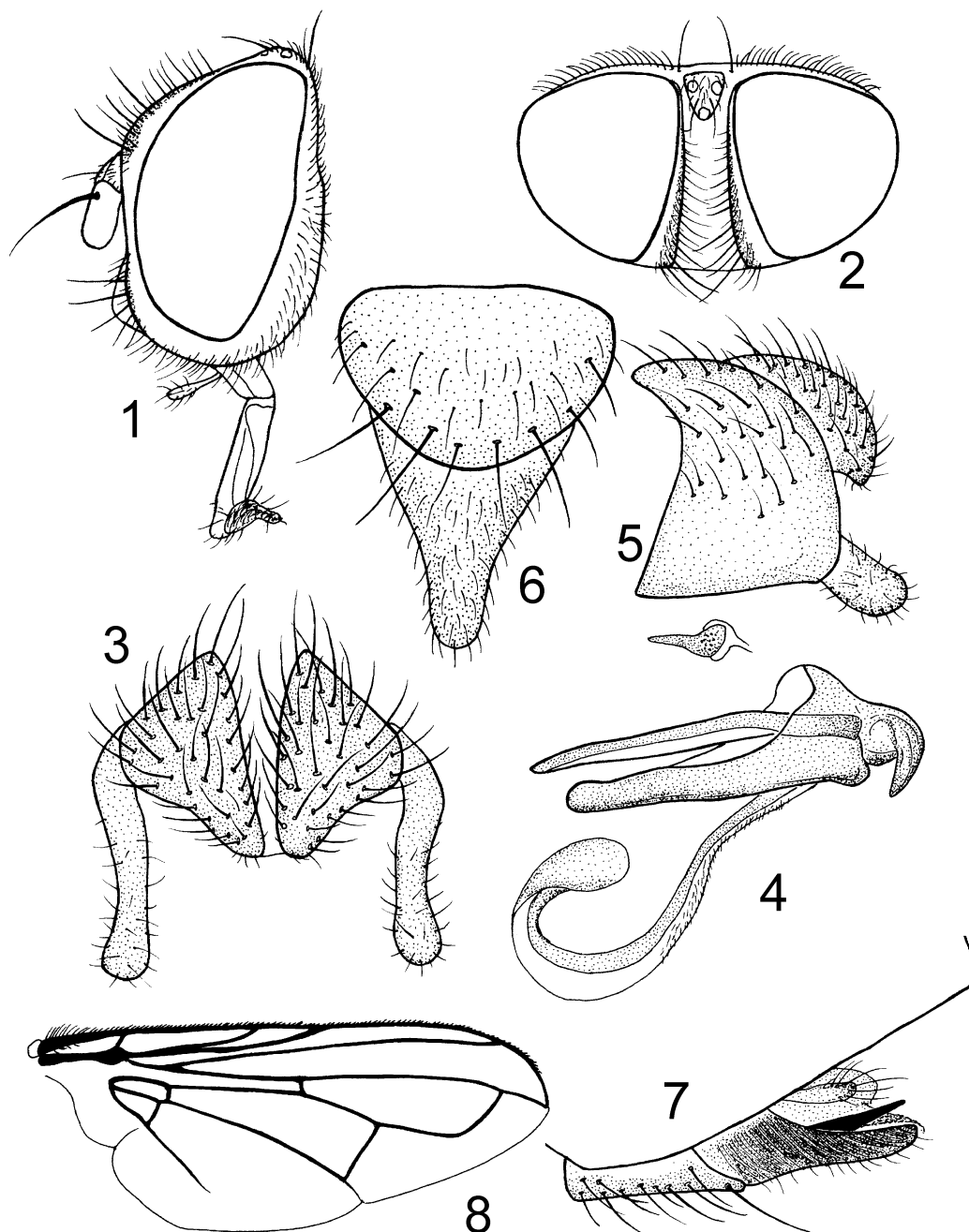




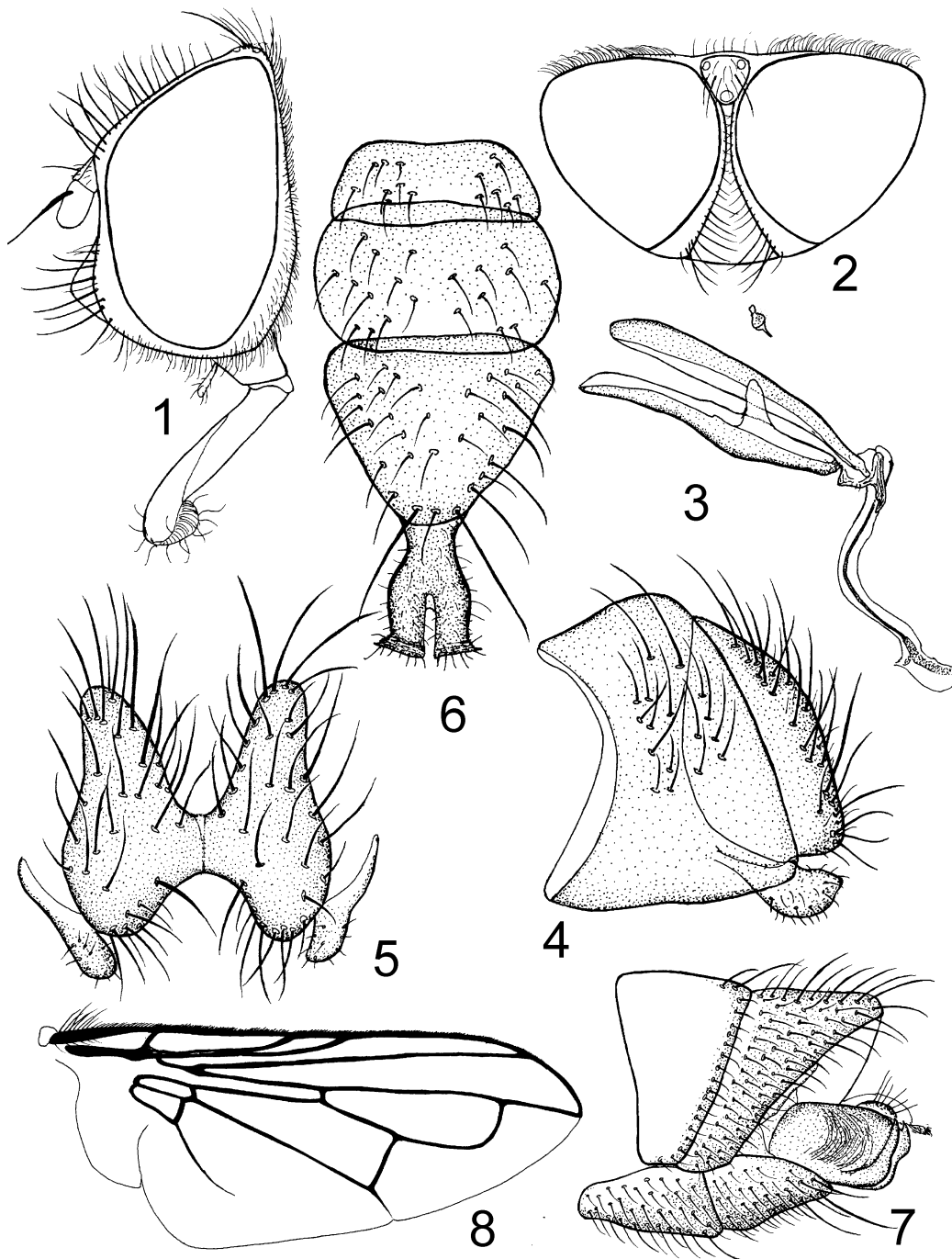
**FIGURE I-62.** 1-5. *Phasia sumatrana* Sun (Indonesia): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of female terminalia; 4. ventral view of female terminalia; 5. wing (♀). 6-10. *Phasia transvaalensis* Sun (South Africa): 6. head profile (♂); 7. dorsal view of head (♂); 8. lateral view of male hypandrium complex; 9. lateral view of male terminalia; 10. posterior view of male terminalia.



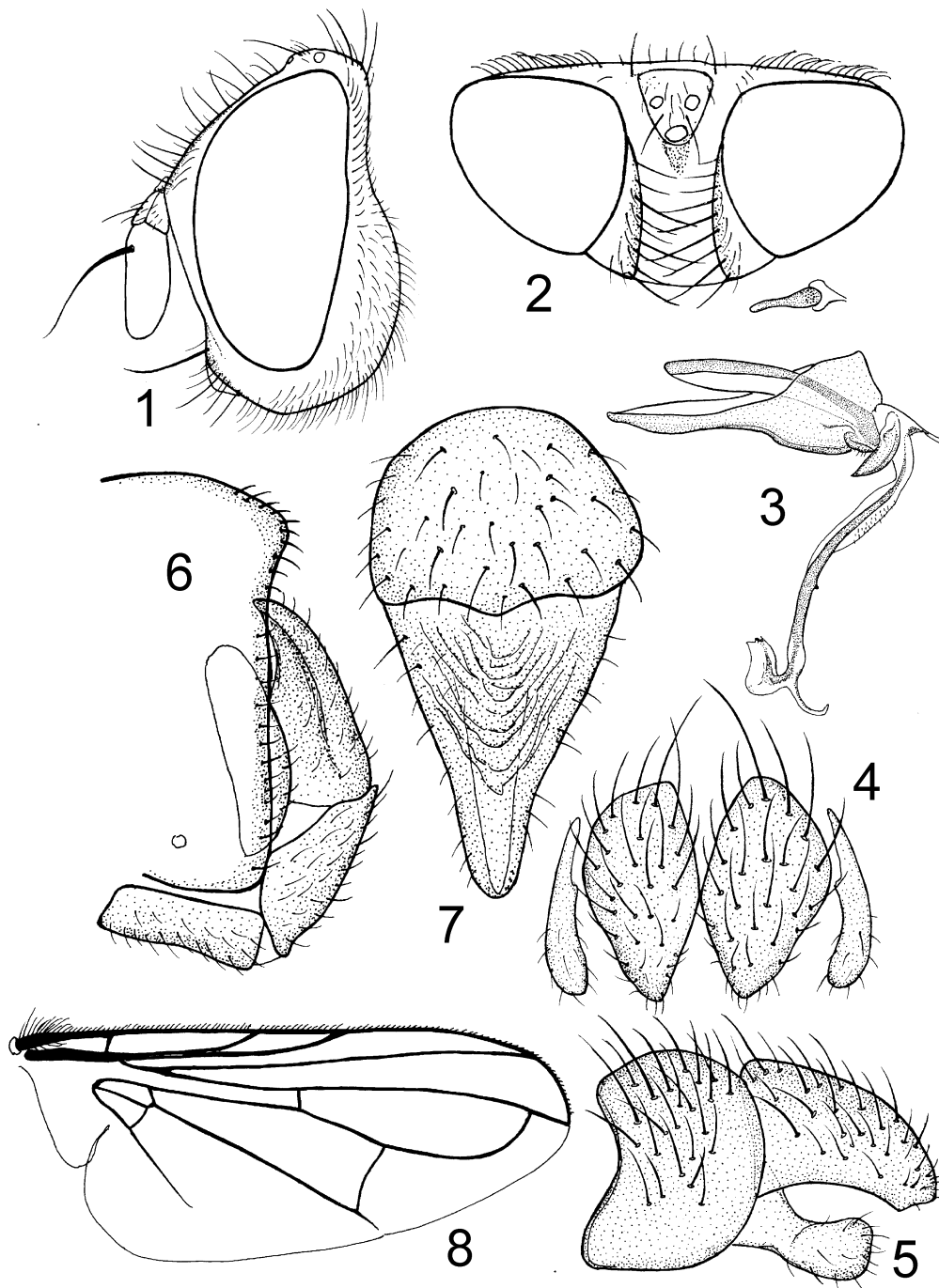
**FIGURE I-63.** *Phasia takanoi* (Draber-Moňko) (Japan): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male hypandrium complex; 4. posterior view of male terminalia; 5. lateral view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing ( $\sigma$ ).



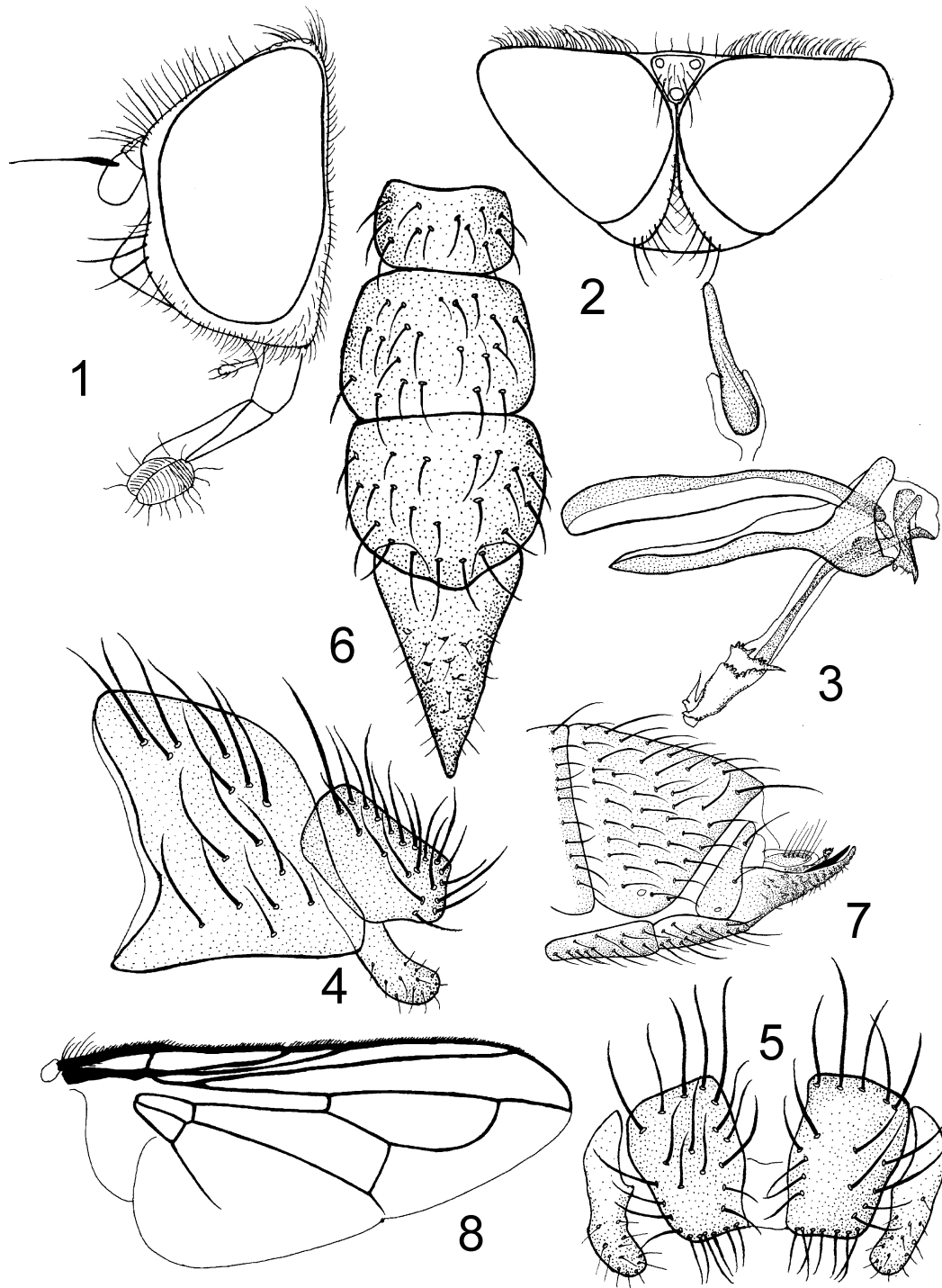
**FIGURE I-64.** *Phasia triangulata* Sun: 1. head profile (♀, Sri Lanka); 2. dorsal view of head (♀, Sri Lanka); 3. posterior view of male terminalia (India); 4. lateral view of male hypandrium complex (India); 5. lateral view of male terminalia (India); 6. ventral view of female terminalia (Sri Lanka); 7. lateral view of female terminalia (Sri Lanka); 8. wing (♀, Sri Lanka).



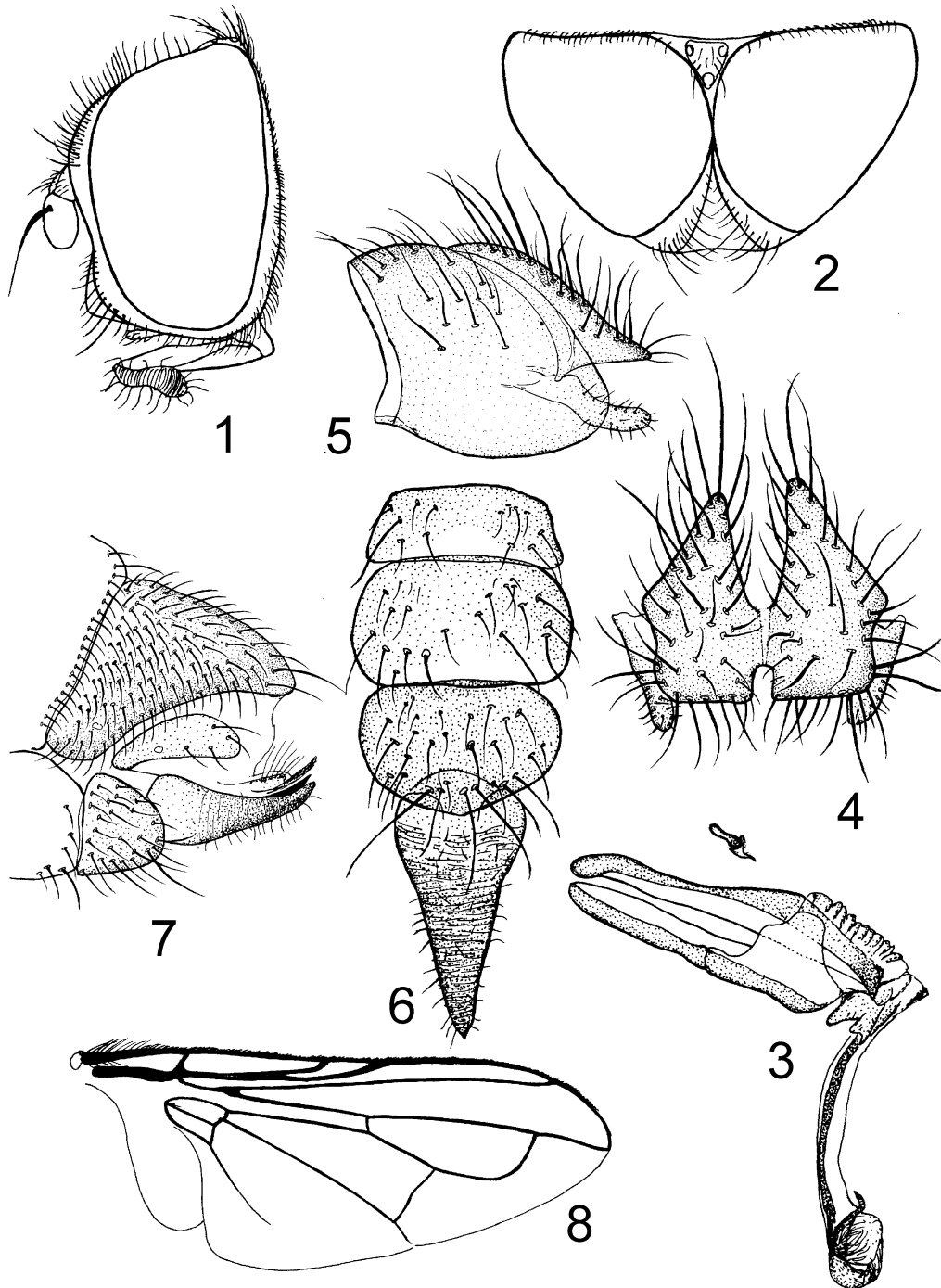
**FIGURE I-65.** *Phasia truncata* Herting (Spain): 1. head profile (♀); 2. dorsal view of head (♀); 3. lateral view of male hypandrium complex; 4. lateral view of male terminalia; 5. posterior view of male terminalia; 6. ventral view of female terminalia; 7. lateral view of female terminalia; 8. wing (♀).



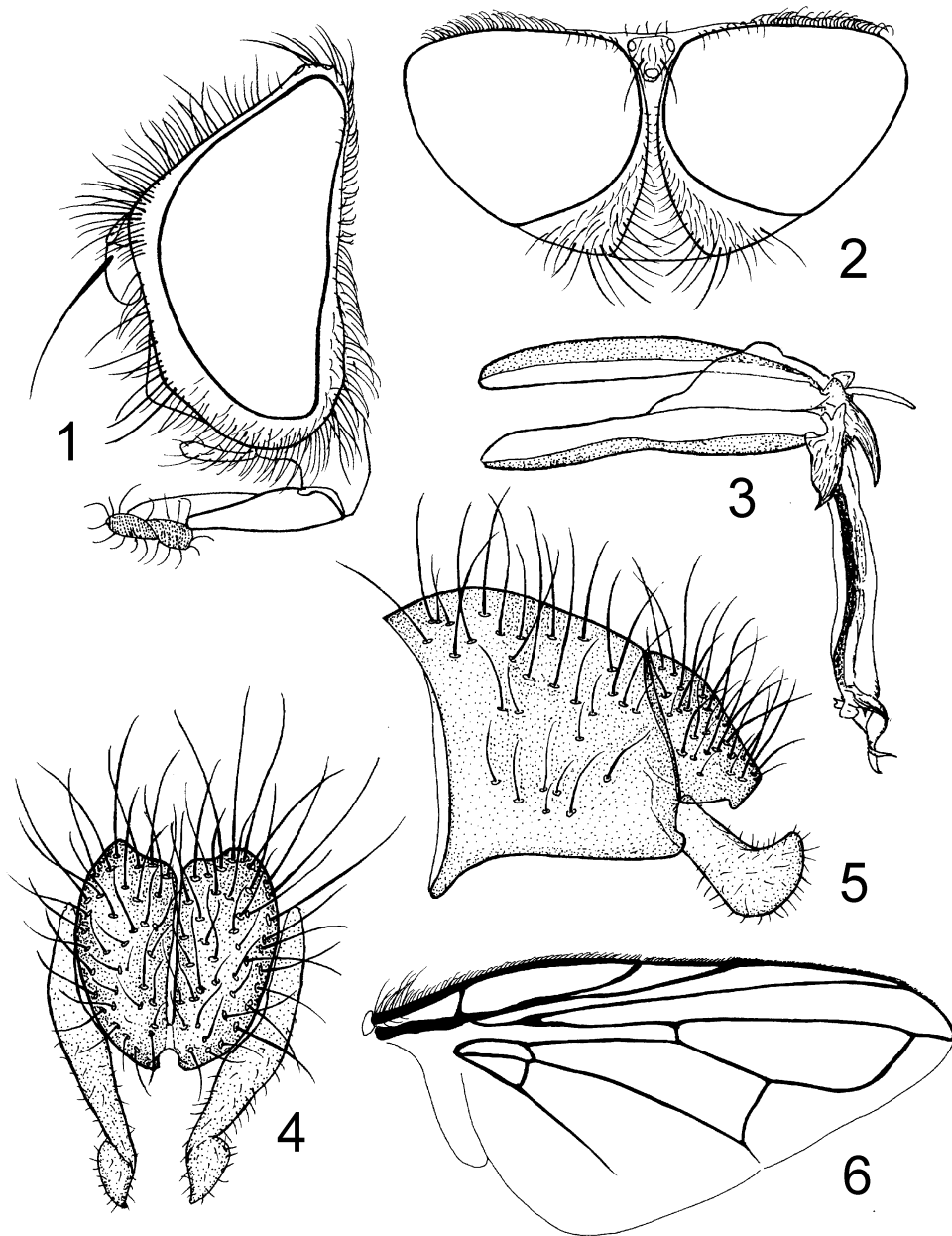
**FIGURE I-66.** *Phasia varicolor* (Curran) (Australia): 1. head profile ( $\sigma$ ); 2. dorsal view of head ( $\sigma$ ); 3. lateral view of male hypandrium complex; 4. posterior view of male terminalia; 5. lateral view of male terminalia; 6. lateral view of female terminalia; 7. ventral view of female terminalia; 8. wing ( $\sigma$ ).



**FIGURE I-67.** *Phasia venturii* (Draber-Moňko): 1. head profile ( $\sigma$ , Algeria); 2. dorsal view of head ( $\sigma$ , Algeria); 3. lateral view of male hypandrium complex (Spain); 4. lateral view of male terminalia (Spain); 5. posterior view of male terminalia (Spain); 6. ventral view of female terminalia (Spain); 7. lateral view of female terminalia (Spain); 8. wing ( $\sigma$ , Algeria).

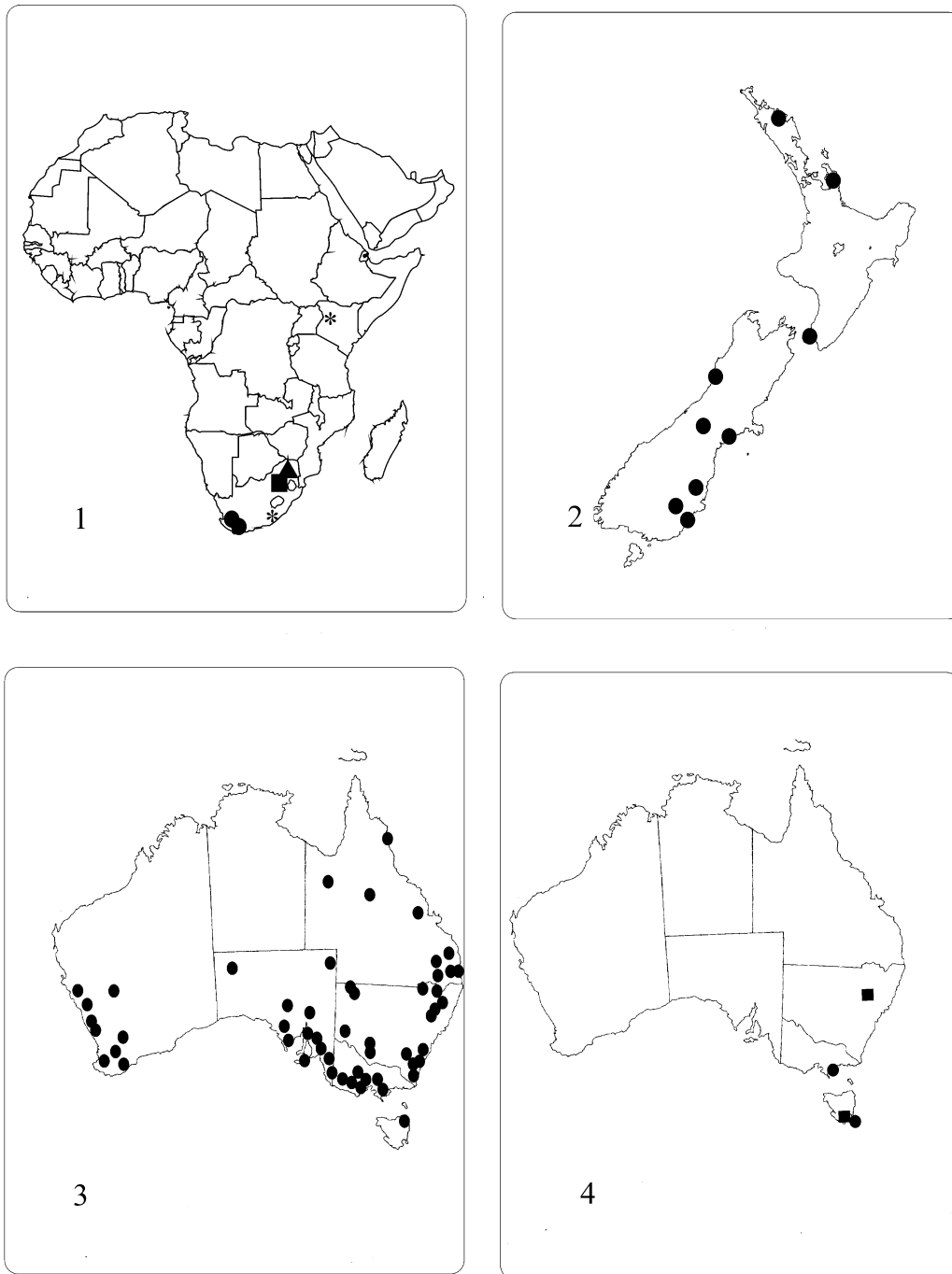


**FIGURE I-68.** *Phasia woodi* Sun: 1. head profile ( $\sigma$ , Australia); 2. dorsal view of head ( $\sigma$ , Australia); 3. lateral view of male hypandrium complex (Malaysia); 4. posterior view of male terminalia (Malaysia); 5. lateral view of male terminalia (Malaysia); 6. ventral view of female terminalia (Malaysia); 7. lateral view of female terminalia (Malaysia); 8. wing ( $\sigma$ , Australia).

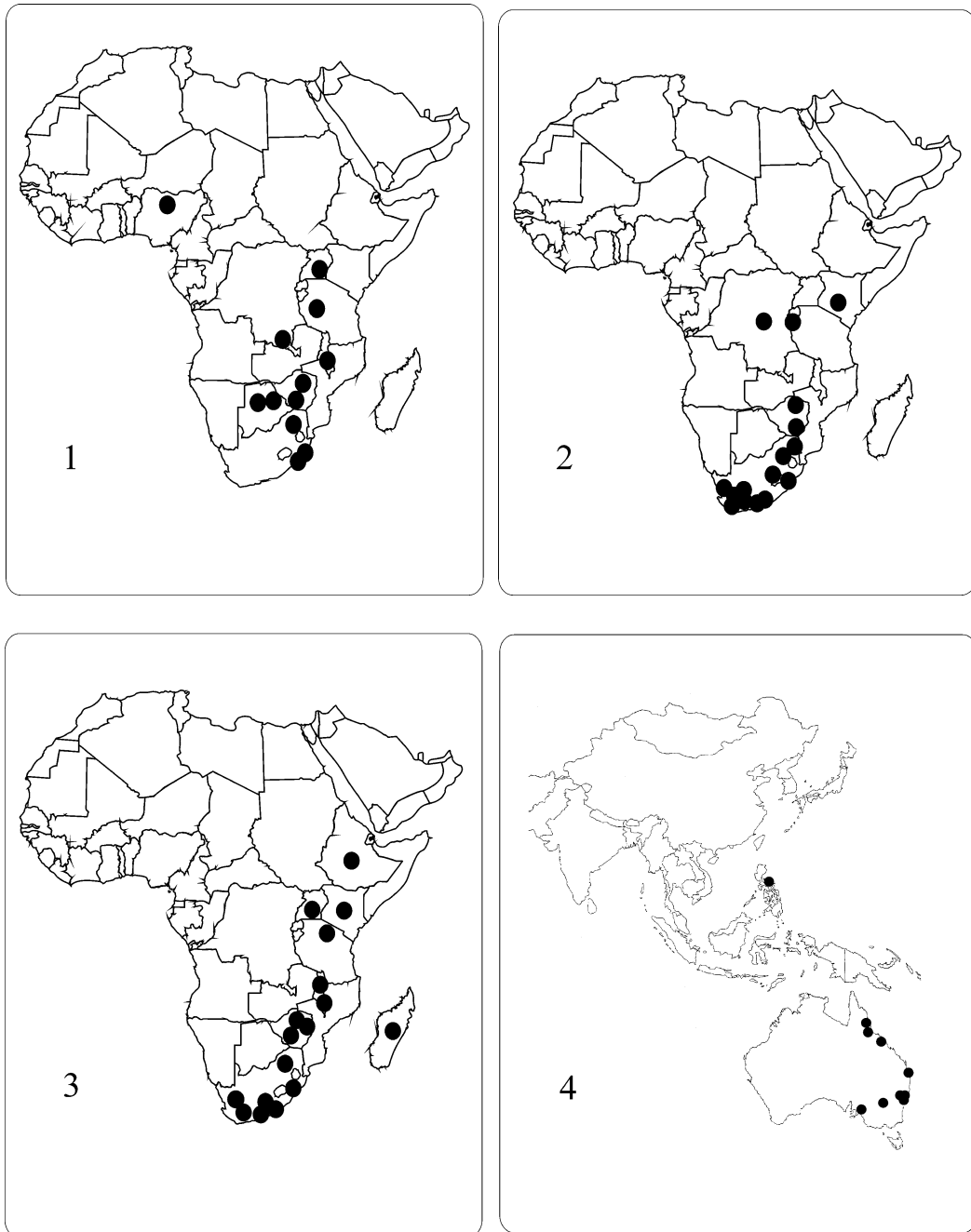


**FIGURE I-69.** *Phasia yunnanica* Sun (China, Yunnan): 1. head profile (♂); 2. dorsal view of head (♂); 3. lateral view of male hypandrium complex; 4. posterior view of male terminalia; 5. lateral view of male terminalia; 6. wing (♂).

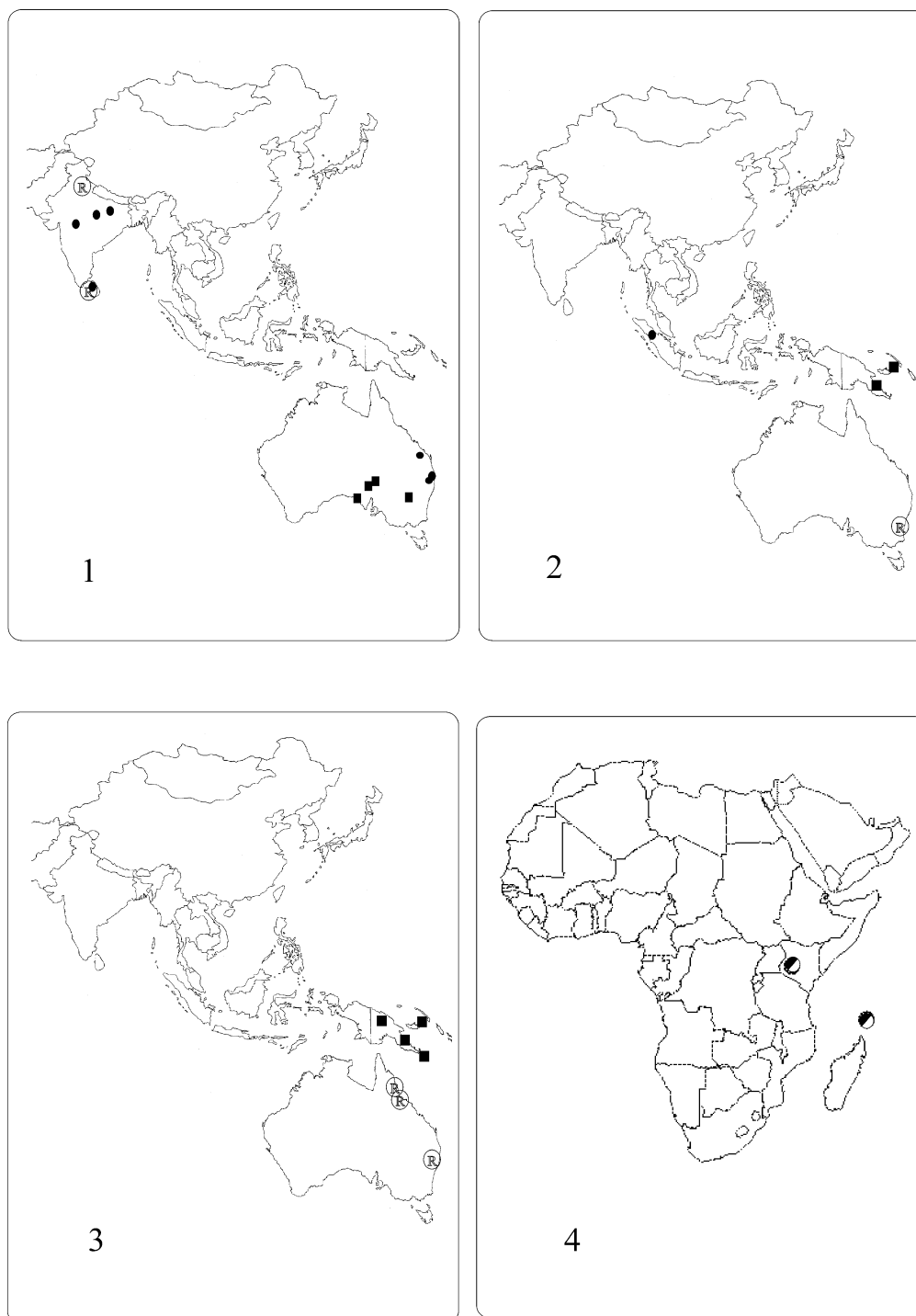




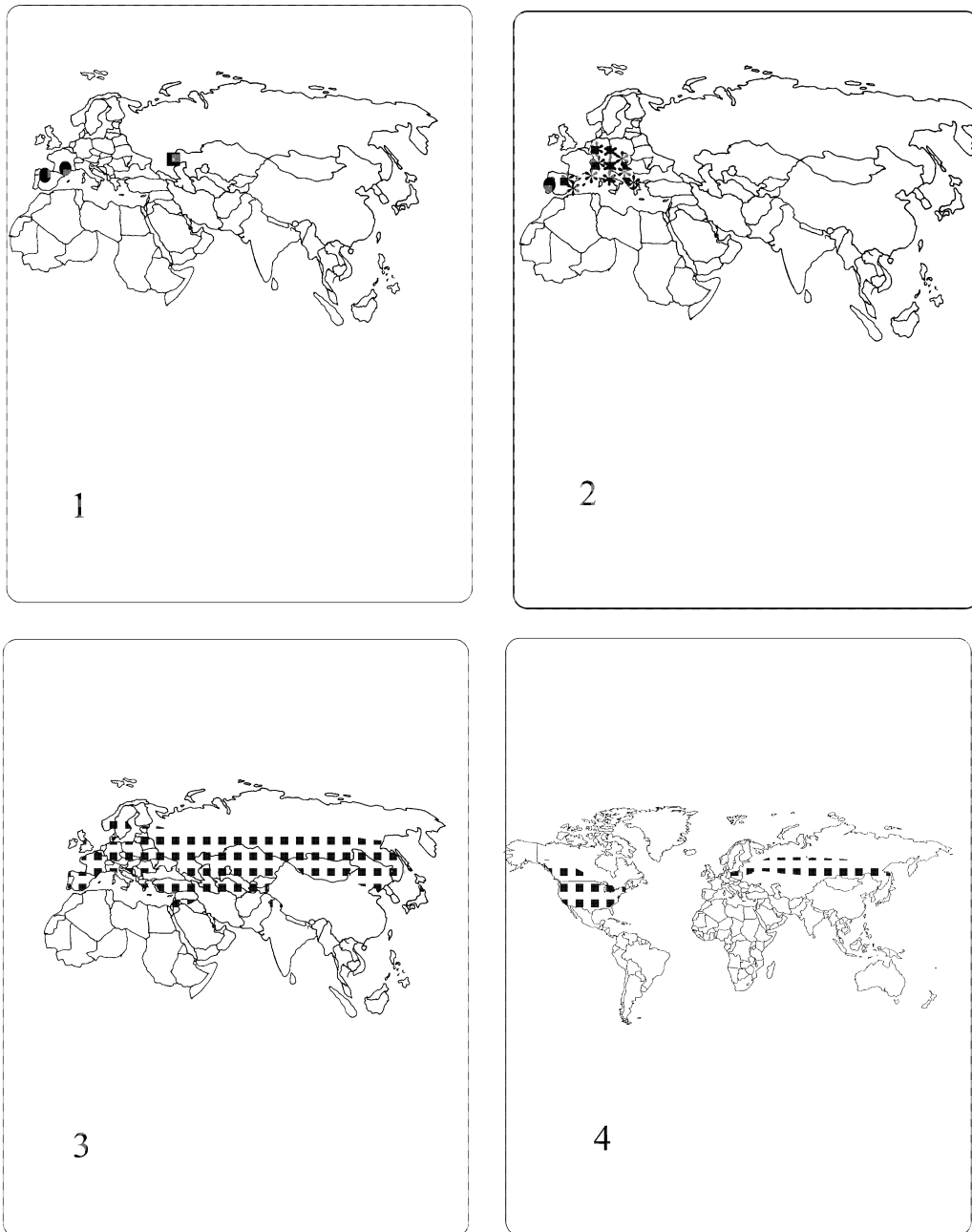
**FIGURE II-1.** 1. Distributions of *Phasia distincta* Sun (▲), *Phasia jeanneli* (Mesnil) (\*), *Phasia nigromaculata* Sun (●) and *Phasia transvaalensis* Sun (■). 2. Distribution of *Phasia campbelli* (Miller). 3. Distribution of *Phasia lepidofera* (Malloch). 4. Distributions of *Phasia brachyptera* Sun (●) and *Phasia furcata* Sun (■).



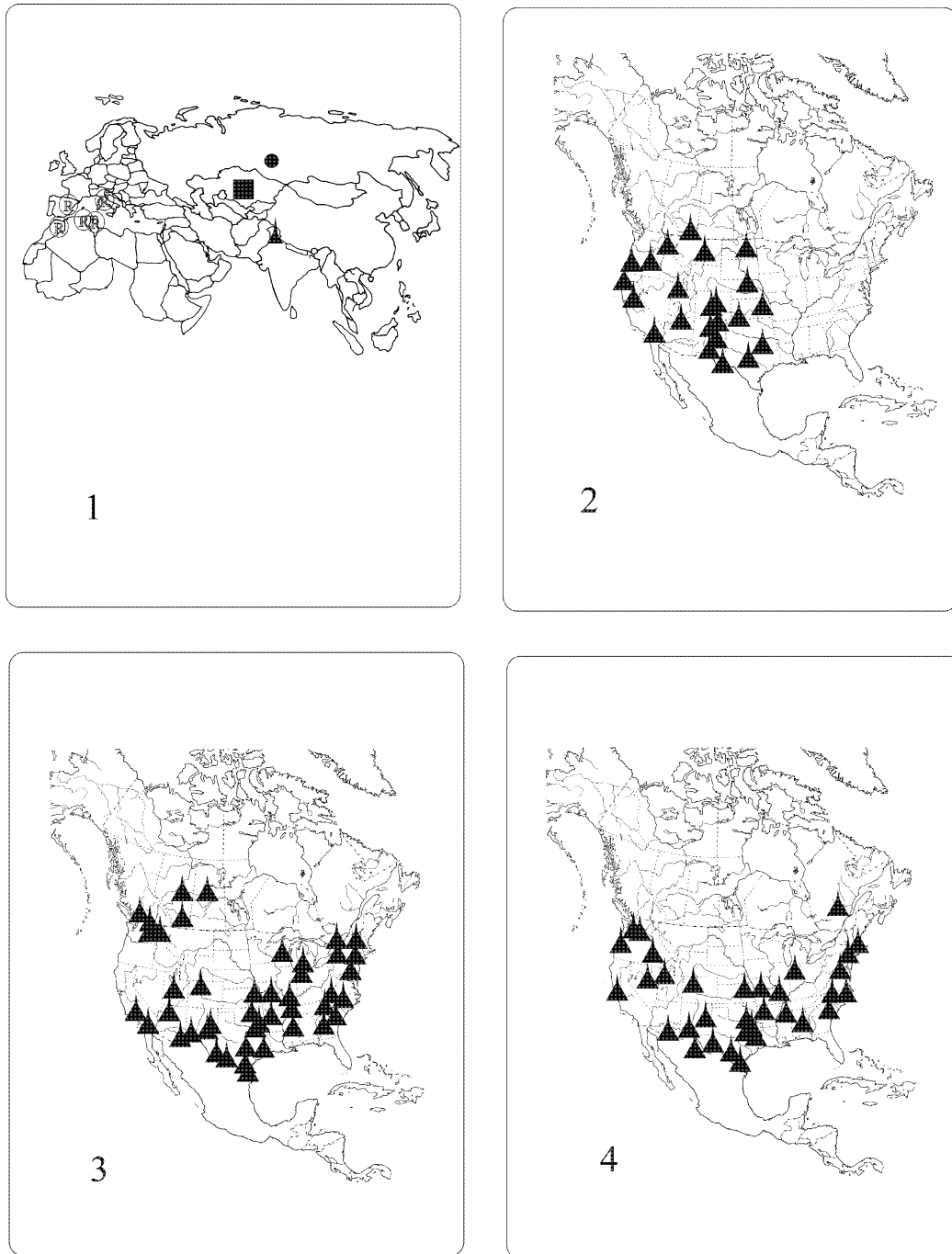
**FIGURE II-2.** 1. Distribution of *Phasia nigrofimbriata* (Villeneuve). 2. Distribution of *Phasia nasuta* (Loew). 3. Distribution of *Phasia argentifrons* Walker. 4. Distribution of *Phasia sensua* (Curran)



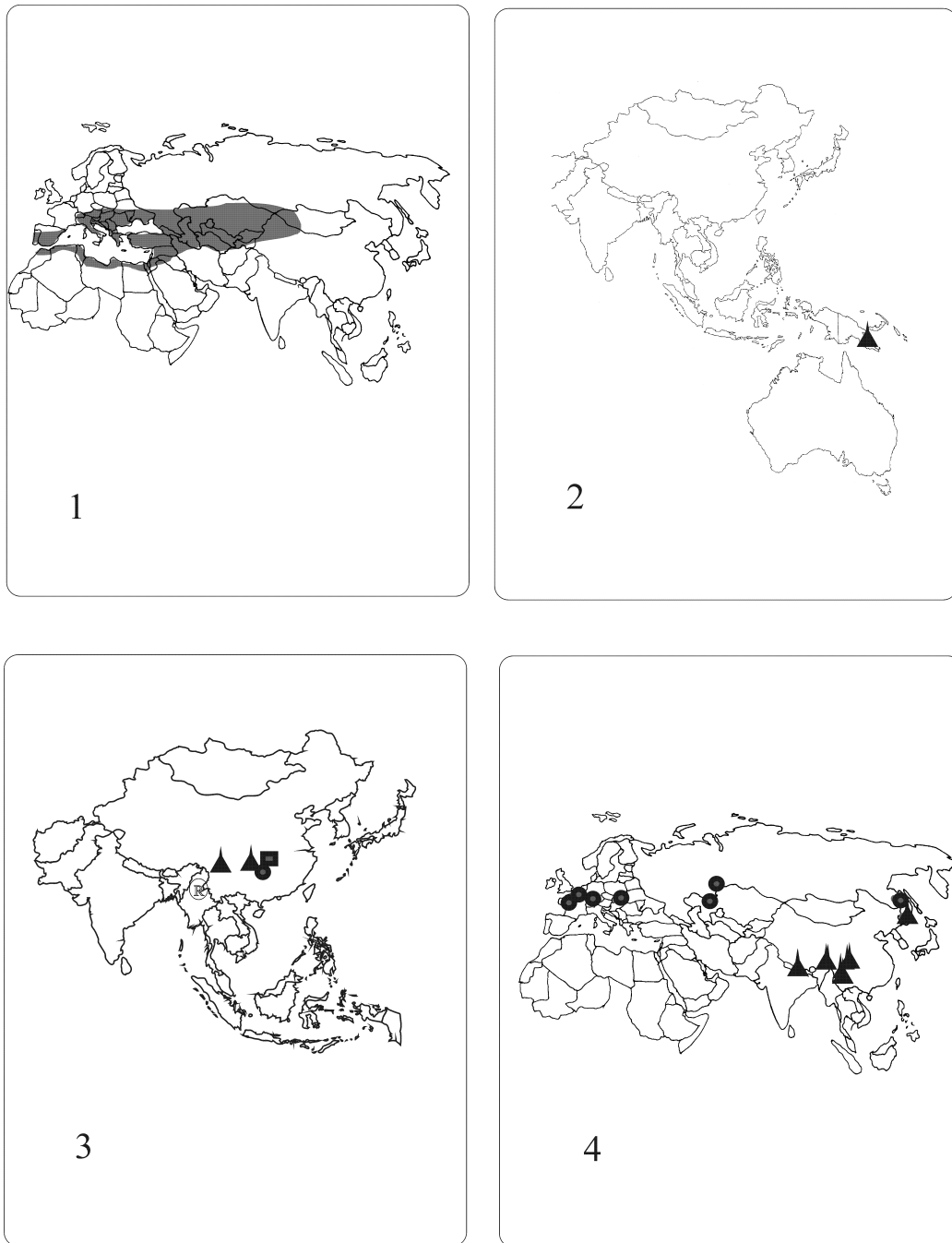
**FIGURE II-3.** 1. Distributions of *Phasia rotundata* Sun (■), *Phasia triangulata* Sun (Ⓜ) and *Phasia varicolor* (Curran) (●). 2. Distributions of *Phasia minima* Sun (■), *Phasia latifrons* (Paramonov) (Ⓜ) and *Phasia sumatrana* Sun (●). 3. Distributions of *Phasia normalis* (Curran) (Ⓜ) and *Phasia cylindrata* Sun (■). 4. Distribution of *Phasia mathisi* Sun.



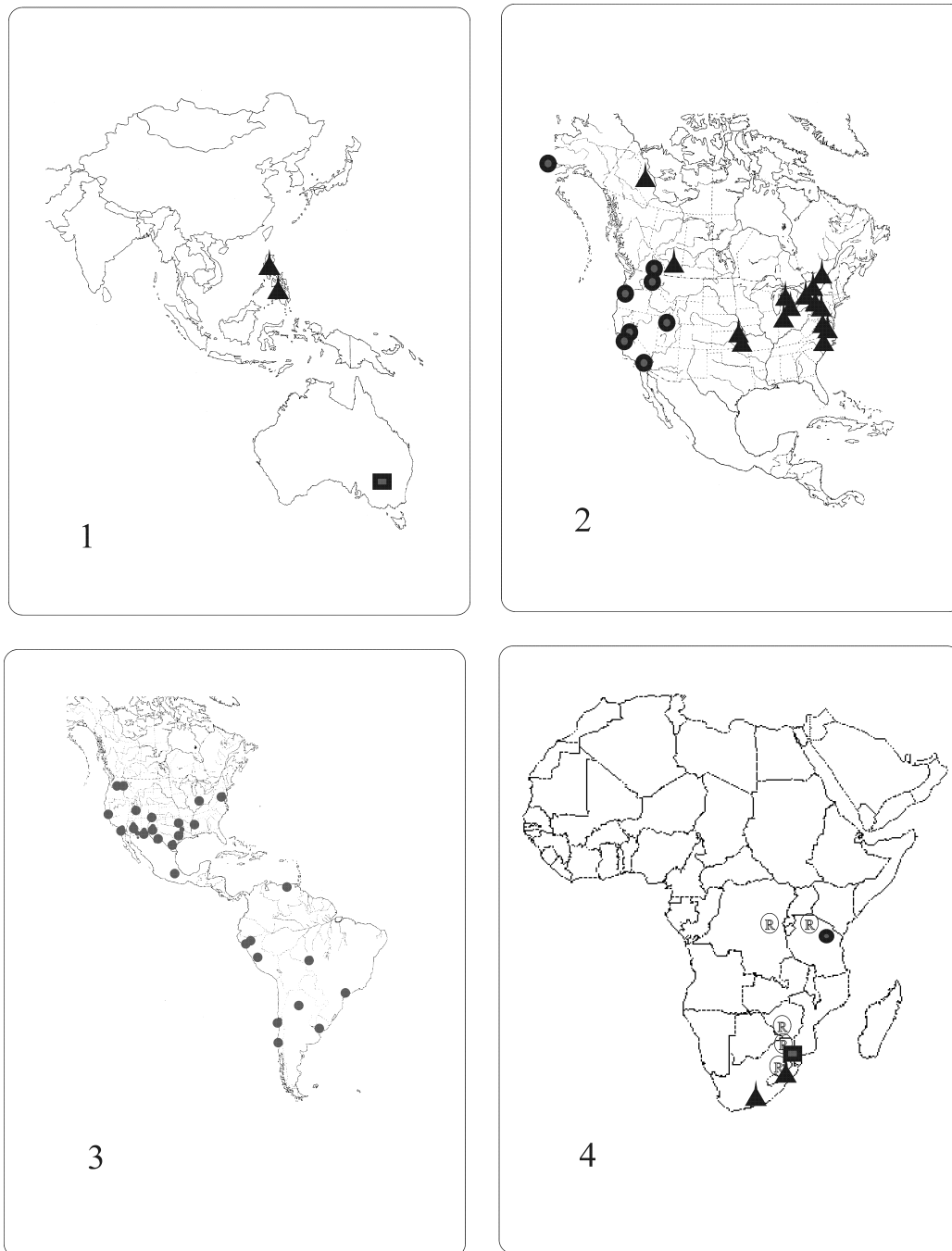
**FIGURE II-4.** 1. Distributions of *Phasia emdeni* (Draber-Moňko) (●) and *Phasia girschneri* (Draber-Moňko) (■). 2. Distributions of *Phasia pandellei* (Dupuis) (\*), and *Phasia truncata* Herting (●). 3. Distribution of *Phasia pusilla* Meigen. 4. Distribution of *Phasia aldrichii* (Townsend).



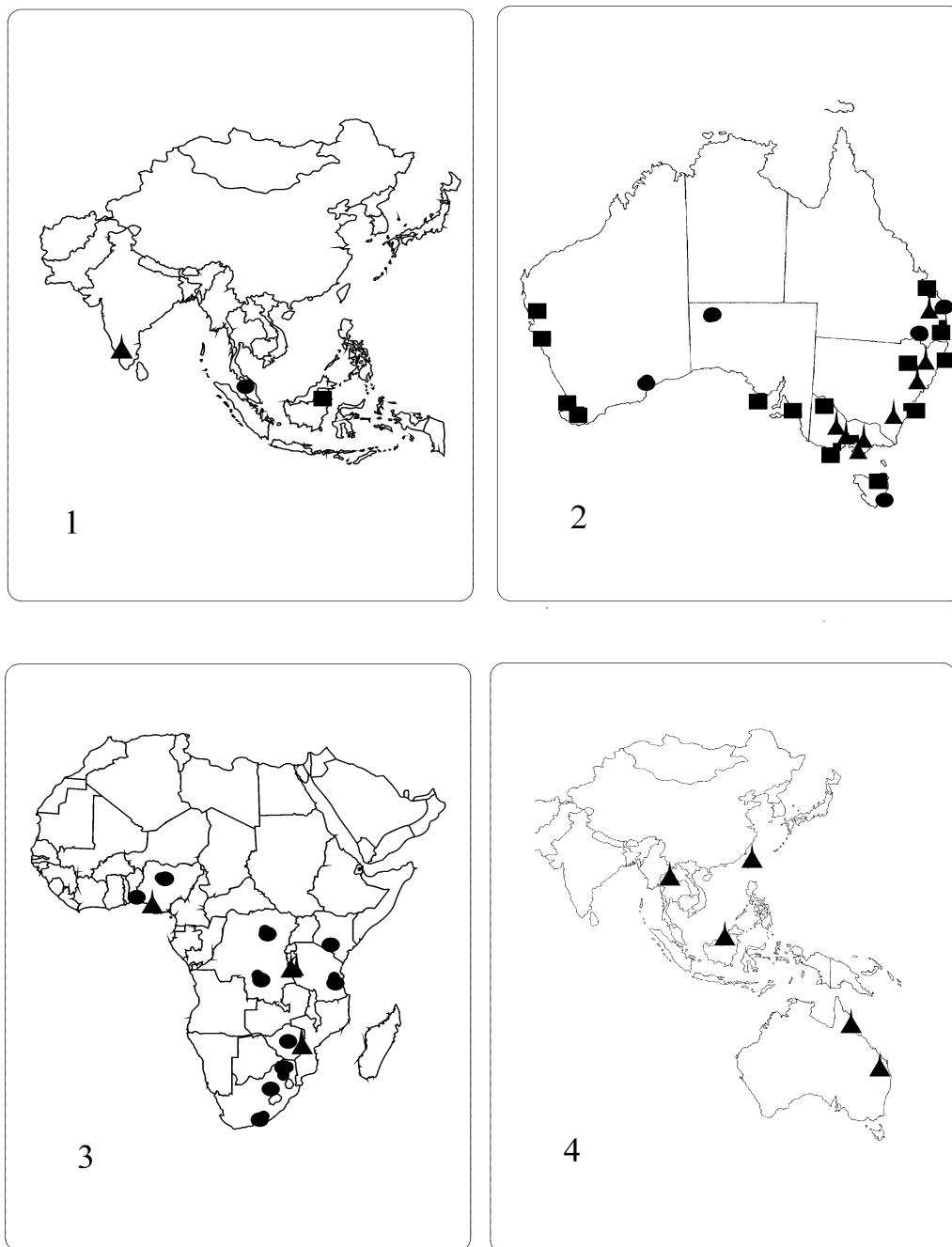
**FIGURE II-5.** 1. Distributions of *Phasia indica* (Mesnil) (▲), *Phasia noskiewiczi* (Draber-Mońko) (■), *Phasia siberica* Sun (●) and *Phasia venturii* (Draber-Mońko) (⊗). 2. Distribution of *Phasia robusta* (Brooks). 3. Distribution of *Phasia purpurascens* (Townsend). 4. Distribution of *Phasia punctigera* (Townsend)



**FIGURE II-6.** 1. Distribution of *Phasia mesnili* (Draber-Mońko). 2. Distribution of *Phasia faceta* Sun. 3. Distributions of *Phasia bifurca* Sun (▲), *Phasia malaisei* Sun (⊗), *Phasia sichuanensis* Sun (●) and *Phasia wangi* Sun (■). 4. Distributions of *Phasia barbifrons* (Girschner) (●) and *Phasia rohdendorfi* (Draber-Mońko) (▲).

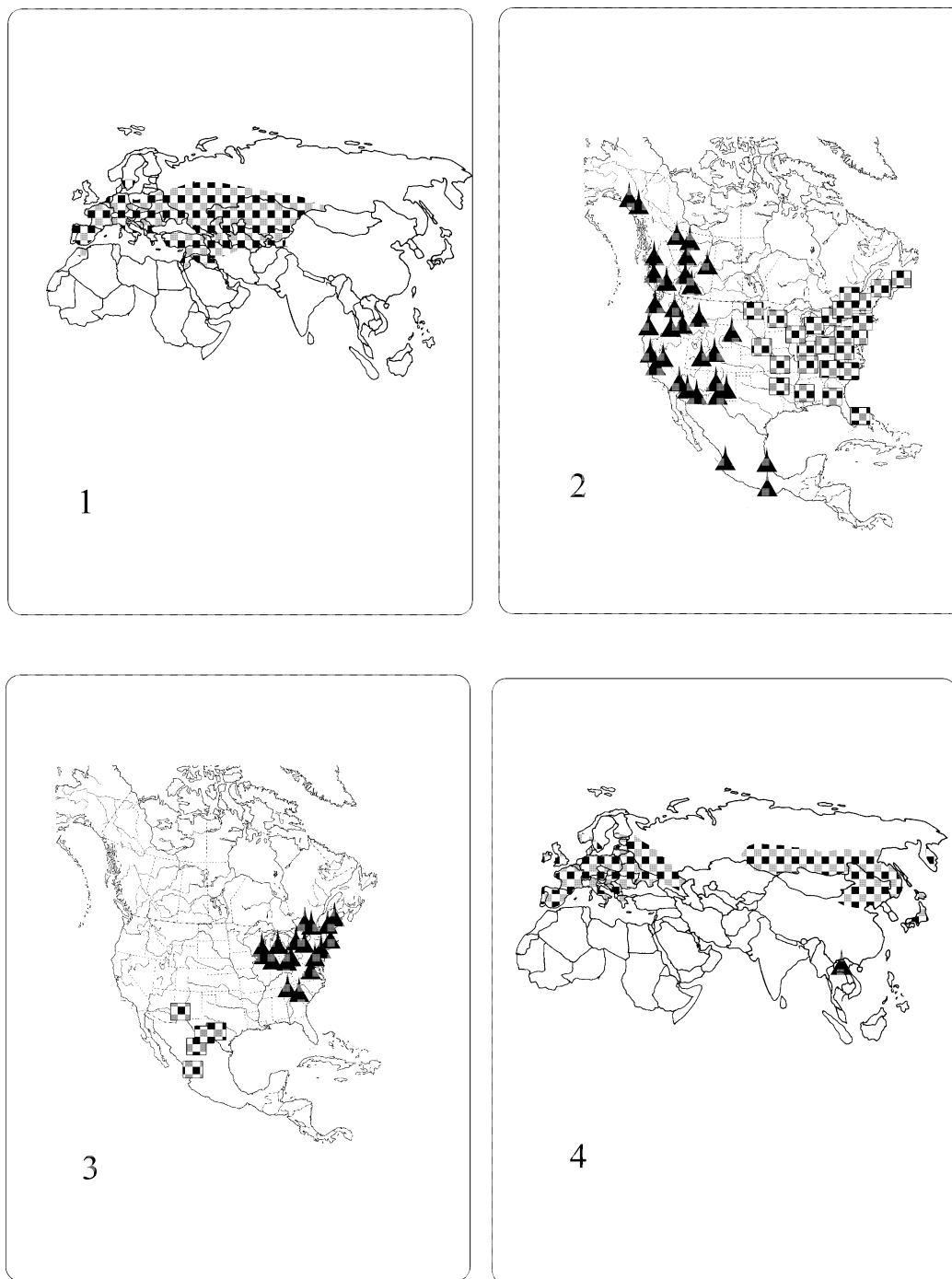


**FIGURE II-7.** 1. Distributions of *Phasia frontata* Sun (■) and *Phasia serrata* Sun (▲). 2. Distributions of *Phasia albipennis* (Brooks) (●) and *Phasia fenestrata* (Bigot) (▲). 3. Distribution of *Phasia chilensis* (Macquart). 4. Distributions of *Phasia cana* Sun (Ⓜ), *Phasia clavigralla* Sun (●), *Phasia africana* Sun (▲) and *Phasia subnitida* Sun (■).

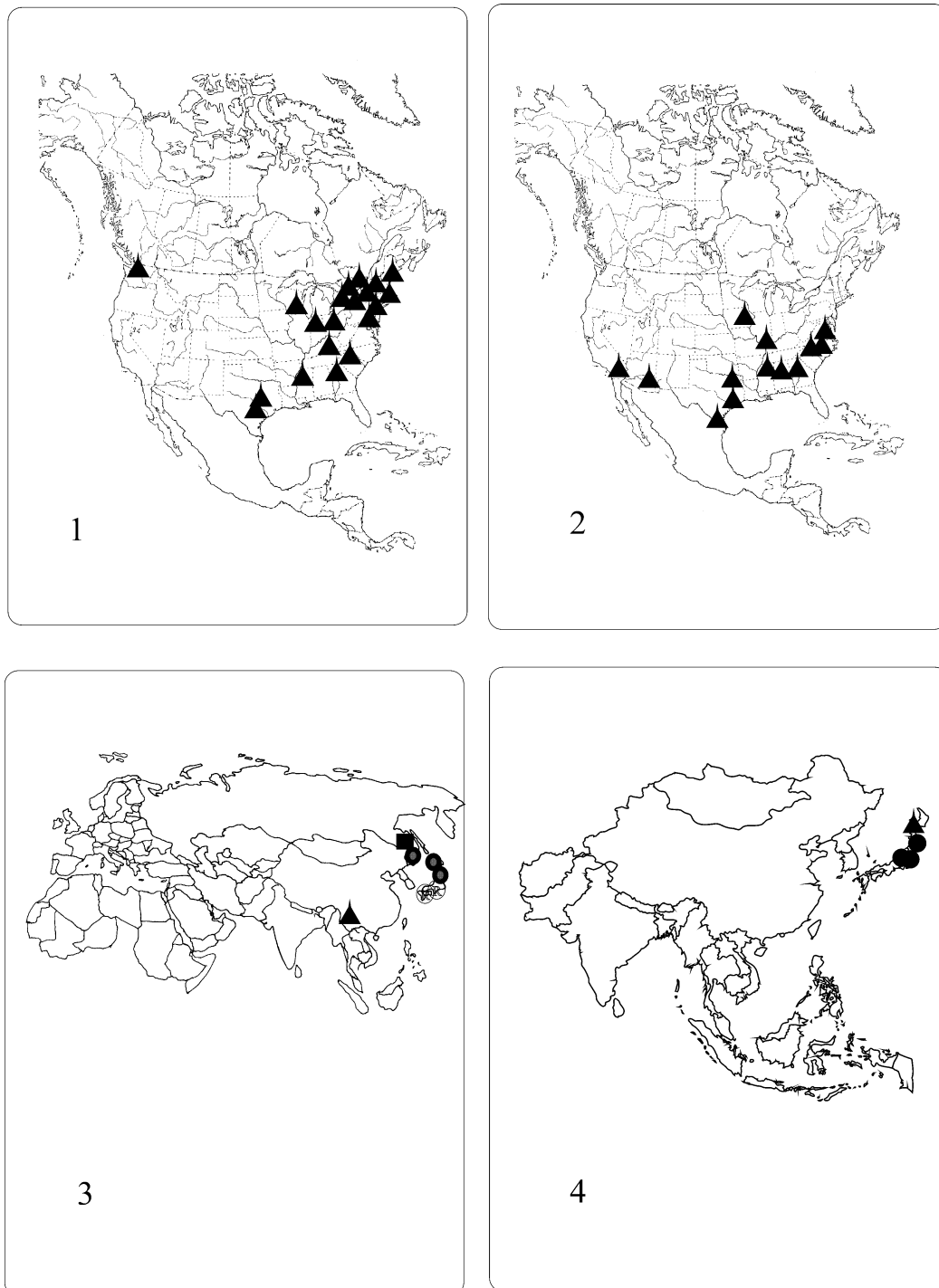


**FIGURE II-8.** 1. Distributions of *Phasia lautia* Sun (■), *Phasia malayana* Sun (●) and *Phasia singulisetata* Sun (▲). 2. Distributions of *Phasia australiensis* Sun (●), *Phasia hippobosca* (Paramonov) (▲) and *Phasia rufiventris* (Macquart) (■). 3. Distributions of *Phasia multisetosa* (Villeneuve) (▲) and *Phasia nasalis* (Bezzi) (●). 4. Distribution of *Phasia woodi* Sun

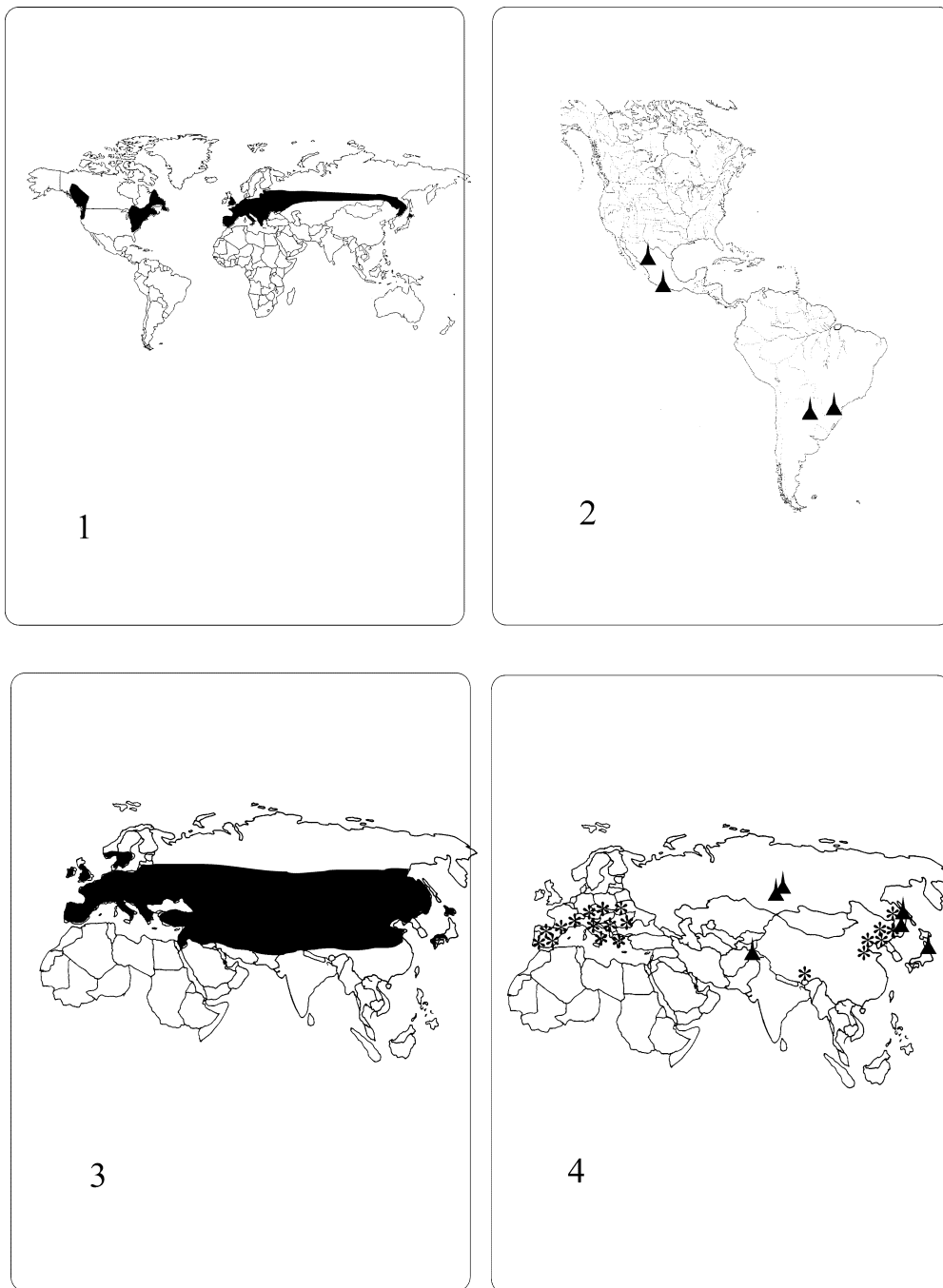




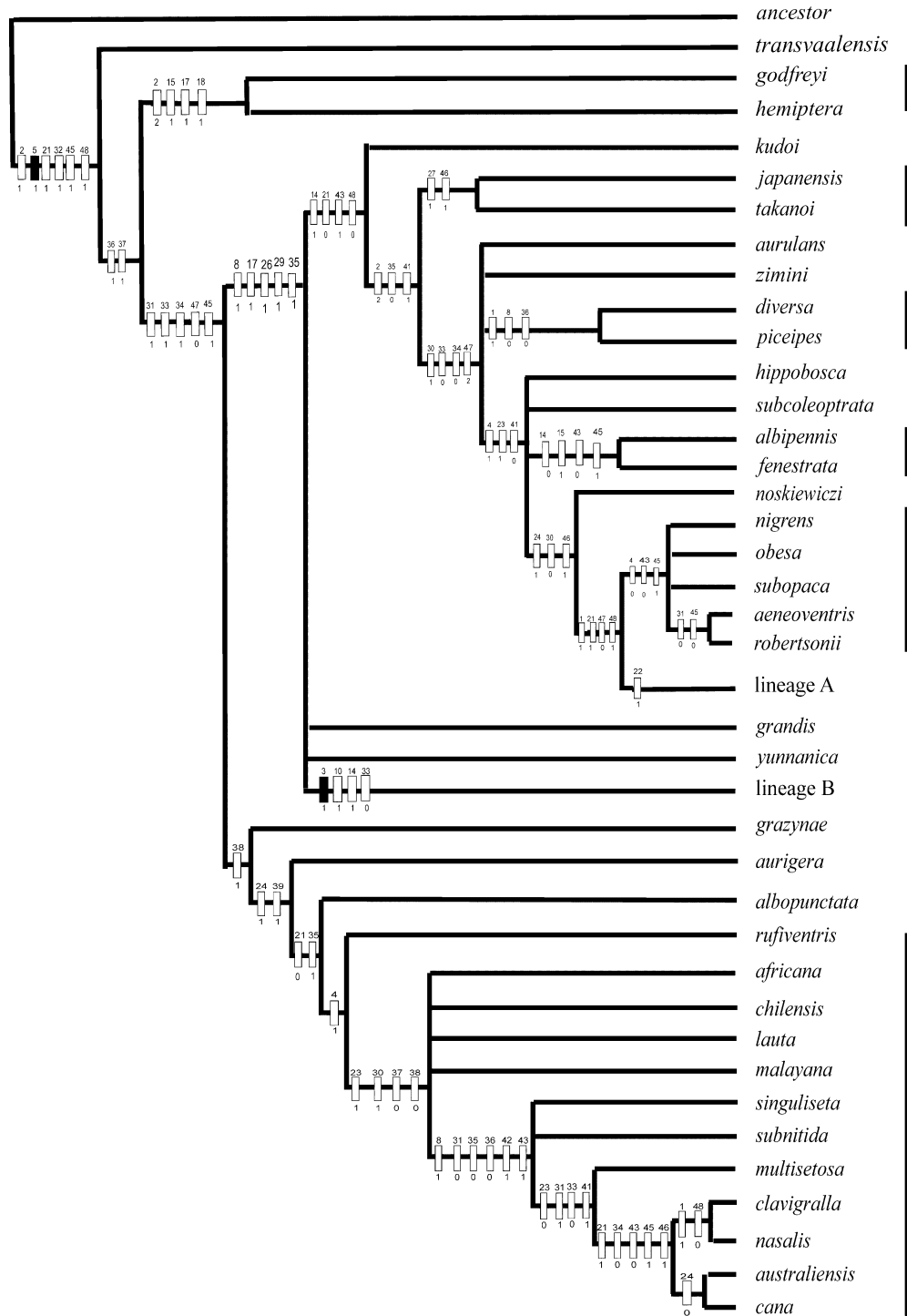
**FIGURE II-9.** 1. Distribution of *Phasia subcoleoptrata* (Linnaeus). 2. Distributions of *Phasia aeneoventris* (Williston)(▲) and *Phasia robertsonii* (Townsend)(■). 3. Distributions of *Phasia nigrens* (Wulp)(■) and *Phasia subopaca* (Coquillett)(▲) 4. Distributions of *Phasia hemiptera* (Fabricius) (■) and *Phasia godfreyi* (Draber-Mońko)(▲).



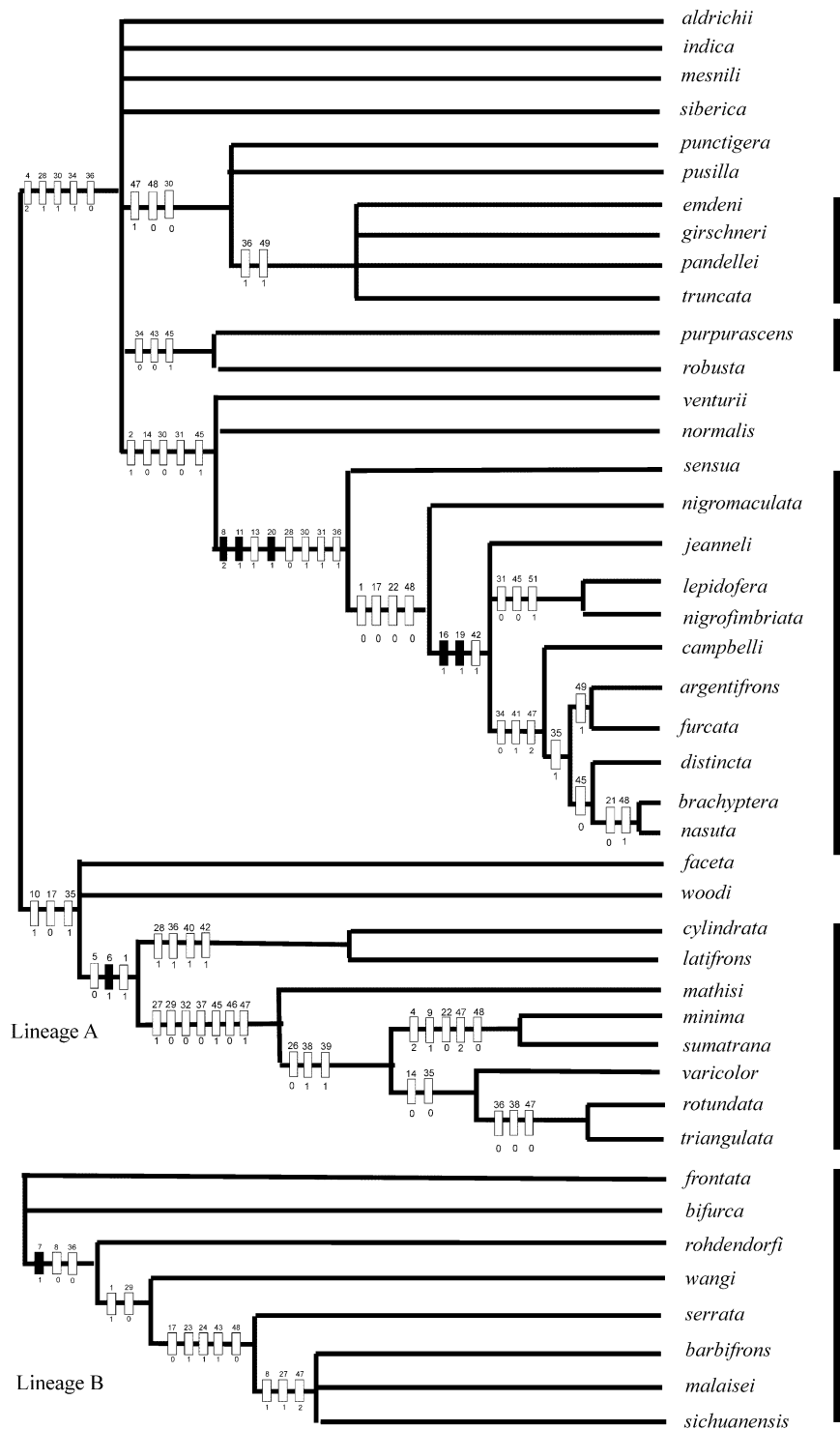
**FIGURE II-10.** 1. Distribution of *Phasia diversa* (Coquillett). 2. Distribution of *Phasia grandis* (Coquillett). 3. Distributions of *Phasia grazynae* (Draber-Moňko) (ⓐ), *Phasia takanoi* (Draber-Moňko) (●), *Phasia yunnanica* Sun (▲) and *Phasia zimini* (Draber-Moňko) (■). 4. Distributions of *Phasia japonensis* Sun (●) and *Phasia kudoii* Sun (▲).



**FIGURE II-11.** 1. Distribution of *Phasia aurulans* Meigen. 2. Distribution of *Phasia piceipes* (Wulp) 3. Distribution of *Phasia obesa* (Fabricius). 4. Distributions of *Phasia aurigera* (Egger) (\*) and *Phasia albopunctata* (Baranov) (▲).



**FIGURE III-1.** Phylogeny of *Phasia* (part 1) Character numbers above boxes refer to the characters in Table 1; numbers below boxes refer to transformation series states; black bars on right side refer to the monophyletic groups discussed in the text.



**FIGURE III-2.** Phylogeny of *Phasia* (part 2) Character numbers above boxes refer to the characters in Table 1; numbers below boxes refer to transformation series states. Black bars on right side refer to the monophyletic groups discussed in the text.

**Appendix. Parasite-host list for the world *Phasia***

(Host records marked with an asterisk are doubtful)

***Phasia aeneoventris****Lygus hesperus* Knight (Hemiptera, Miridae): Thompson 1950: 69; Arnaud 1978: 59. USA (CA).***Phasia albipennis****Eurygaster* spp. (Hemiptera, Pentatomodae): Vojdani 1961: 576. USA (CA).***Phasia aldrichii****Emblethis vicarius* Horvath (Hemiptera, Lygaeidae): Scudder 1966: 286. Canada (BC).*Geocoris bullatus* (Say) (Hemiptera, Lygaeidae): Clancy and Pierce 1966: 857-858. USA(CA).*Geocoris punctipes* (Say) (Hemiptera, Lygaeidae): Clancy and Pierce 1966: 857-858. USA (CA).*Geocoris uliginosus* (Say) (Hemiptera, Lygaeidae): Clancy and Pierce 1966: ?. USA (CA).*Nysius angustatus* Uhler (Hemiptera, Lygaeidae): New record. USA (KS, Garden City).*Nysius raphanus* Howard (Hemiptera, Lygaeidae): Clancy and Pierce 1966: 858. USA (CA).*Nysius ericae* (Schilling) [= *Nysius niger* Baker] (Hemiptera, Lygaeidae): Bird and Mitchener 1953: 44 (as "*Hyalomyopsis*" probable). USA (NMSA).*Lygus linolaris* (Palisot) (Hemiptera, Miridae): New record. USA (NJ, Moorestown).***Phasia argentifrons****Acathomia horrida* (Hemiptera): New record. Tanzania.***Phasia aurigera****Palomena prasina* (L.) (Hemiptera, Pentatomidae): Michalk 1938a: 259, 1938b: 57; Dupuis 1947: 302, 1948: 206, 1963: 106; Draber-Moňko 1965: 145. Europe.*Rhaphigaster nebulosa* (Poda) (Hemiptera, Pentatomidae): Dupuis 1949a: 215, 1949b: 504, 1963: 106; Draber-Moňko 1965: 145. Europe.*Coreus marginatus* (L.) (Hemiptera, Coreidae): Dupuis 1954: 332, 1963: 106; Draber-Moňko 1965: 145. Europe.*Gonocerus juniperi* (H.S.) (Hemiptera, Coreidae): Dupuis 1954: 332, 1963: 106; Draber-Moňko 1965: 145. Europe.*Gonocerus acuteangulatus* (Goeze) (Hemiptera, Coreidae): Dupuis 1963: 106; Draber-Moňko 1965: 145. Europe.***Phasia aurulans****Elasmucha lateralis* (Say) (Pentatomidae: Acathosomatine): New record. USA (SC).***Phasia cana****Spilostethus pandurus* (Scopoly) (Hemiptera, Lygaeidae): New record. South Africa.*Dysdercus supersticiosus* (F.) (Hemiptera, Pyrrhocoridae): New record. Zimbabwe.***Phasia chilensis****Chlorochroa ligata* Say (Hemiptera, Pentatomidae): Brooks 1945: 660. USA (TX) .*Thyanta pallido-virens* (Stal.) (Hemiptera, Pentatomidae): New record. USA (TX).*Dysdercus* sp. (Hemiptera, Pyrrhocoridae): Townsend 1937: 318; Thompson 1950: 44. Peru (Barranca), Uruguay (Montevideo), Brazil (Campinas).*Dysdercus ruficollis* (Linnaeus)(Hemiptera, Pyrrhocoridae): Uruguay (Montevideo), Argentinian (Santiago del Estero), Peru (Lima).*Leptoglossus chilensis* Berg. (Hemiptera, Coreidae): Chile (Panguehue).*Largus cinctus* Herrich-Schaeffer, 1842 (Hemiptera, Largidae): Brazil (Mato Grosso).***Phasia clavigralla****Clavigralla elongata* Signoret (Hemiptera, Coaeidae): New record. Tanzania.

***Phasia campbelli***

*Nysius* sp. (Hemiptera, Lygaeidae): New record. New Zealand (reared by M. Stufkens).

***Phasia diversa***

*Euschistus servus euschistoides* (Vollenhoven) (Hemiptera, Pentatomidae): New record. USA.

***Phasia hemiptera***

*Tropicoris rufipes* (L.) (Hemiptera, Pentatomidae): Dupuis 1960: 1746, 1963: 107; Draber-Mońko 1965: 133. Europe.

*Palomena prasina* (L.) (Hemiptera, Pentatomidae): Dupuis 1960: 1746, 1963: 107; Draber-Mońko 1965: 133. Europe.

*Pentatoma metalifera* (Motshulsky.) (Hemiptera, Pentatomidae): Draber-Mońko 1965: 133. Russia.

***Phasia indica***

*Bagrada picta* (Fabr.) (Hemiptera, Pentatomidae): Mesnil 1953: 177; Draber-Mońko 1965: 101; Crosskey 1976: 291. India

*Bagrada hilaris* (Burm.) (Hemiptera, Pentatomidae): Crosskey 1976: 291. India.

***Phasia lepidofera***

*Nysius vinitor* Bergroth (Hemiptera, Lygaeidae): Crosskey 1973: 179. Australia

*Nysius clevelandensis* Evans (Hemiptera, Lygaeidae): New record. Australia (New South Wales).

*Oxycarenus luctuosus* (Montrouzier) (Hemiptera, Lygaeidae): New record. Australia (Queensland).

***Phasia mesnili***

*Eysarcoris ventralis* (Westwood) (Hemiptera, Pentatomidae): Draber-Mońko 1965: 112; Ziegler 1994: 168. Palaearctic.

*Eysarcoris aeneus* (Scopoli) (Hemiptera, Pentatomidae): Draber-Mońko 1965: 112; Ziegler 1994: 168. Palaearctic.

***Phasia multisetosa***

*Dysdercus supersticiosus* F. (Hemiptera, Pyrrhocoridae): Emden 1945: 432. Nigeria.

*Dysdercus* sp. (Hemiptera, Pyrrhocoridae): New record. Tanzania.

***Phasia nasalis***

*Acanthomia tomentosicollis* Stal (Hemiptera:Coreidae): New record. Nigeria.

*Agonoscelis versicolor* (Fab.) (Hemiptera:Pentatomidae): Emden 1945: 432. Kenya.

*Agonoscelis puberula* (Hemiptera): New record. Kenya.

*Dysdercus fasciatus* Sign., (Hemiptera, Pyrrhocoridae): Emden 1945: 432; Thompson 1950: 44. Zimbabwe, South Africa.

*Dysdercus intermedius* Dist., (Hemiptera, Pyrrhocoridae): Emden 1945: 432; Thompson 1950: 44. Africa.

*Dysdercus supersticiosus* F., (Hemiptera, Pyrrhocoridae): Emden 1945: 432; Thompson 1950: 44. Kenya, Nigeria.

***Phasia nasuta***

*Sladioli* sp (Hemiptera): New record. Zimbabwe.

*Scantius forsteri* var. *centralis* Sign. (Hemiptera, Pyrrhocoridae): new record. South Africa.

***Phasia obesa***

*Zicrona caerulea* (L.) (Hemiptera, Pentatomidae): Dupuis 1949: 505; 1963: 105; Draber-Mońko 1965: 78. Palaearctic.

*Leptopterna dolabrata* (L.) (Hemiptera, Miridae): Southwood and Leston 1959: 313; Dupuis 1963: 105; Draber-Mońko 1965: 78. Palaearctic.

*Lygus pratensis* (L.) (Hemiptera, Miridae): Dupuis 1963: 105; Draber-Mońko 1965: 78. Palaearctic.

*Myrmus miriformis* (Fallen) (Hemiptera, Rhopalidae): Dupuis 1963: 105; Draber-Mońko 1965:

78. Palaearctic.

*Beosus maritimus* (Scopoli) (Hemiptera, Lygaeidae): Dupuis 1963: 105; Draber-Moňko 1965:

78. Palaearctic.

*Lygus rugulipennis* Poppins (Hemiptera, Miridae): New record. France.

*Lygus* sp., (Hemiptera, Miridae): New record. France (Fontainebleau), Austria (Raidina and Underfravenhaid).

\**Hypera postica* (Gyllenhal) (Coleoptera, Curculionidae): France (Colmar).

***Phasia purpurascens***

*Sehirus cinctus* Palisot (Hemiptera, Cydnidae): Brooks 1945: 676; Arnaud 1978: 283. USA (CA, GA).

*Nysius angustatus* Uhler (Hemiptera, Lygaeidae): New record. USA (KS).

*Lygus lineolaris* (Palisot de Beauvois) (Hemiptera, Miridae): New record. USA (MO, NJ).

***Phasia pusilla***

*Chilacis typhae* (Perr.) (Hemiptera, Lygaeidae): Hesse 1927; Michalk 1935; Dupuis 1963: 105; Draber-Moňko 1965: 87. Palaearctic.

*Aethus nigrinus* (Fabr.) (Hemiptera, Cydnidae): Michalk 1938; Otten 1940: 324; Dupuis 1963: 105; Draber-Moňko 1965: 87. Palaearctic.

*Stollia inconspicua* (H.S.) (Hemiptera, Pentatomidae): Viktorov and Kozharina 1961: 53; Dupuis 1963: 105. Palaearctic.

*Stollia aenea* (Scopoli) (Hemiptera, Pentatomidae): Viktorov and Kozharina 1961: 53; Dupuis 1963: 105. Palaearctic.

*Lyctocoris campestris* (F.) (Hemiptera, Anthocoridae): Dupuis 1963: 105. Palaearctic.

*Anthocoris sarothamni* Douglas and Scott (Hemiptera, Anthocoridae): Dupuis 1963: 105. Palaearctic.

*Anthocoris nemoralis* (F.) (Hemiptera, Anthocoridae): Dupuis 1963: 105. Palaearctic.

*Nysius cymoides* (Spinola) (Hemiptera, Lygaeidae): Dupuis 1963: 105. Palaearctic.

*Nysius lineatus* (Costa) (Hemiptera, Lygaeidae): Dupuis 1949: 223, 1963: 105; Draber-Moňko 1965: 87. Palaearctic.

*Cymus grandicolor* Hahn., (Hemiptera, Lygaeidae): Dupuis 1963: 105; Draber-Moňko 1965: 87. Palaearctic.

*Kleidocerus ericae* (Horv.), (Hemiptera, Lygaeidae): Dupuis 1963: 105; Draber-Moňko 1965: 87. Palaearctic.

*Nysius jacobae* (Schill.) (Hemiptera, Lygaeidae): Dupuis 1963: 105; Draber-Moňko 1965: 87. Palaearctic.

*Bagrada hilaris* (Burm.) (Hemiptera, Pentatomidae): Anwar Cheema et al 1973; Crosskey 1976: 291. India.

***Phasia robertsonii***

*Adelphocoris lineolatus* (Goeze) (Hemiptera, Miridae): Day 1995: 102. USA (NJ).

*Leptopterna dolabrata* (Linnaeus) (Hemiptera, Miridae): Day 1995: 102. USA (IL, NJ, NY).

*Lygocoris caryae* (Knight) (Hemiptera, Miridae): Arnaud 1978: 59,60; Brooks 1945: 666. USA (NY).

*Cosmopepla bimaculata* Thomas (Hemiptera, Miridae): Arnaud 1978: 59; Clance and Pierce 1966: 857. USA (NY).

*Lygus lineolaris* (Palisot de Beauvois) (Hemiptera, Miridae): Arnaud 1978: 59,60; Clancy and Pierce 1966: 855, 857; Day 1995. USA (AK, NY, NJ, WI, MS, MI, MO), Canada (ON).

*Holcostethus limbolaris* Stal (Hemiptera, Pentatomidae): Arnaud 1978: 60; Clancy and Pierce 1966: 857. USA (OH).

*Megaloceroea recticornis* (Geoffroy) (Hemiptera, Miridae): Day 1995: 102. USA (NJ).

*Podisus* sp. (Hemiptera, Pentatomidae): USA (GA).

*Sinea spinipes* (Herrich-Schaeffer) (Hemiptera, Reduviidae): USA (GA).



*Stenotus binotatus* (F.) (Hemiptera, Miridae): Day 1995: 102. USA (NJ).

*Trigonotylus coelestialium* (Kirkaldy) (Hemiptera, Miridae): Day 1995: 102. USA(NJ).

\**Hypera postica* (Gyllenhal) (Coleoptera, Curculionidae): New record. USA (NJ).

\**Philaenus leucophthalmus* Linnaeus (Homoptera, Cercopidae): New record. USA (PA).

***Phasia robusta***

*Lygaeus kalmii* Stal. (Hemiptera, Lygaeidae): New record. USA (OR, CA, KS).

***Phasia rotundata***

*Serinetha mitellata* (Hemiptera, Coreidae): New record. Australia (New South Wales).

***Phasia rufiventris***

*Oncopeltus sordidus* (Hemiptera, Lygaeidae): Cantrell 1986: 259. Australia.

*Dysdercus sidae* Montrouzier (Hemiptera, Pyrrhocoridae): Thompson 1950: 44; Crosskey 1973: 179. Australia.

*Melamphaus faber* F. (Hemiptera, Pyrrhocoridae): Thompson 1950: 74. Malaysia.

***Phasia sensua***

*Eysarcoris trimaculatus* (= *Stollia trimaculatas*) (Distant) (Hemiptera, Pentatomidae): New record. Australia (South Australia).

***Phasia subcoleoptrata***

*Eurygaster integriceps* Puton (Hemiptera, Scutelleridae): Yakhontov 1929: 28; de Fedotov 1944: 134, 1947: 50; de Rubtzov 1945: 150, 1947: 85; de Tchernova 1947: 73; Schumakov 1951; Thompson 1950: 50; Kamenkova 1956: 327; Lodos 1952: 23; Dupuis 1963: 106; Draber-Moňko 1965: 126. Palaeartic.

*Dolycoris baccarum* (L.) (Hemiptera, Pentatomidae): Kamenkova 1956: 328; Viktorov and Kozharina 1961: 53; Dupuis 1963: 106; Draber-Moňko 1965: 126. Palaeartic.

*Dolycoris numidicus* (Horváth) (Hemiptera, Pentatomidae): Dupuis 1963: 106; Draber-Moňko 1965: 126. Palaeartic.

*Stagonomus amoenus* Brullé (Hemiptera, Pentatomidae): Dupuis 1963: 106; Draber-Moňko 1965: 126. Palaeartic.

***Phasia subopaca***

*Cosmopepla bimaculata* (Thomas) (Hemiptera, Pentatomidae): New record. Canada (ON, reared by E. Lippert and S. Marshall).

*Phymata americana* Melin (Hemiptera, Phymatidae): New record. Canada (ON, reared by E. Lippert and S. Marshall).

***Phasia triangulata***

*Leptocoris augur* (Fabricius) (Hemiptera, Rhopalidae): New record. India.

***Phasia varicolor***

*Dysdercus sidae* Montrouzier (Hemiptera, Pyrrhocoridae): Crosskey 1973: 179. Australia.

*Dysdercus koanigii* Fabr. (Hemiptera, Pyrrhocoridae): New record. India.

*Dysdercus cingulatus* Fabr. (Hemiptera, Pyrrhocoridae): New record. Sri Lanka.

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## About the authors

Xuekui Sun is a research associate of the University of Guelph Insect Collection. He received his doctoral degree at University of Guelph, Canada and his Master's degree from the Chinese Academy of Sciences, China. His research interests include systematics of Tachinidae (Diptera) and behavior of parasitic flies.

Stephen A. Marshall is a professor in the Department of Environmental Biology, University of Guelph where he studies the systematics of various groups of flies, especially Sphaeroceridae and Micropezidae.