

The systematics of the pseudoscorpion family Ideoroncidae (Pseudoscorpiones: Neobisioidea) in the Asian region

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Abstract. A review of the pseudoscorpion family Ideoroncidae in the Asian region reveals three genera: *Dhanus* Chamberlin, 1930, *Shravana* Chamberlin, 1930 and a new genus. *Dhanus* includes four species, *D. sumatranus* (Redikorzev, 1922), *D. hashimi* sp. nov. and *D. tioman* sp. nov. from Malaysia, and *D. lunaris* sp. nov. from Cambodia. *Dhanus doveri* Bristowe, 1952 is newly synonymized with *D. sumatranus*, and the type locality of *D. sumatranus* is confirmed as the Dark Cave, in the Batu Cave system, near Kuala Lumpur. *Shravana* is confirmed as a senior synonym of *Nhatrangia* Redikorzev, 1938 and includes 13 species: *S. laminata* (With, 1906) and *S. schwendingeri* sp. nov., from Thailand, *S. charas* sp. nov. and *S. withi* sp. nov. from Malaysia, *S. dawydoffi* (Redikorzev, 1938), comb. nov. (transferred from *Nhatrangia*) from Cambodia, Laos, Vietnam and the Spratly Islands, *S. indica* (Murthy & Ananthkrishnan, 1977), comb. nov. (transferred from *Dhanus*), *S. ceylonensis* (Mahnert, 1984), comb. nov. (transferred from *Nhatrangia*) from Sri Lanka, *S. afghanica* (Beier, 1959), comb. nov. (transferred from *Dhanus*) and *S. magnifica* sp. nov. from Afghanistan, *S. latens* sp. nov. from Iran, and *S. pohli* (Mahnert, 2007), comb. nov. (transferred from *Dhanus*), *S. socotraensis* (Mahnert, 2007), comb. nov. (transferred from *Dhanus*), and *S. taitii* (Mahnert, 2007), comb. nov. (transferred from *Dhanus*) from Socotra. A new genus, *Sironcus*, is described for the type species *Ideobisium (Ideoroncus) siamensis* With, 1906 from Thailand and five new species, *S. rhodontus* sp. nov. and *S. stonei* sp. nov. from Thailand, *S. sierwaldae* sp. nov. from Thailand and Myanmar, *S. jera* sp. nov. from northern peninsular Malaysia and *S. belaga* sp. nov. from Sarawak.

Keywords: *Nhatrangia*, morphology, new species, post-embryonic development

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The pseudoscorpion family Ideoroncidae is discontinuously distributed around the world with 71 described species in the Americas, Africa and Asia (Harvey 2013; Harvey & Muchmore 2013; Harvey & Du Preez 2014). The American fauna consists of 43 species in seven genera, *Albiorix* Chamberlin, 1930, *Ideoroncus* Balzan, 1887, *Mahnertius* Harvey & Muchmore, 2013, *Muchmoreus* Harvey, 2013, *Pseudalbiorix* Harvey, Barba, Muchmore & Perez, 2007, *Typhloroncus* Muchmore, 1979, and *Xorilbia* Harvey & Mahnert, 2006, ranging from the western U.S.A. to central Chile (Harvey & Muchmore 2013). The African fauna consists of 16 species in four genera, *Botswanaoncus* Harvey & du Preez, 2014, *Negroroncus* Beier, 1931, *Nannoroncus* Beier, 1955 and *Afroroncus* Mahnert, 1981 (Harvey 2013; Harvey & Du Preez 2014). The remaining 11 species are found in the Asian region occurring as far west as Socotra and Iran, and as far east as Malaysia, and are currently placed in a further three genera, *Dhanus* Chamberlin, 1930, *Nhatrangia* Redikorzev, 1938 and *Shravana* Chamberlin, 1930 (Harvey 2013). The first ideoroncids described from Asia were *Ideobisium (Ideoroncus) siamensis* With, 1906 and *Ideobisium (Ideoroncus) laminatus* With, 1906 from Thailand (With 1906), followed by *Ideoroncus sumatranus* Redikorzev, 1922 from ‘Datu Caves, Sumatra’ (Redikorzev 1922). These species were later transferred to other genera, with *I. siamensis* and *I. sumatranus* comprising the genus *Dhanus*, and *I. laminatus* the sole species of *Shravana* (Chamberlin 1930). *Nhatrangia* was erected by Redikorzev (1938) for *N. dawydoffi* Redikorzev, 1938

from Vietnam, and the genus now includes a second species, *N. ceylonensis* Mahnert, 1984 from Sri Lanka (Mahnert 1984). Several additional species have since been added to *Dhanus*, including *D. doveri* Bristowe, 1952 from Batu Caves, Malaysia (Bristowe 1952), *D. afghanicus* Beier, 1959 from Afghanistan and Iran (Beier 1959, 1971), *D. indicus* Murthy and Ananthkrishnan, 1977 from southern India (Murthy & Ananthkrishnan 1977), and *D. pohli* Mahnert, 2007, *D. socotraensis* Mahnert, 2007 and *D. taitii* Mahnert, 2007 from Socotra (Mahnert 2007). The Asian ideoroncids occur in several disparate areas in Asia, where they occupy a number of habitats such as rainforests, caves and semi-arid regions.

A review of the generic classification of the Ideoroncidae by Mahnert (1984) placed particular emphasis on trichobothriotaxy and highlighted many deficiencies in our knowledge of the systematics of this well-defined family (Harvey 1992). Unfortunately, specimens of *Dhanus sumatranus*, the type species of the genus, were unavailable to Mahnert (1984) and all previous descriptions of the species (Redikorzev 1922; Chamberlin 1930; Beier 1932b) have proved to be inadequate by modern standards. The lack of a suitable description for this species has hampered our understanding of the relationships of the other Asian ideoroncids, and the description presented below based on a syntype of *D. sumatranus*, the three specimens examined by Chamberlin (1930) and numerous newly collected specimens from the type locality that allows some firm decisions to be made regarding the status of *Dhanus*, *Shravana* and



Figure 1.—*Dhanus sumatranus* (Redikorzev), from Gua Pandan, Batu Caves, Malaysia: A. Adult; B. Two adults, one feeding on a juvenile cave cockroach, *Pycnoscelus striata* (Kirby).

Nhatrangia. In addition, the generic placement of *D. siamensis* is reassessed, which is found to be sufficiently distinct from both *Dhanus* and *Shravana* to warrant a new genus, *Sironcus*.

METHODS

The specimens examined for this study are lodged in the following institutions: Australian National Insect Collection, CSIRO, Canberra (ANIC); Museum of Natural History, London (BMNH); Bishop Museum, Honolulu (BPBM); California Academy of Sciences, California (CAS); Muséum d'histoire naturelle, Genève (MHNG); Muséum national d'histoire naturelle, Paris (MNHN); Naturhistorisches Museum, Wien (NHMW); Staatliches Museum für Naturkunde, Stuttgart (SMNS); Western Australian Museum, Perth (WAM); Zoological Institute of the Russian Academy of Sciences, St Petersburg (ZISP); Zoological Museum of the University of Malaya, Kuala Lumpur (ZMUM; currently lodged in WAM); and Zoologisk Museum, Copenhagen (ZMC).

The specimens were examined by preparing temporary slide mounts by immersing the specimen in 75% lactic acid at room temperature for one to several days, and mounting them on microscope slides with 10 or 12 mm coverslips supported by small sections of 0.25 mm or 0.50 mm diameter nylon fishing line. Specimens were examined with a Leica MZ16 dissecting microscope, Leica DM2500 or Olympus BH-2 compound microscopes, and illustrated with the aid of a drawing tube. Measurements were taken at the highest possible magnification using an ocular graticule. After study, the specimens were rinsed in water and returned to 75% ethanol with the dissected portions and placed in 12 × 3 mm glass genitalia microvials (BioQuip Products, Inc.).

The setae of the carapace are shown as a solid line if present, but depicted with a dashed line if the seta was missing from the specimen. Other small dots depicted in the illustrations are small pores, and not setal areolae.

The genera and species treated in this monograph are arranged alphabetically. Terminology and mensuration largely follow Chamberlin (1931), with the exception of the nomenclature of the pedipalps, legs and with some minor modifications to the terminology of the trichobothria (Harvey 1992), chelicera (Harvey & Edward 2007; Judson 2007) and faces of the appendages (Harvey et al. 2012). The notation of the supernumerary trichobothria follows (Mahnert 1984).

Coordinates for the collection localities were calculated using Google Earth or obtained from various other on-line resources. Maps throughout this publication were created using ArcGIS® software by Esri (www.esri.com).

SYSTEMATICS

Family Ideoroncidae Chamberlin, 1930

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:3D32F8DC-8B61-404C-B9D7-921922DACE5F>

Ideoroncidae Chamberlin, 1930: 42.

Diagnosis.—Members of the family Ideoroncidae differ from all other pseudoscorpion families by the increased number of chelal trichobothria (17–31 on the fixed chelal finger and 9–14 on the movable chelal finger) (e.g., Figs. 3, 10, 24C), and the sub-basal position of the median maxillary lyrifissure (Figs. 4A, 11A, 23A).

Description.—See Harvey & Muchmore (2013).

Post-embryonic development.—Of the three genera treated in this paper, nymphal stages are known for 15 species, including the tritonymph and deutonymph of *Dhanus hashimi* sp. nov., *D. tioman* sp. nov., *Shravana afghanica*, *S. ceylonensis*, *S. magnifica* sp. nov., *S. schwendingeri* sp. nov. and *Sironcus rhiodontus* sp. nov., the tritonymph of *D. sumatranus*, *S. latens* sp. nov., *S. taitii* sp. nov., *S. withi* sp. nov. and *S. stonei* sp. nov., the deutonymph of *S. charas* sp. nov. and *S. socotraensis*, and all three nymphal stages of *Sironcus jerai* sp. nov. (Table 1). As in all other pseudoscorpions (e.g., Vachon 1964), trichobothrial numbers increase at each stage. Protonymphs of *S. jerai* have three trichobothria on the fixed finger and one trichobothrium on the movable finger, forming a pattern of 3/1. Several trichobothria are added at the deutonymph stage, forming a pattern of 9/6, at the tritonymph stage forming 14/8, and finally at the adult forming 20/10. This 20/10 pattern, and the highly similar 21/10 and 22/10, are the most common patterns among the Ideoroncidae, and are also found in *Afroroncus* (Mahnert 1981), *Albiorix* (Harvey & Muchmore 2013), *Ideoroncus* (Mahnert 1984), *Mahnertius* (Harvey & Muchmore 2013), *Muchmoreus* (Harvey & Muchmore 2013), *Nannoroncus* (Mahnert 1981), *Negroroncus* (except *N. jeanneli* Vachon, 1958) (Mahnert 1981), *Pseudalbiorix* (Harvey et al. 2007), *Typhlo-*

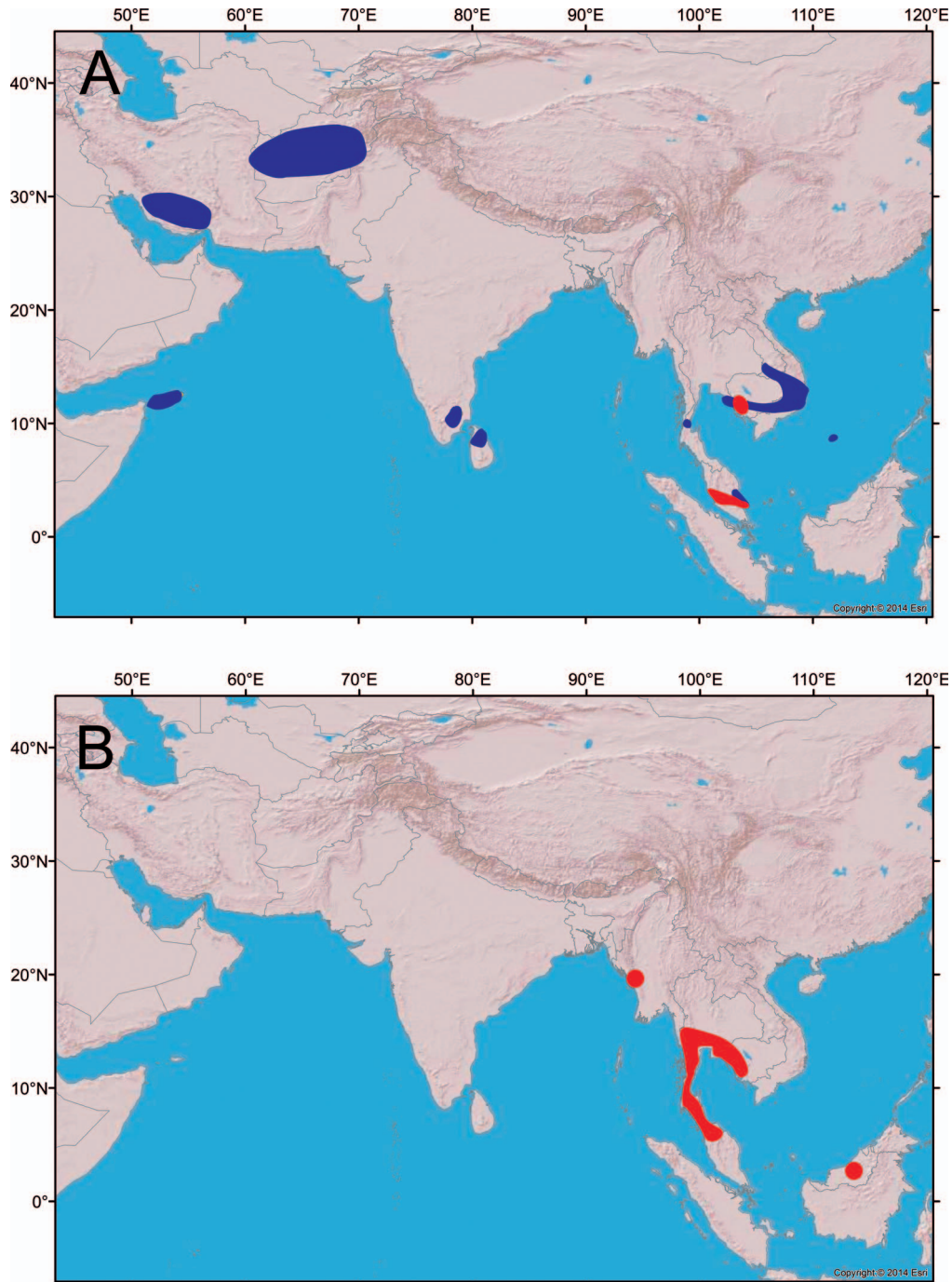


Figure 2.—Distribution of Asian Ideoroncidae: A. *Shravana* species (blue), *Dhanus* species (red); B. *Sironcus* species.

roncus (Harvey & Muchmore 2013) and *Xorilbia* (Mahnert 1984, 1985), as summarized in Harvey and Du Preez (2014). Lower numbers are found in *Botswanonus* which has 17/9 (Harvey & Du Preez 2014), and higher numbers occur in *Negroroncus jeanneli*, all species of *Dhanus* and all species of *Shravana* except *S. socotraensis* (Vachon 1958; Mahnert 1984; 2007; this study). The generally high adult trichobothrial numbers of species of *Dhanus* and *Shravana* are reflected in the deutonymph and tritonymph patterns which are generally higher than those found in other ideoroncids, with deuto-

nymphs having 10–20/7–10 trichobothria and tritonymphs with 16–25/8–12. Deutonymphs of other genera have 9/6 (10 species in eight genera, including *S. socotraensis*), and tritonymphs have 14/8 or 15/8 (20 species in 8 genera). Protonymphs of only seven ideoroncid species are known, *Albiorix chilensis* (Ellingsen, 1905), *Ideoroncus setosus* Mahnert, 1984, *Negroroncus* sp., *Pseudalbiorix reddelli* (Muchmore, 1982), *Sironcus jerai*, *Xorilbia arboricola* (Mahnert, 1979) and *X. gracilis* (Mahnert, 1985) (Mahnert 1981, 1984; Harvey et al. 2007; Harvey & Muchmore 2013), and all have a 3/1 pattern. It seems quite likely that

Table 1.—The number of trichobothria occurring in species of *Dhanus*, *Shravana* and *Sironcus*, including known nymphal stages.

| | <i>eb</i> | <i>esb</i> | <i>est</i> | <i>et</i> | <i>ib</i> | <i>isb</i> | <i>ist</i> | <i>it</i> | <i>b</i> | <i>sb</i> | <i>st</i> | <i>t</i> | Fixed finger, total | Movable finger, total | Reference |
|-------------------------------|-----------|------------|------------|-----------|-----------|------------|------------|-----------|----------|-----------|-----------|----------|---------------------------|-----------------------------|--|
| <i>Dhanus hashimi</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6–7 | 1 | 5 | 1 | 7 | 1 | 3 | 1 | 1 | 6 | 23–24 | 11 | This study |
| Tritonymph | 1 | 1 | 4 | 1 | 4 | - | 4 | 1 | 3 | - | 1 | 5 | 16 | 9 | This study |
| Deutonymph | 1 | - | 3 | 1 | 2 | - | 2 | 1 | 3 | - | - | 4 | 10 | 7 | This study |
| <i>Dhanus lunaris</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 8 | 1 | 6 | 1 | 9 | 1 | 4 | 1 | 1 | 6 | 29 | 12 | This study |
| <i>Dhanus sumatranus</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6–8 | 1 | 5 | 1 | 7–9 | 1 | 3 | 1 | 1 | 6 | 24–26 | 11 | This study |
| Tritonymph | 1 | 1 | 5 | 1 | 4 | - | 4 | 1 | 3 | - | 1 | 5 | 17 | 9 | This study |
| <i>Dhanus tioman</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 9 | 1 | 7 | 1 | 9 | 1 | 4 | 1 | 1 | 7 | 31 | 13 | This study |
| Tritonymph | 2 | 1 | 7 | 1 | 5 | - | 6 | 1 | 4 | - | 1 | 7 | 23 | 12 | This study |
| Deutonymph | 2 | - | 5 | 1 | 4 | - | 3 | 1 | 4 | - | - | 6 | 16 | 10 | This study |
| <i>Shravana afghanica</i> | | | | | | | | | | | | | | | |
| Adult | 3 | 1 | 12 | 1 | 4–5 | 1 | 8–9 | 1 | 4 | 1 | 1 | 8 | 32 | 14 | This study |
| Tritonymph | 3 | 1 | 7 | 1 | 4 | - | 7 | 1 | 4 | - | 1 | 6 | 24 | 11 | This study |
| Deutonymph | 3 | - | 6 | 1 | 3 | - | 5 | 1 | 4 | - | - | 6 | 19 | 10 | This study |
| <i>Shravana ceylonensis</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 9 | 1 | 6 | 1 | 9 | 1 | 4 | 1 | 1 | 8 | 30 | 14 | Mahnert (1984) |
| Tritonymph | 2 | 1 | 7 | 1 | 4 | - | 6 | 1 | 4 | - | 1 | 7 | 22 | 12 | Mahnert (1984) |
| Deutonymph | 2 | - | 4 | 1 | 4 | - | 4 | 1 | 4 | - | - | 6 | 16 | 10 | Mahnert (1984) |
| <i>Shravana charas</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 9 | 1 | 6 | 1 | 11 | 1 | 4 | 1 | 1 | 8 | 32 | 14 | This study |
| Deutonymph | 2 | - | 5 | 1 | 3 | - | 4 | 1 | 4 | - | - | 6 | 16 | 10 | This study |
| <i>Shravana dawydoffi</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 9 | 1 | 5–6 | 1 | 9–10 | 1 | 4 | 1 | 1 | 8 | 29–31 | 14 | Mahnert (1984) |
| <i>Shravana indica</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 5 | 1 | 7 | 1 | 3 | 1 | 1 | 7 | 23 | 12 | This study |
| <i>Shravana laminata</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 5 | 1 | 7 | 1 | 3 | 1 | 1 | 7 | 23 | 12 | Mahnert (1984) |
| <i>Shravana latens</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 8 | 1 | 5 | 1 | 9 | 1 | 3 | 1 | 1 | 7 | 28 | 12 | This study |
| Tritonymph | 2 | 1 | 6 | 1 | 4 | - | 7 | 1 | 3 | - | 1 | 6 | 22 | 10 | This study |
| <i>Shravana magnifica</i> | | | | | | | | | | | | | | | |
| Adult | 3 | 1 | 13 | 1 | 5 | 1 | 8–9 | 1 | 4 | 1 | 1 | 8 | 31–32 | 14 | This study |
| Tritonymph | 3 | 1 | 8 | 1 | 4 | - | 7 | 1 | 4 | - | 1 | 7 | 25 | 11 | This study |
| Deutonymph | 2 | - | 6 | 1 | 3 | - | 6 | 1 | 4 | - | - | 6 | 20 | 10 | This study |
| <i>Shravana pohli</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 6 | 1 | 5–6 | 1 | 6 | 1 | 2 | 1 | 1–2 | 7 | 23–24 | 11–12 | Mahnert (2007); Mahnert (in litt., April 2016) |
| <i>Shravana schwendingeri</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 5 | 1 | 7 | 1 | 3 | 1 | 1 | 6 | 23 | 11 | This study |
| Tritonymph | 1 | 1 | 5 | 1 | 4 | - | 3 | 1 | 3 | - | 1 | 5 | 16 | 8 | This study |
| Deutonymph | 1 | - | 3 | 1 | 2 | - | 2 | 1 | 3 | - | - | 4 | 10 | 7 | This study |
| <i>Shravana socotraensis</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | Mahnert (2007) |
| Deutonymph | ? | - | ? | 1 | ? | - | ? | 1 | ? | - | - | ? | 9 | 6 | Mahnert (2007) |
| <i>Shravana taitii</i> | | | | | | | | | | | | | | | |
| Adult | 2 | 1 | 8 | 1 | 4 | 1 | 7 | 1 | 3 | 1 | 1 | 7 | 25 | 12 | Mahnert (2007) |
| Tritonymph | 2 | 1 | 6 | 1 | 4 | - | 4 | 1 | 3 | - | 1 | 5 | 19 | 9 | Mahnert (2007) |
| <i>Shravana withi</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 5 | 1 | 8 | 1 | 3 | 1 | 1 | 7 | 24 | 12 | This study |
| Tritonymph | 1 | 1 | 5 | 1 | 4 | - | 3 | 1 | 3 | - | 1 | 6 | 16 | 10 | This study |
| <i>Sironcus belaga</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | This study |
| <i>Sironcus jerai</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | Harvey (1992); this study |
| Tritonymph | 1 | 1 | 3 | 1 | 3 | - | 4 | 1 | 2 | - | 1 | 5 | 14 | 8 | Harvey (1992); this study |
| Deutonymph | 1 | - | 2 | 1 | 2 | - | 2 | 1 | 2 | - | - | 4 | 9 | 6 | Harvey (1992); this study |
| Protonymph | 1 | - | - | 1 | - | - | 1 | - | - | - | - | 1 | 3 | 1 | Harvey (1992); this study |

Table 1.—Continued.

| | <i>eb</i> | <i>esb</i> | <i>est</i> | <i>et</i> | <i>ib</i> | <i>isb</i> | <i>ist</i> | <i>it</i> | <i>b</i> | <i>sb</i> | <i>st</i> | <i>t</i> | Fixed finger, total | Movable finger, total | Reference |
|----------------------------|-----------|------------|------------|-----------|-----------|------------|------------|-----------|----------|-----------|-----------|----------|---------------------------|-----------------------------|------------|
| <i>Sironcus rhiodontus</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | This study |
| Tritonymph | 1 | 1 | 3 | 1 | 3 | - | 4 | 1 | 2 | - | 1 | 5 | 14 | 8 | This study |
| Deutonymph | 1 | - | 2 | 1 | 2 | - | 2 | 1 | 2 | - | - | 4 | 9 | 6 | This study |
| <i>Sironcus siamensis</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | This study |
| <i>Sironcus sierwaldae</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | This study |
| <i>Sironcus stonei</i> | | | | | | | | | | | | | | | |
| Adult | 1 | 1 | 6 | 1 | 4 | 1 | 5 | 1 | 2 | 1 | 1 | 6 | 20 | 10 | This study |
| Tritonymph | 1 | 1 | 3 | 1 | 3 | - | 4 | 1 | 2 | - | 1 | 5 | 14 | 8 | This study |

KEY TO GENERA OF IDEORONCIDAE

1. Chelal fingers with stout, mesal setae; rallum with two distal-most blades serrate, other blades smooth..... 2
Chelal fingers without stout, mesal setae; rallum with all blades serrate (e.g., Figs. 14E, 27C)..... 3
2. Trichobothria *b* virtually adjacent and quite close to *sb* *Nannoroncus* (East Africa)
Trichobothria *b* somewhat separated and far from *sb* *Afroroncus* (East Africa)
3. Arolium with small hooked process on ventral surface (e.g., Fig. 27H) 4
Arolium without small hooked process on ventral surface (e.g., Figs. 8J, 17E)..... 8
4. Distal teeth of fixed chelal finger raised into a short ridge *Mahnerti* (South America)
Distal teeth of fixed chelal finger not raised into a short ridge 5
5. Anal operculum abutting sternite X *Typhloroncus* (Central America)
Anal operculum not abutting sternite X 6
6. Chelal teeth juxtadentate (contiguous) 7
Chelal teeth diastemodentate (widely spaced) *Xorilbia* (South America)
7. Lamina exterior present *Negroroncus* (central and eastern Africa)
Lamina exterior absent (Fig. 27B) *Sironcus* (south-east Asia)
8. Condyle on external margin of chelal hand small and rounded 9
Condyle on external margin of chelal hand large and bifurcate *Pseudalbiorix* (Central America)
9. Lamina exterior present (e.g., 8F, 14D) 10
Lamina exterior absent 11
10. Arolium shorter than claws or as long as claws (e.g., Fig. 8J) *Dhanus* (south-east Asia)
Arolium extending beyond claws (e.g., Fig. 17E)..... *Shravana* (Socotra to south-east Asia)
11. Chelal fingers with 26 trichobothria, 17 on fixed finger and 9 on movable finger *Botswanoncus* (southern Africa)
Chelal fingers with 30–32 trichobothria, 20–22 on fixed finger and 10 on movable finger 12
12. Arolium divided, much longer than claws *Albiorix* (Americas)
Arolium undivided, slightly longer than claws or about same length as claws 13
13. Sternites with median suture line; each spiracular plate with 1 seta *Ideoroncus* (South America)
Sternites without median suture line; each spiracular plate with 2 or 3 setae *Muchmoreus* (Central America)

protonymphs of *Dhanus* and *Shravana* will also have a 3/1 pattern.

Dhanus Chamberlin, 1930

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:914CD39F-6BB5-4C07-B18B-82E00FDFC748>

Dhanus Chamberlin, 1930:47; Beier, 1932a:173; Murthy and Ananthakrishnan, 1977:26; Harvey, 1991:318; Harvey, 2013: unpaginated.

Type species.—*Ideoroncus sumatranus* Redikorzev, 1922, by original designation.

Diagnosis.—Species of *Dhanus* differ from all other genera except *Shravana* and *Negroroncus* by the presence of a thin lamina exterior on the chelicera (e.g., Figs. 8F, 14D). They differ from *Shravana* by the short arolium (e.g., Figs. 6, 8), and from *Negroroncus* by the lack of a ventral hooked process on the arolium (e.g. Figs. 6, 8).

Description (adult).—*Setae*: generally long, straight or slightly curved, and acicular.

Chelicera (Figs. 6B, 7C, 8F): hand with 7–9 long, acuminate setae; movable finger with 1 long subdistal seta; rallum of 4 thickened blades, all blades serrate; lamina exterior present; galea long and slender.

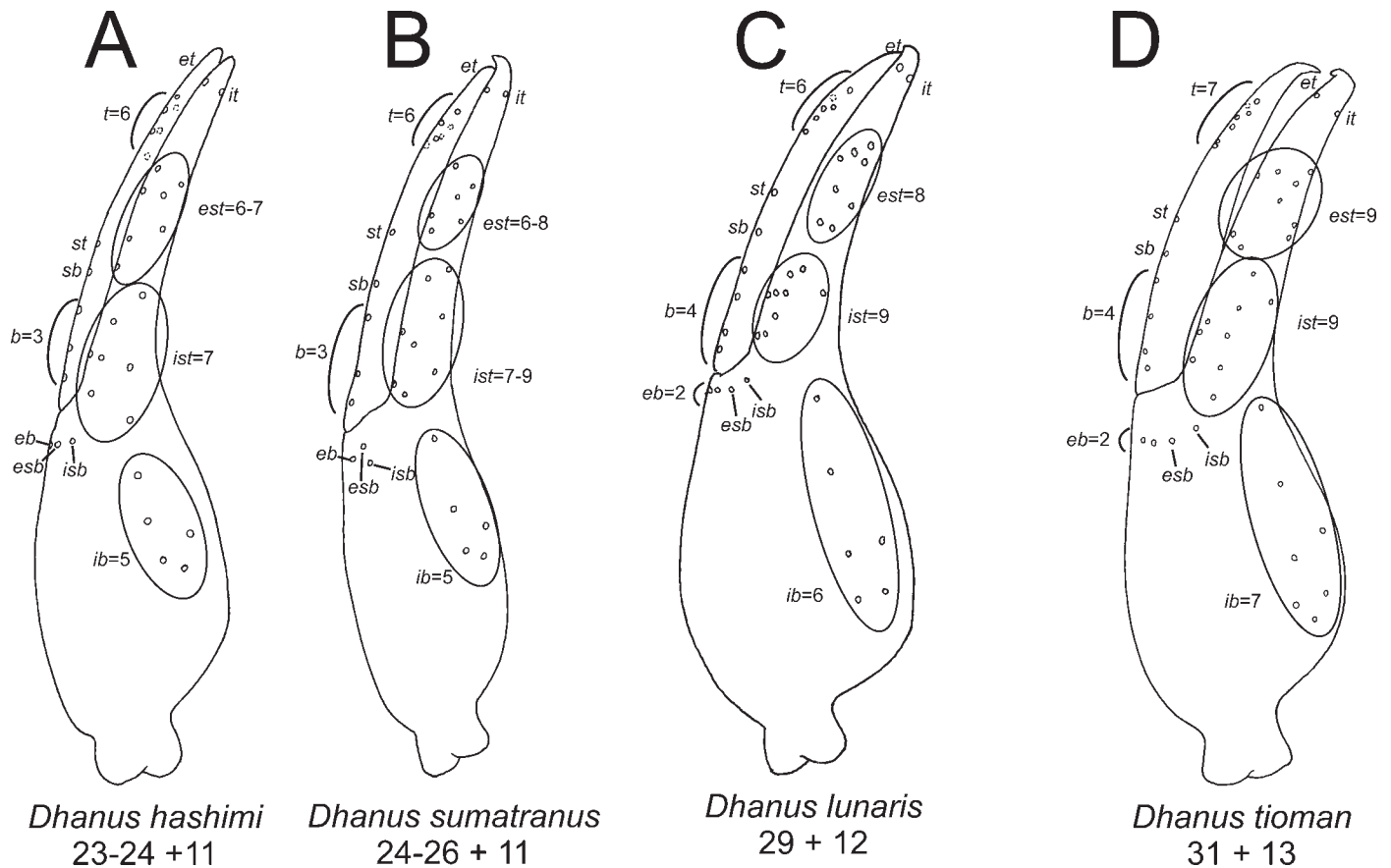


Figure 3.—Trichobothrial patterns of *Dhanus* species, taken from left chela (or a mirror image of the right chela), arranged in order of increasing trichobothrial number.

Pedipalp: long and slender; patella with disto-prolateral excavation. Fixed chelal finger with 23–28 trichobothria, movable chelal finger with 11–14 trichobothria (e.g., Fig. 3); *eb* region with 1–2 trichobothria; *est* region with 6–9 trichobothria; *ib* region with 5–6 trichobothria; *ist* region with 7 trichobothria; *b* region with 3–4 trichobothria; and *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger (Figs. 6D, 7D, 8C, 9C). Chelal teeth juxtadentate; base of fixed chelal finger without small denticles; chelal hand with retrolateral condyle small and rounded.

Carapace (Figs. 6A, 7A, 8A, 9A): with 2 small, bulging eyes; epistome present; with shallow posterior furrow.

Coxal region (Fig. 4A): manducatory process with 2 long distal setae; median maxillary lyrifissure present and sub-basally situated.

Legs (Figs. 7F, G, 8H, I): femur I and II without basal swelling; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; subterminal tarsal setae bifurcate; arolium undivided and shorter than claws or about same length as claws, without ventral hooked process (Figs. 6H, 7H, 8J); claws slender and simple.

Abdomen: tergites and sternites usually with indication of medial division, consisting of an anterior and posterior desclerotisation of the sclerite. Pleural membrane longitudi-

nally striate (Fig. 4C). Each stigmatic sclerite with 1 seta; spiracles simple, with spiracular helix. Anal operculum not abutting sternite X (Fig. 4B).

Genitalia: male median genital sac deeply bipartite (Fig. 4E); female with large gonosac covered with pores (Fig. 4G).

Description (tritonymph).—*Pedipalp*: fixed finger and hand with 16–23 trichobothria, movable finger with 9–12 trichobothria (Figs. 6F, 8E, 9D); *esb*, *it* and *et* regions each with 1 trichobothrium; *eb* region with 1–2 trichobothria; *ib* region with 3–5 trichobothria; *ist* region with 4–6 trichobothria; *est* region with 4–7 trichobothria; *et* slightly distal to *it*; *b* region with 3–4 trichobothria; *st* region with 1 trichobothrium; *t* region with 5–7 trichobothria; *isb* and *sb* absent.

Description (deutonymph).—*Pedipalp*: fixed finger and hand with 10 trichobothria, movable finger with 7 trichobothria (Figs. 6G, 9E); *eb*, *ist*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 2 trichobothria; *est* region with 3 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *t* region with 4 trichobothria; *esb*, *isb*, *sb* and *st* absent.

Description (protonymph).—Unknown.

Remarks.—Chamberlin (1930) included two Asian species when proposing the genus *Dhanus*: the type species *D. sumatranus* and *D. siamensis*. The third Asian ideoroncid described at the time, *Ideobisium laminatus*, was placed in a separate genus, *Shravana*. Chamberlin (1930) relied on the length of the arolium to separate *Dhanus* and *Shravana*, with *Dhanus* having a short arolium and *Shravana* having a long

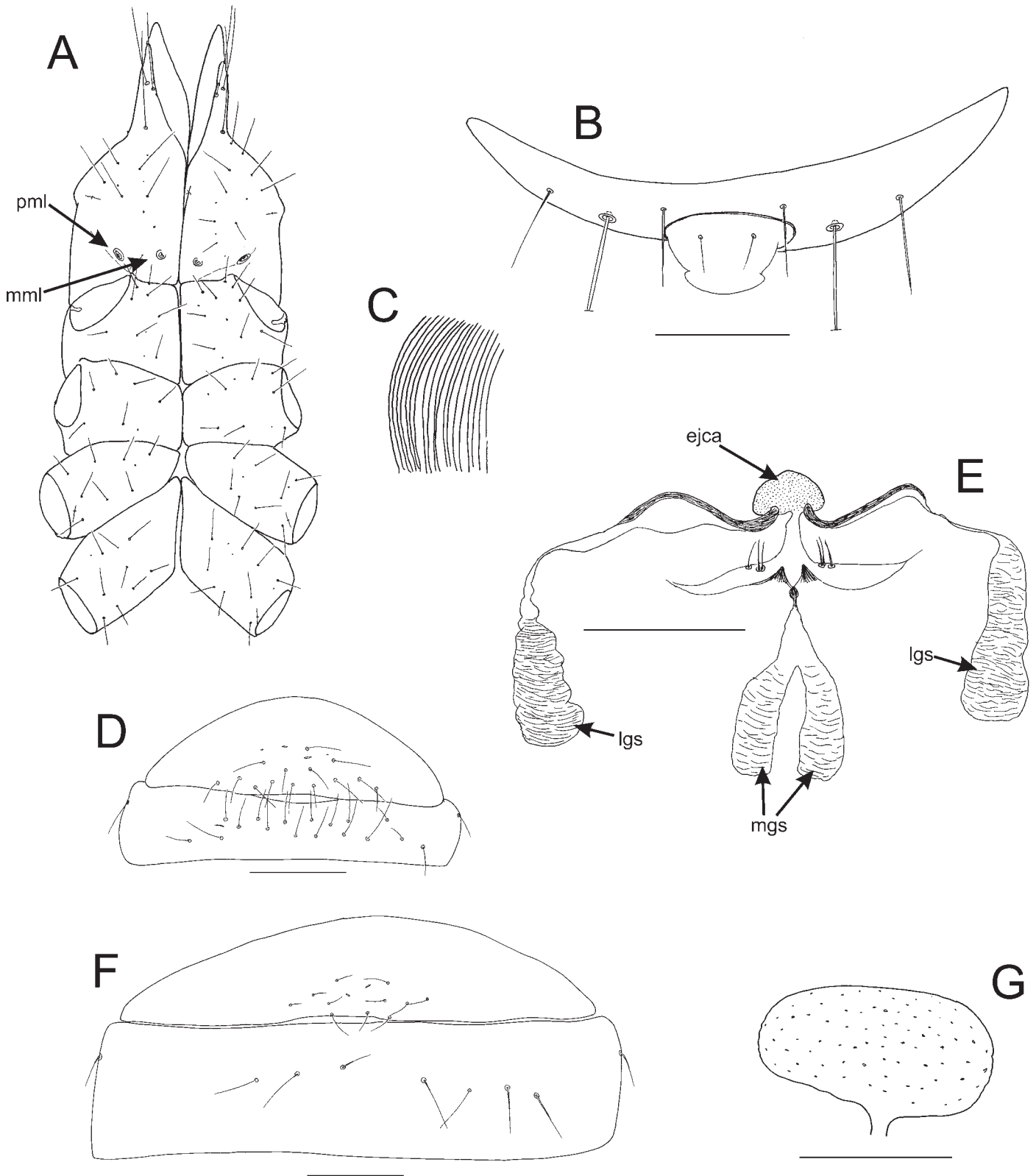


Figure 4.—*Dhanus sumatranus* (Redikorzev) from Gua Pandan, Batu Caves, Malaysia (WAM T135077): A. Cephalothorax, ventral, male; B. Sternite XI and anal operculum; C. Pleural membrane; D. Sternites III and IV, male, ventral; E. Male genitalia, ventral; F. Sternites III and IV, female, ventral; G. Female genitalia, ventral. Abbreviations: ejca, ejaculatory canal atrium; lgs, lateral genital sac; mgs, median genital sac; mml, median maxillary lyrifissure; pml, posterior maxillary lyrifissure. Scale lines = 0.2 mm (B, D–G).

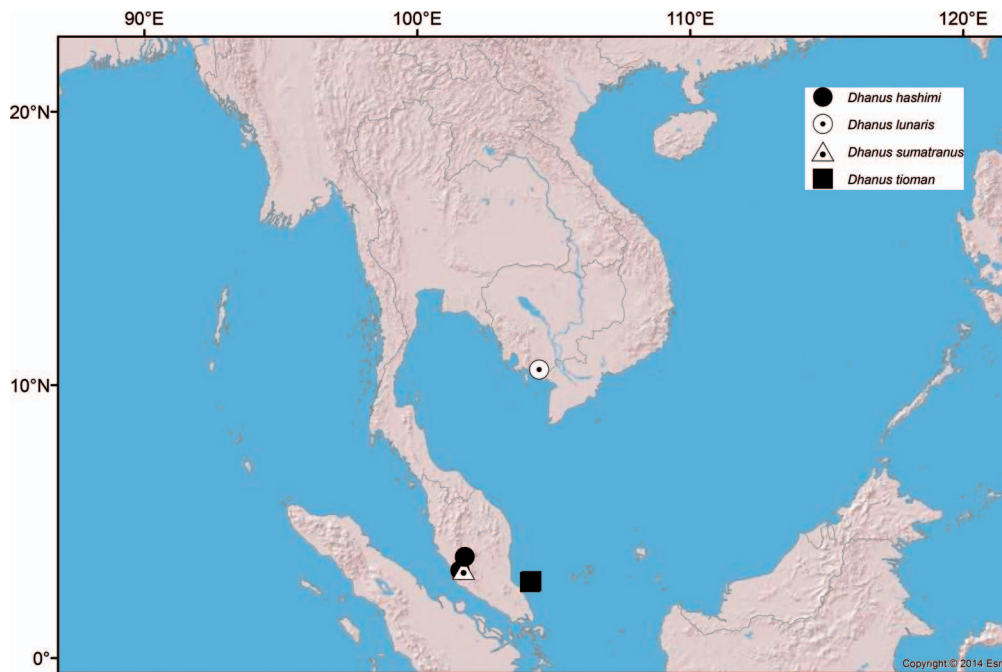


Figure 5.—Distribution of *Dhanus* species.

arolium. Examination of a wide range of ideoroncids from across the Asian region demonstrates that this feature is sufficiently constant to maintain both genera, with *Dhanus* restricted to *D. sumatranus* and three new species from Malaysia and Cambodia. As demonstrated elsewhere in this paper, *D. siamensis* lacks the cheliceral lamina interior found in all species of *Dhanus* and *Shravana*, and has a ventral hook on the arolium. Therefore, *D. siamensis* is transferred to a new genus, *Sironcus*.

Members of the genus *Dhanus* are found in peninsular Malaysia and southern Cambodia (Fig. 5). *Dhanus sumatranus* and *D. lunaris* are apparently restricted to cave ecosystems, but *D. hashimi* and *D. tioman* are found in tropical rainforest leaf litter.

Etymology.—The name *Dhanus* is most likely derived from Dhanus (or Dhanushya) which is a divine weapon in Hindu mythology.

KEY TO SPECIES OF *DHANUS*

1. Trichobothrium *ib* region extending only half-way along chelal hand (Fig. 8B, C); chelal hand with small patch of microsetae near *eb* and *esb* (Figs. 6D, 8C); fixed chelal finger and hand with 23–26 trichobothria (Fig. 3A, B); *eb* region with 1 trichobothrium (Fig. 3A, B); *b* region with 3 trichobothria (Fig. 3A, B)..... 2
- Trichobothrium *ib* region extending nearly full length of chelal hand (Figs. 7B, 9B); chelal hand without microsetae near *eb* and *esb* (Figs. 7D, 9C); fixed chelal finger and hand with 29–31 trichobothria (Fig. 3C,D); *eb* region with 2 trichobothria (Fig. 3A, B); *b* region with 4 trichobothria (Fig. 3A, B)..... 3
2. Trichobothria *eb*, *esb* and *isb* arranged in straight line (Fig. 6D); pedipalps larger and thinner [e.g., 1.46–1.53 (♂), 1.59–1.71 (♀) mm, 3.81–3.87 (♂), 3.57–3.61 (♀) x longer than broad]..... *D. hashimi*
- Trichobothrium *esb* situated in advance of *eb* and *isb*, forming triangle (Fig. 8C); pedipalps larger and thinner [e.g., chela (with pedicel) 2.275–2.55 (♂), 2.37–2.59 (♀) mm, 4.35–4.85 (♂), 4.09–4.14 (♀) x longer than broad].... *D. sumatranus*
3. Fixed chelal finger and hand with 29 trichobothria, including 6 in the *ib* region (Fig. 3C); movable finger with 12 trichobothria, including 6 in *t* region (Fig. 3C); chela (with pedicel) 2.11 (♀) mm in length..... *D. lunaris*
- Fixed chelal finger and hand with 31 trichobothria, including 7 in the *ib* region (Fig. 3D); movable finger with 13 trichobothria, including 7 in *t* region (Fig. 3D); chela (with pedicel) 1.34–1.495 (♂), 1.475–1.64 (♀) mm in length..... *D. tioman*

Dhanus hashimi sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:C83CEB48-DA1B-4E60-BAD7-8BF0DB32BA32>
(Figs. 3A, 6)

Material examined.—*Holotype male*. MALAYSIA: Pahang: Jalan Lady Maxwell, 3°42'59"N, 101°44'19"E, 1281 m, 22

June 2009, sifting rainforest litter, M.S. Harvey, K.L. Edward, R. Hashim, S. Dzarawi (ZMUM, WAM T129592).

Paratypes. MALAYSIA: Pahang: 2 ♀, Bukit Fraser, Air Tejun Jeriau (Jeriau Waterfall), 3°43'34"N, 101°42'49"E, 938 m, 21 June 2009, sifting dry litter, M.S. Harvey, K.L. Edward, R. Hashim, S. Dzarawi (WAM T125646, T129593); 1 ♂, Bukit Fraser [3°43'N, 101°45'E], 4,200 feet, 17 September 1972, T. Jaccoud (MHNG); 3 ♂, 2 ♀, 1 deutonymph, Fraser's Hill [=

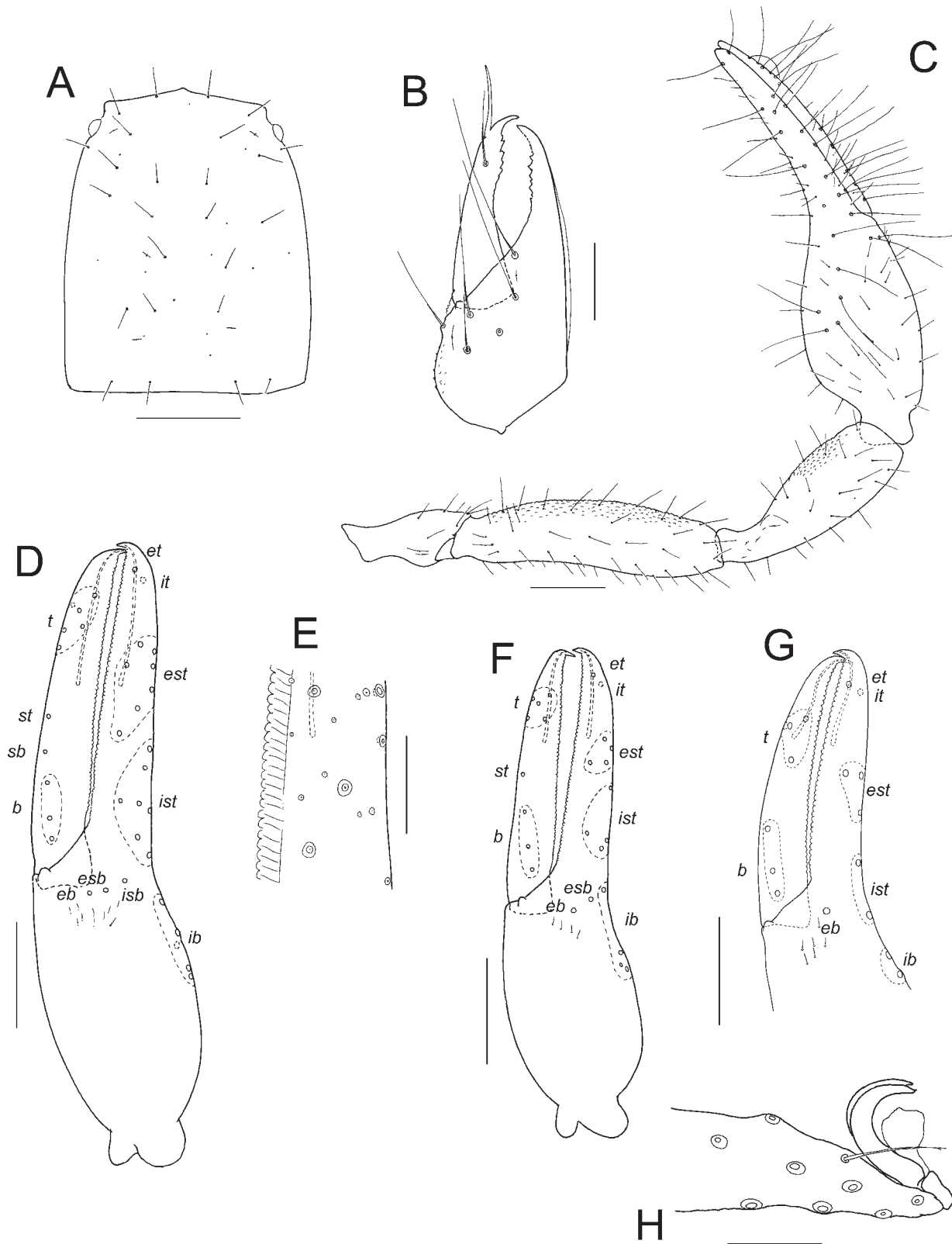


Figure 6.—*Dhanus hashimi* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Chelicera; C. Right pedipalp, dorsal; D. Left chela, lateral; E. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph (MHNG, from Bukit Fraser); F. Left chela, lateral, deutonymph (SMNS, from Bukit Fraser); G. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A, C, D, F); 0.2 mm (G); 0.1 mm (B, E); 0.05 mm (H).

Bukit Fraser] [3°43'N, 101°45'E], 17 April 1990, A. Riedel (SMNS); 1 ♂, 1 ♀, 1 tritonymph, Bukit Fraser, Maxwell Trail, 3°42'59.1"N, 101°44'18.9"E, 1350 m, evergreen hill forest, 12–16 May 2004, P. Schwendinger (MHNG); *Selangor*: 1 ♂, 2 ♀, The Gap [3°42'N, 101°44'E], 900 m, 14 March 1993, forêt dégradée (tamisage), I. Löbl, F. Calame (MHNG); 2 ♂, 1 ♀, 1 tritonymph, 1 km au-dessous de Fraser's Hill [3°42'N, 101°44'E], 1280 m, forêt dégradée (tamisage), 15 March 1993, I. Löbl, F. Calame (MHNG); 1 ♀, Sungei Buloh, near Kuala Lumpur [3°13'N, 101°34'E], 27 July 1972, T. Jaccoud (MHNG).

Diagnosis.—*Dhanus hashimi* is most similar to *D. sumatranus* as both have the trichobothria of the *ib* region restricted to the distal half of the chelal hand (Fig. 6C), several microsetae on the chelal hand near trichobothria *eb* and *esb* (Fig. 6D), and 23–26 trichobothria on the fixed chelal finger and hand (Fig. 3A). *Dhanus hashimi* differs from *D. sumatranus* by the smaller and stouter chelal and leg segments [e.g., chela (with pedicel) 1.46–1.53 (♂), 1.59–1.71 (♀) mm, 3.81–3.87 (♂), 3.57–3.61 (♀) x longer than broad in *D. hashimi*, and 2.275–2.55 (♂), 2.37–2.59 (♀) mm, 4.35–4.85 (♂), 4.09–4.14 (♀) x longer than broad in *D. sumatranus*], and by trichobothria *eb*, *esb* and *isb*, which are in a straight line in *D. hashimi* (Fig. 6D) but are arranged in a triangle in *D. sumatranus* (Fig. 6C).

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera (Fig. 6B): with 7–9 setae on hand; movable finger with 1 submedial seta; galea very slender and elongate; fixed finger with 9–11 (♂), 11–12 (♀) teeth; movable finger with 6 (♂), 6–7 (♀) teeth; rallum of 4 blades, each with 1–3 small serrations; lamina exterior present, very thin.

Pedipalp (Fig. 6C): prolateral faces of femur and patella coarsely rugose, trochanter and chela smooth; trochanter 2.03–2.39 (♂), 2.18–2.38 (♀), femur 3.70–4.14 (♂), 3.52–3.75 (♀), patella 2.76–3.19 (♂), 2.73–2.88 (♀), chela (with pedicel) 3.81–3.87 (♂), 3.53–3.61 (♀), chela (without pedicel) 3.61–3.68 (♂), 3.33–3.44 (♀), hand 1.59–1.66 (♂), 1.48–1.53 (♀) x longer than broad, movable finger 1.25–1.35 (♂), 1.28–1.33 (♀) x longer than hand. Fixed chelal finger with 23–24 trichobothria, movable chelal finger with 11 trichobothria (Figs. 3A, 6D): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 5 trichobothria, and extending about half-way along chelal hand; *ist* region with 7 trichobothria; *est* region with 6–7 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; 10 small, lanceolate setae situated proximal to *eb-esb-isb*. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 6D). Chelal hand with patch of microsetae basal to *eb* and *esb* (Fig. 6D). Chelal teeth flat topped, slightly retrorse, evenly spaced (Fig. 6E), fixed finger with 67 (♂), 69 (♀) teeth; movable finger with 63 (♂), 62 (♀) teeth.

Carapace (Fig. 6A): 1.17–1.23 (♂), 1.03–1.16 (♀) x longer than broad; lateral margins evenly convex; with 2 small bulging eyes; with small epistome; with 25 (♂), 28 (♀) setae,

including 4 near anterior margin and 4 near posterior margin; with shallow posterior furrow.

Coxal region: manducatory process with 2 long apical setae, plus 10 (♂), 8 (♀) additional setae; chaetotaxy of coxae I–IV: ♂, 5: 8: 8: 9; ♀, 5: 6: 8: 7.

Legs: femur + patella 2.88–3.04 (♂), 2.92–3.13 (♀) x longer than deep; subterminal tarsal setae weakly bifurcate (Fig. 6H); arolium slightly shorter than claws (Fig. 6H).

Abdomen: tergites and sternites barely divided and uniseriate. Tergal chaetotaxy: ♂, 6: 7: 9: 11: 13: 14: 12: 13: 12: 11: 10 (including 4 tactile setae); 2; ♀, 4: 7: 9: 12: 12: 12: 12: 11: 12: 11: 8 (including 4 tactile setae); 2. Sternal chaetotaxy: ♂, 12: (1) 12 [3+3] (1): (1) 9 (1): 15: 14: 14: 14: 13: 12: 7 (including 4 tactile setae); 2; ♀, 6: (1) 5 (1): (1) 9 (1): 12: 13: 13: 13: 14: 13: 8 (including 4 tactile setae); 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: holotype followed by other males (when measured): Body length 2.02 (2.06–2.69). *Pedipalp*: trochanter 0.415/0.175 (0.375–0.43/0.175–0.20), femur 0.88/0.225 (0.85–0.91/0.22–0.23), patella 0.725/0.235 (0.69–0.765/0.235–0.26), chela (with pedicel) 1.465/0.375 (1.46–1.53/0.38–0.40), chela (without pedicel) 1.38 (1.38–1.47), hand length 0.63 (0.62–0.64), movable finger length 0.815 (0.785–0.86). Chelicera 0.395/0.17, movable finger length 0.255. Carapace 0.75/0.615 (0.74–0.80/0.63–0.665); eye diameter 0.055. Leg I: femur 0.46/0.10, patella 0.22/0.11, tibia 0.315/0.085, metatarsus 0.19/0.07, tarsus 0.31/0.065. Leg IV: femur + patella 0.69/0.24 (0.685–0.695/0.225–0.235), tibia 0.515/0.11, metatarsus 0.25/0.09, tarsus 0.44/0.075.

Females: paratype (WAM T125646) followed by other females (when measured): Body length 2.69 (2.00–3.09). *Pedipalp*: trochanter 0.44/0.185 (0.435–0.465/0.195–0.20), femur 0.915/0.24 (0.90–0.95/0.24–0.27), patella 0.79/0.265 (0.75–0.805/0.275–0.28), chela (with pedicel) 1.60/0.435 (1.59–1.71/0.44–0.485), chela (without pedicel) 1.505 (1.515–1.615), hand length 0.67 (0.675–0.72), movable finger length 0.835 (0.895–0.92). Chelicera 0.435/0.195, movable finger length 0.28. Carapace 0.755/0.705 (0.77–0.91/0.665–0.775); eye diameter 0.06. Leg I: femur 0.46/0.105, patella 0.215/0.115, tibia 0.31/0.08, metatarsus 0.175/0.07, tarsus 0.315/0.065. Leg IV: femur + patella 0.715/0.235 (0.72–0.745/0.23–0.255), tibia 0.515/0.11, metatarsus 0.255/0.095, tarsus 0.40/0.095.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 7 setae on hand; 1 on movable finger; fixed finger with 8 small teeth, movable finger with 4 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.34, femur 3.41, patella 2.60, chela (with pedicel) 3.63, chela (without pedicel) 3.42, hand 1.43 x longer than broad; movable finger 1.35 x longer than hand (without pedicel). Fixed chelal finger with 16 trichobothria, movable chelal finger with 9 trichobothria (Fig. 6F); *isb* and *st* absent; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *est* region with 4 trichobothria; *ib* region with 4 trichobothria; *ist* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 20 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 1.97. *Pedipalp:* trochanter 0.34/0.145, femur 0.665/0.195, patella 0.56/0.215, chela (with pedicel) 1.18/0.325, chela (without pedicel) 1.11, hand length 0.465, movable finger length 0.63. Carapace 0.605/0.51.

Description (deutonymph).—*Chelicera:* galea long and slender, slightly curved; with 5 setae on hand; 1 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.29, femur 3.59, patella 2.19, chela (with pedicel) 3.55, chela (without pedicel) 3.39, hand 1.60 x longer than broad; movable finger 1.44 x longer than hand (without pedicel). Fixed chelal finger with 10 trichobothria, movable chelal finger with 7 trichobothria (Fig. 6G); *esb*, *isb*, *sb* and *st* absent; *eb*, *et* and *it* regions each with 1 trichobothrium; *eb* at base of finger; *est* region with 3 trichobothria; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *t* region with 4 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 1.52. *Pedipalp:* trochanter 0.275/0.12, femur 0.52/0.145, patella 0.35/0.16, chela (with pedicel) 0.905/0.255, chela (without pedicel) 0.865, hand length 0.36, movable finger length 0.52. Carapace 0.52/0.425.

Remarks.—This species is known from south-western Malaysia in the states of Pahang and Selangor (Fig. 5). The specimens were collected from leaf litter.

Etymology.—This species is named for Professor Dr Rosli Hashim, University of Malaya, in recognition of his support for the field work conducted in Malaysia which resulted in the collection of specimens of this species.

Dhanus lunaris sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:6072C16A-EB43-4366-AA75-01E8DE02AC11>

(Figs. 3C, 7)

Material examined.—*Holotype female.* CAMBODIA: *Kampot:* Grotte de Kampong Trach [10°34'N, 104°28'E], sur les parois, relativement sèches, November 1967, Cl. Boutin (MNHN Ps-KH5).

Diagnosis.—*Dhanus lunaris* is most similar to *D. tioman* as both have the trichobothria of the chelal hand extending for most of the length of the hand (Figs. 7B, 9B) and they both lack microsetae on the chelal hand near trichobothria *eb* and *esb* (Figs. 7D, 9C). *Dhanus lunaris* has only 29 trichobothria on the fixed chelal finger and hand, including 6 in the *ib* region (Fig. 3C), whereas *D. tioman* has 31 trichobothria, with 7 in the *ib* region (Fig. 3D). *Dhanus lunaris* is larger than *D. tioman* and has thinner pedipalpal segments, e.g., chela (with pedicel) length 2.11 (♀) mm and 3.20 (♀) x longer than broad.

Description (adult).—*Color:* pedipalps and carapace red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera (Fig. 7C): with 7 setae on hand; movable finger with 1 submedial seta; galea very slender and elongate; fixed finger with 8 teeth; movable finger with 7 teeth; rallum of 4

blades, distal 3 with several small serrations, basal blade broken, not observed; lamina exterior present, very thin.

Pedipalp (Fig. 7B): prolateral faces of femur and patella coarsely rugose, prolateral face of chela slightly rugose, trochanter smooth; trochanter 1.98, femur 4.15, patella 3.35, chela (with pedicel) 3.20, chela (without pedicel) 3.03, hand 0.79 x longer than broad, movable finger 2.06 x longer than hand. Fixed chelal finger with 29 trichobothria, movable chelal finger with 12 trichobothria (Figs. 3C, 7D): *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 2 trichobothria; *ib* region with 6 trichobothria, and extending nearly full length of chelal hand; *ist* region with 9 trichobothria; *est* region with 8 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 7D). Chelal hand without microsetae near *eb* and *esb* (Fig. 7D). Chelal teeth slightly retrorse, pointed distally, becoming rounded basally, evenly spaced (Fig. 7E), fixed finger with ca. 80 teeth; movable finger with 69 teeth.

Carapace (Fig. 7A): 1.31 x longer than broad; lateral margins evenly convex; with 2 small bulging eyes; without epistome; with ca. 36 setae, including 4 near anterior margin and 6 near posterior margin; with shallow posterior furrow.

Coxal region: manducatory process with 2 long apical setae, plus 9 other setae; chaetotaxy of coxae I–IV: 6: 8: 8: 8.

Legs (Fig. 7F, G): femur + patella 2.85 x longer than deep; subterminal tarsal setae bifurcate (Fig. 7H); arolium slightly shorter than claws (Fig. 7H).

Abdomen: tergites and sternites apparently undivided, uniseriate. Tergal chaetotaxy: 6: 7: 8: 10: 12: 11: 12: 11: 12: 8: 8: 2. Sternal chaetotaxy: 4: (1) 4 (1): (1) 7 (1): 10: 12: 12: 11: 10: 10: 10: 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: with large gonosac covered with scattered pores.

Dimensions (mm), female: holotype: Body length 3.92. *Pedipalp:* trochanter 0.532/0.269, femur 1.31/0.316, patella 1.200/0.358, chela (with pedicel) 2.112, chela (without pedicel) 1.998, hand length 0.520, movable finger length 1.069. *Chelicera* 0.538/0.230, movable finger length 0.365. Carapace 1.091/0.832; eye diameter 0.052. Leg I: femur 0.624/0.158, patella 0.324/0.146, tibia 0.558/0.096, metatarsus 0.286/0.082, tarsus 0.418/0.058. Leg IV: femur + patella 1.008/0.354, tibia 0.778/0.149, metatarsus 0.352/0.130, tarsus 0.576/0.081.

Remarks.—*Dhanus lunaris* is known from a humid cave in southern Cambodia (Fig. 5). The holotype is slightly depigmented, and displays some troglomorphic adaptations such as large body size and slightly elongated legs.

Etymology.—This species is named for the local, unofficial name of the cave, which translates as Moon Cave (*lunar*, Latin, of the moon) (Brown 1956).

Dhanus sumatranus (Redikorzev, 1922)

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:2268091F-6C5A-431A-A590-70484F30CD0E>

(Figs. 1, 3B, 4, 8)

Ideoroncus sumatranus Redikorzev 1922:545–550, figs. 1–4.

Dhanus sumatranus (Redikorzev): Chamberlin 1930:47, figs.

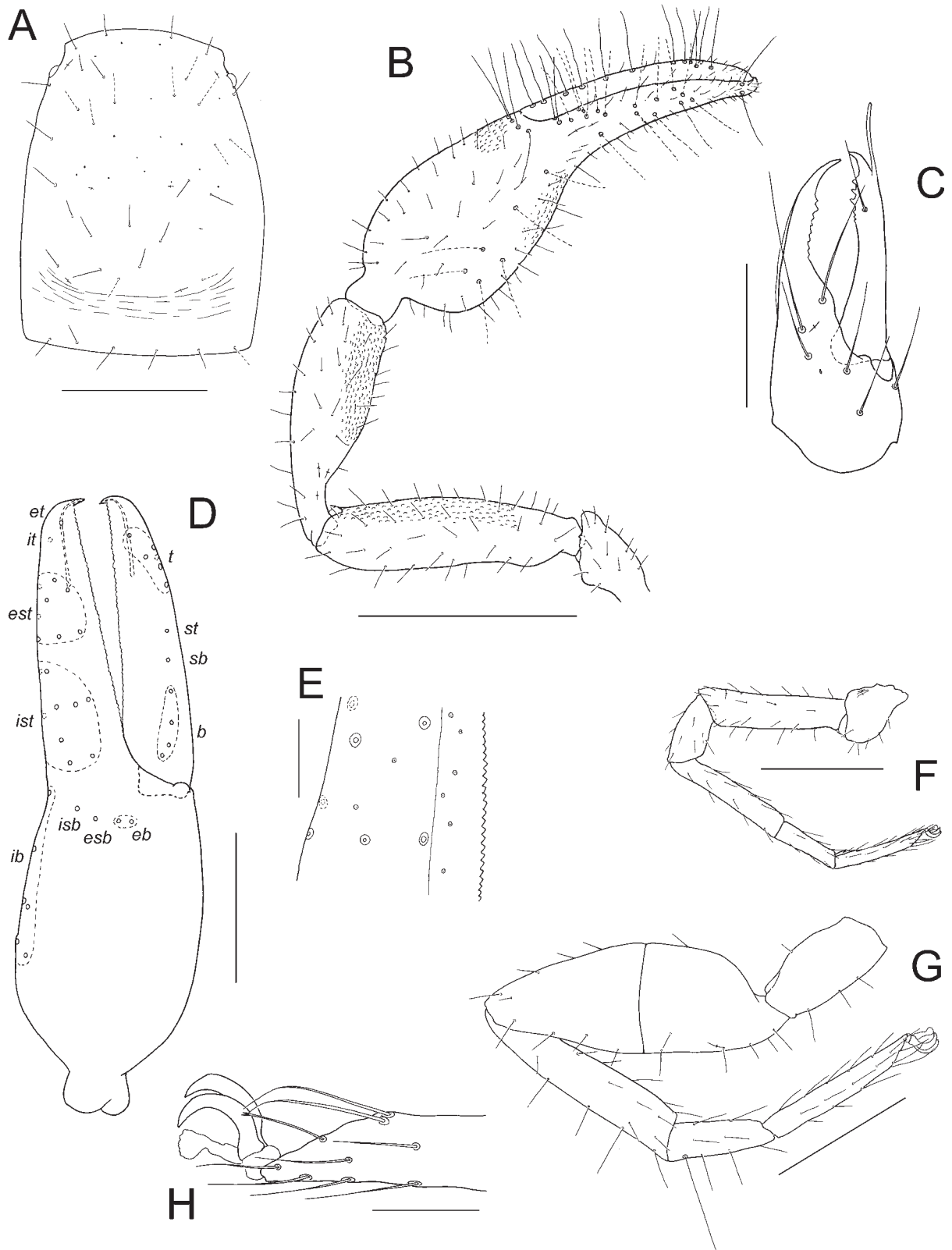


Figure 7.—*Dhanus lunaris* sp. nov., female holotype: A. Carapace; B. Left pedipalp, dorsal; C. Right chelicera; D. Right chela, lateral; E. Detail of fixed chelal finger; F. Left leg I; G. Left leg IV; H. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 1.0 mm (B); 0.5 mm (A, D, F, G); 0.25 mm (C); 0.1 mm (E, H).

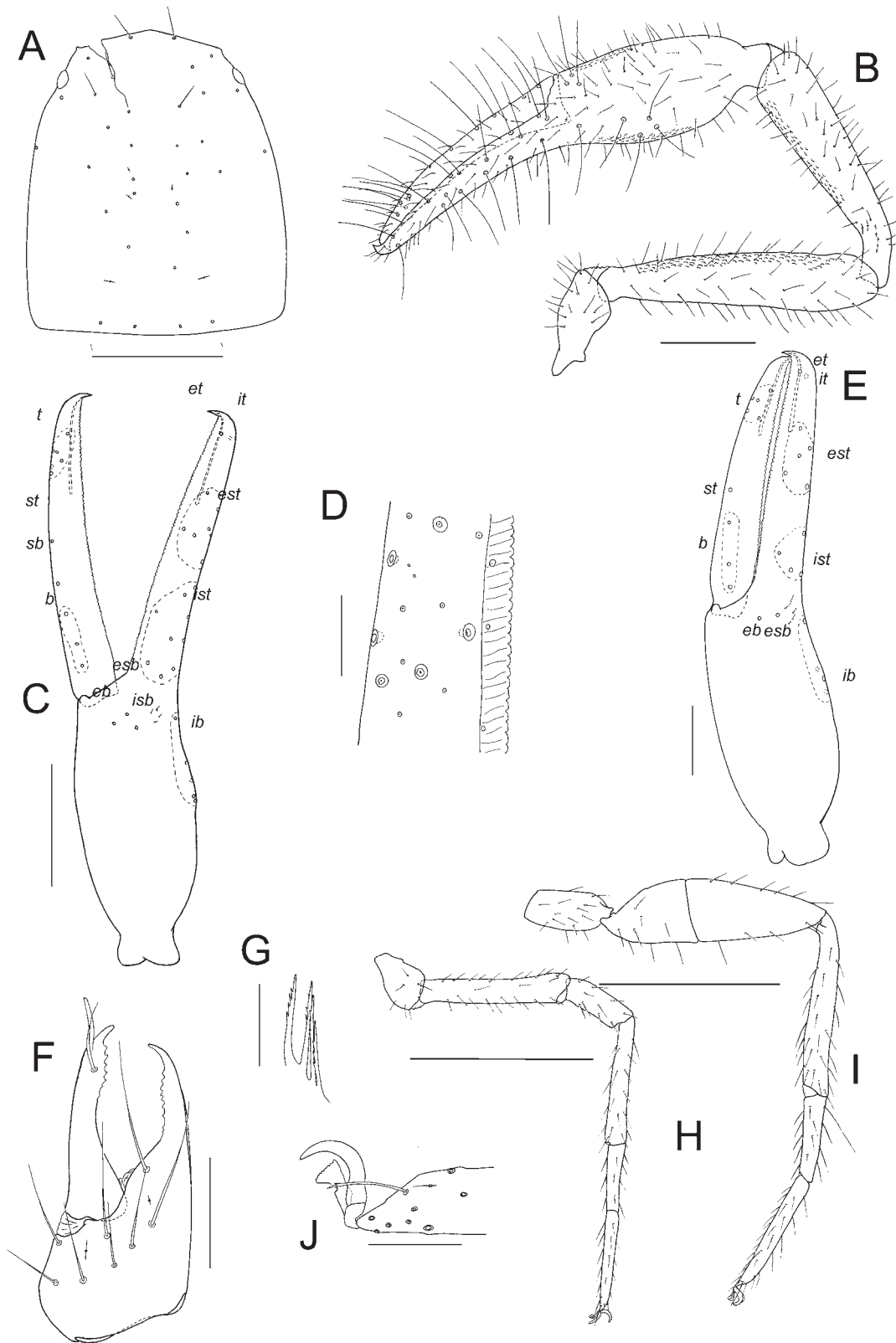


Figure 8.—*Dhanus sumatranus* (Redikorzev), male from Batu Cave, Malaysia (CAS, JC-103.01001), unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Right chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph (WAM T135077); F. Left chelicera, female (CAS, JC-103.01003); G. Rallum, female (CAS, JC-103.01003); H. Leg I (male, CAS, JC-103.01002); I. Leg IV (male, CAS, JC-103.01002). J. Distal end of leg IV, showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 1.0 mm (H, I); 0.5 mm (A–C); 0.25 mm (E); 0.2 mm (F, J).

2ff, 3c; Chamberlin 1931:128, figs. 13n–p, 15j, 25i, 25m–n; Beier 1932a:174–175, fig. 203; Roewer 1936: fig. 30d; Roewer 1937: 257; Beier 1963:51; McClure 1965:71; McClure, Lim & Winn 1967:425; Harvey 1991:319; Harvey, Barba, Muchmore & Pérez 2007: fig. 6; Harvey & Volschenk 2007:368, figs. 1–4; Mosely, Lim & Lim 2012:89; Harvey 2013: unpaginated.

Dhanus doveri Bristowe 1952:699–700, figs. 3–5; McClure 1965:71; McClure, Lim & Winn 1967:425; Harvey 1991:318; Judson 1997:15; Mosely, Lim & Lim 2012:89; Harvey 2013: unpaginated. **Syn. nov.** [<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:7B200418-D767-43FD-BAB8-676399679524>]
Dhanus sp.: Yussuf 1988:figure on p. 29; Yussuf 1997:plate 28.

Material examined.—*Syntype female*. MALAYSIA: *Selangor*: Batu Caves (as “Datu Caves”) [3°14'N, 101°42'E], lover (=lower?) cave, dark (=Dark Cave), 25 January 1913, O. John (ZISP, no. 187).

Other material. MALAYSIA: *Selangor*: 2 ♂, 1 ♀, Batu Caves [3°14'N, 101°42'E], “dark places” and “permanent dark”, E. Mjöberg (CAS, JC–103.01001–3); 10 ♂, 18 ♀, 1 tritonymph, Gua Pandan, Batu Caves, 3°14'28"N, 101°41'14"E, 19 January 2015, dark zone, under rocks and on cave wall, M.S. Harvey, T.W. Lim, Z.K. Hymeir, M.F. Azmi, J. Nordin, L.T. Tshen (ZMUM, WAM T135069–135077).

Diagnosis.—*Dhanus sumatranus* is most similar to *D. hashimi* as both have the trichobothria of the *ib* region restricted to the distal half of the chelal hand (Figs. 6C, 8B), several microsetae on the chelal hand near trichobothria *eb* and *esb* (Figs. 6D, 8C), and 23–26 trichobothria on the fixed chelal finger and hand (Fig. 3A, B). *Dhanus sumatranus* differs from *D. hashimi* by the larger and thinner pedipalpal and leg segments [e.g., chela (with pedicel) 2.275–2.55 (♂), 2.37–2.59 (♀) mm, 4.35–4.85 (♂), 4.09–4.14 (♀) x longer than broad in *D. sumatranus*, and 1.46–1.53 (♂), 1.59–1.71 (♀) mm, 3.81–3.87 (♂), 3.57–3.61 (♀) x longer than broad in *D. hashimi*], and by trichobothria *eb*, *esb* and *isb*, which are arranged in a triangle in *D. sumatranus* (Fig. 8C), but are in a straight line in *D. hashimi*.

Description (adult).—*Color* (Fig. 1): pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera (Fig. 8F): with 6–8 (♂), 7–8 (♀) long, acuminate setae on hand; movable finger with 1 long subdistal seta; galea very slender and elongate, longer in the female; cheliceral teeth all small and of equal size, fixed finger with 9 (♂), 9 (♀) teeth, movable finger with 6 (♂), 9 (♀) teeth; rallum (Fig. 8G) of 4 thickened serrate blades; lamina exterior present.

Pedipalp (Fig. 8B): trochanter slightly scaly, femur and patella rugose, prolateral and retrolateral faces of chela rugose; trochanter 2.08–2.30 (♂), 2.00–2.31 (♀), femur 5.13–5.23 (♂), 4.86–5.01 (♀), patella 4.19–4.50 (♂), 3.74–4.16 (♀), chela (with pedicel) 4.35–4.85 (♂), 4.09–4.14 (♀), chela (without pedicel) 4.13–4.58 (♂), 3.88–3.98 (♀), hand 1.87–2.13 (♂), 1.81–2.26 (♀) x longer than broad, movable finger 1.20–1.33 (♂), 1.19–1.29 (♀) x longer than hand. Fixed chelal

finger with 23–26 trichobothria, movable chelal finger with 11 trichobothria (Figs. 3B, 8C): *eb*, *esb* and *isb* forming a triangle at base of finger, with *isb* situated posterior to *esb*; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 5 trichobothria, and extending about half-way along chelal hand; *ist* region with 7–9 trichobothria; *est* region with 6–8 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and midway between *t* region and *st* in movable finger. Chelal hand with small patch of microsetae near *eb* and *esb* (Fig. 8C). Chelal teeth all closely spaced, rounded (Fig. 8D), fixed finger with 79 (♂), 80 (♀) teeth; movable finger with 75 (♂), 72 (♀) teeth.

Carapace (Fig. 8A): 1.16–1.31 (♂), 1.08–1.32 (♀) x longer than broad; lateral margins slightly convex; with 2 small, bulging eyes; small epistome present; with 32 (♂), 34 (♀) setae, including 4 near anterior margin and 4 near posterior margin; with shallow posterior furrow.

Coxal region (Fig. 4A): manducatory process with 2 long apical setae, plus 12 (♂), 10 (♀) additional setae; chaetotaxy of coxae I–IV: ♂, 10: 8: 8: 9; ♀, 7: 6: 7: 9.

Legs (Fig. 8H, I): femur + patella 3.66–4.11 (♂), 3.95–4.68 (♀) x longer than deep; subterminal tarsal setae with 2 small sub-distal denticles (Fig. 8J); arolium undivided and somewhat shorter than claws (Fig. 8J).

Abdomen: tergites and sternites undivided and uniseriate, all setae acuminate; tergal chaetotaxy: ♂, 5: 6: 10: 11: 11: 11: 11: 12: 8 (including 4 tactile setae); 6 (including 4 tactile setae); 2; ♀, 5: 6: 7: 10: 12: 12: 11: 12: 12: 8 (including 4 tactile setae); 7 (including 4 tactile setae); 2; sternal chaetotaxy: ♂, 15: (1) 21 (1): (1) 8 [3 + 3] (1): 14: 13: 12: 12: 11: 10: 6 (including 2 tactile setae); 2; ♀, 11: (1) 10 (1): (1) 9 (1): 12: 13: 12: 12: 12: 11: 6 (including 2 tactile setae): 2.

Genitalia: male with median genital sac deeply bipartite (Fig. 4E); female with large gonosac covered with pores (Fig. 4G).

Dimensions (mm): Males: WAM T135077A followed by other males (when measured): Body length 3.62 (3.70). *Pedipalp*: trochanter 0.53/0.255 (0.58–0.62/0.26–0.27), femur 1.49/0.285 (1.48–1.54/0.285–0.30), patella 1.35/0.30 (1.34–1.41/0.32), chela (with pedicel) 2.255/0.465 (2.275–2.35/0.505–0.54), chela (without pedicel) 2.13 (2.15–2.23), hand length 0.99 (0.945–1.025), movable finger length 1.19 (1.255–1.31). Chelicera 0.48/0.205, movable finger length 0.31. Carapace 1.105/0.845 (1.15–1.155/1.00); eye diameter 0.075. Leg I: femur 0.78/0.135, patella 0.365/0.13, tibia 0.655/0.085, metatarsus 0.345/0.085, tarsus 0.51/0.075. Leg IV: femur + patella 1.15/0.28 (1.19–1.245/0.325–0.335), tibia 0.955/0.125, metatarsus 0.445/0.11, tarsus 0.655/0.09.

Females: WAM T135077F followed by other females (when measured): Body length 3.99 (4.38). *Pedipalp*: trochanter 0.625/0.27 (0.54–0.61/0.265–0.27), femur 1.56/0.315 (1.435–1.46/0.29–0.30), patella 1.435/0.345 (1.31–1.345/0.335–1.35), chela (with pedicel) 2.59/0.625 (2.37–2.42/0.58), chela (without pedicel) 2.43 (2.25–2.315), hand length 1.145 (1.05), movable finger length 1.36 (1.31–1.355). Chelicera 0.56/0.24, movable finger length 0.37. Carapace 1.215/0.92 (1.135–1.165/0.785–1.08); eye diameter 0.075. Leg I: femur 0.865/0.145, patella

0.405/0.14, tibia 0.73/0.115, metatarsus 0.385/0.09, tarsus 0.575/0.075. Leg IV: femur + patella 1.31/0.28 (1.245–1.31/0.27–0.315), tibia 1.05/0.14, metatarsus 0.51/0.115, tarsus 0.75/0.09.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with 7 small teeth, movable finger with 6 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.38, femur 4.50, patella 3.76, chela (with pedicel) 4.20, chela (without pedicel) 3.99, hand 1.85 x longer than broad; movable finger 1.20 x longer than hand (without pedicel). Fixed chelal finger with 17 trichobothria, movable chelal finger with 9 trichobothria (Fig. 8E); *isb* and *sb* absent; *eb* and *esb* at base of finger; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 4 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: anterior margin medially prominent; with 2 small, bulging eyes; with 26 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm) (WAM T135077U): Body length 2.43. *Pedipalp*: trochanter 0.475/0.20, femur 1.125/0.25, patella 1.015/0.27, chela (with pedicel) 1.825/0.435, chela (without pedicel) 1.735, hand length 0.805, movable finger length 0.97. Carapace 0.915/0.66.

Remarks.—Redikorzev (1922) described *Ideoroncus sumatranus* from two adult specimens (one male and one female), neither of which was apparently selected as the holotype. Only the female has been available for this study, which is in fair condition although the right chelicera and both first legs have been dissected from the specimen and are no longer included in the vial with the specimen. The type locality of *I. sumatranus* has been unclear. Redikorzev (1922) stated that the specimens were collected from “Sumatra, Datu Caves, lover cave, dark” in 1913 by O. John. The word “lover” appears to be a typographical error for “lower”. Beier (1932b) recorded the locality as “Sumatra: Datu (Batu) Höhlen”, and he later altered the type locality of *I. sumatranus* to Batu Caves, near Kuala Lumpur, in Malaysia (Beier 1963). Harvey (1991) tentatively implied that the type locality may be situated in Malaysia. The specimens, however, were definitely from Dark Cave, Batu Caves, Malaysia, and not from Sumatra, as outlined in an article by O. John, the collector of the specimens (John 1914), who even mentioned the collection of pseudoscorpions (p. 363). Therefore, the type locality of *I. sumatranus* is here amended to Dark Cave.

The three slide-mounted specimens recorded as *D. sumatranus* by Chamberlin (1930) are labelled “Batu Caves, peninsular Malaysia” but were reported by Chamberlin (1930) to be from Batu Caves, “Northern Sarawak”; the latter location was confirmed by E. Mjöberg in correspondence with Chamberlin (1930, p. 48). The female type specimen of *I. sumatranus* and the three Mjöberg specimens appear to represent the same species. The meristics of most segments are very similar and, most importantly, all four specimens display the unusual arrangement of trichobothria *eb*, *esb* and *isb* where *esb* is situated slightly in advance of the other two thus forming a triangular arrangement (Fig. 8C). In

the other three species of *Dhanus* examined for this study, these three trichobothria are situated in a straight line (Figs. 6D, 7D, 9C). The recently collected specimens from Gua Pandan, a cave in the Batu Caves hill, are also conspecific with the type specimen and Mjöberg’s specimens. Due to the morphological congruence, it is very likely that Mjöberg’s specimens indeed came from Batu Caves, Kuala Lumpur, rather than from a cave in northern Sarawak. Mjöberg spent several years in south-east Asia, first at the Deli Experimental Station in Sumatra from 1919–1921, and then as curator of the Sarawak State Museum in Borneo 1922–1924. In an account of his experiences published in “Forest life and adventures in the Malay Archipelago” Mjöberg (1930), he does not mention the Batu Caves, but it is conceivable that he did indeed visit this iconic location during his time in Asia. He did indeed visit the Niah Caves in northern Sarawak (Mjöberg 1930), which is perhaps the source of any confusion that might have occurred.

Dhanus doveri was described from an unknown number of specimens collected in Dark Cave by W.S. Bristowe in 1930 and 1931 (Bristowe 1952). These specimens are not present in the BMNH (Judson 1997), and do not appear to have been among Bristowe’s personal collection after his death in 1979 (A. Russell-Smith, in litt., 8 July 2013). The original description of *D. doveri* lacks sufficient detail to adequately characterize the species.

A search by the author in Dark Cave in May 2009 failed to locate any specimens of *Dhanus*, but a large population was subsequently found in the dark zone of Gua Pandan in January 2015. As this cave is also situated in the Batu massif, and is only 600 m from Dark Cave (Lim et al. 2010), there is little doubt that these specimens are conspecific with *D. sumatranus*. In particular, they share the triangular arrangement of *eb*, *esb* and *isb*. As *I. sumatranus* and *D. doveri* share the same type locality, I have no hesitation in placing *D. doveri* as a junior synonym of *D. sumatranus*. It is unfortunate that the name of this species, which thus far is known only from the Batu Caves, must be retained as “*sumatranus*”. Article 18 of the International Commission on Zoological Nomenclature (1999) states that the original name must be retained, even if the name is inappropriate.

Some of the specimens collected in Gua Pandan were found under rocks, but most were found on the walls of the cave, particularly where the bat guano on the floor of the cave meets the wall. The pseudoscorpions were very abundant, and two were observed to feed on small cockroaches (Fig. 1B), most likely of the cave cockroach *Pycnoscelus striata* (Kirby, 1903) (T.W. Lim, in litt., 24 January 2015).

There is slight variation in the number and positions of the trichobothria of the fixed chelal finger. For example, the three adult specimens collected by Mjöberg have a total of 24–26 trichobothria; one male (JC–103.010001) has 7 trichobothria in the *est* region and 9 in the *ist* region on the left finger and has 6 trichobothria in the *est* region and 8 in the *ist* region on the right finger; the second male (JC–103.010002) has 7 trichobothria in the *est* region and 8 in the *ist* region on the left finger, with the right chela absent from the slide preparation; and the female (JC–103.010003) has 6 trichobothria in the *est* region and 9 in the *ist* region on the left finger, and 8 trichobothria in the *est* region and 7 in the *ist* region on the left finger.

Dhanus tioman sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:59FF9BFF-D58A-4261-8A44-0D45BA84BFBF>
(Figs. 3D, 9)

Material examined.—*Holotype male*. MALAYSIA: *Pahang*: Tioman Island, westside of Mount Kajang, 2 km E. of Kg. Genting, 2°47'N, 104°08'E, 24 June 2001, 100 m, M01–41, A. Schulz, K. Vock (MHNG).

Paratypes. MALAYSIA: *Pahang*: 1 ♀, 1 tritonymph, collected with holotype (MHNG); 1 ♂, Tioman Island, westside of Mount Kajang, 2 km E. of Kg. Genting, 2°47'N, 104°08'E, 2 July 2001, 400 m, M01–108, A. Schulz & K. Vock (MHNG); 1 ♀, Tioman Island, westside of Mount Kajang, 2 km E. of Kg. Genting, 2°47'N, 104°08'E, 24 June 2001, 100 m, M01–8, A. Schulz, K. Vock (MHNG); 1 ♀, same data except 25 June 2001, M01–36 (MHNG); 1 ♂, 1 ♀, same data except M01–37 (WAM T140743); 2 ♀, same data except 26 June 2001, M01–39 (MHNG); 2 ♂, 1 tritonymph, same data except M01–67 (MHNG); 1 ♂, 2 ♀, same data except M01–40 (MHNG); 3 ♂, 1 ♀, same data except M01–69 (MHNG); 2 ♂, 2 ♀, 1 tritonymph, 1 deutonymph, same data except 27 June 2001, M01–68 (MHNG); 2 ♂, 1 ♀, same data except 28 June 2001, M01–72 (MHNG); 1 ♀, Tioman Island, westside, 2 km E. of Kg. Tekek, 2°49'N, 104°11'E, 4 July 2001, 500 m, M01–142, A. Schulz, K. Vock (MHNG).

Diagnosis.—*Dhanus tioman* is most similar to *D. lunaris* as both have the trichobothria of the chelal hand extending for most of the length of the hand (Figs. 7D, 9B) and they both lack microsetae on the chelal hand near trichobothria *eb* and *esb* (Figs. 7D, 9B). *Dhanus tioman* has 31 trichobothria on the fixed chelal finger and hand, including 6 in the *ib* region (Fig. 3D), whereas *D. lunaris* has only 29 trichobothria, including 5 in the *ib* region (Fig. 3C). *Dhanus tioman* is smaller than *D. lunaris* and has stouter pedipalpal segments, e.g., chela (with pedicel) length 1.34–1.495 (♂), 1.475–1.64 (♀) mm and 3.29–3.36 (♂), 3.04–3.27 (♀) x longer than broad.

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

Chelicera: with 7–8 (♂, ♀) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 7 (♂), 7 (♀) teeth; movable finger with 5 (♂), 6 (♀) teeth; rallum of 4 serrate blades; very slender lamina exterior present.

Pedipalp (Fig. 9B): prolateral faces of trochanter finely granulate, prolateral face of femur and patella and both prolateral and retrolateral faces of chela coarsely rugose; trochanter 2.34–2.46 (♂), 2.26–2.45 (♀), femur 3.27–3.52 (♂), 3.20–3.46 (♀), patella 2.44–2.54 (♂), 2.34–2.63 (♀), chela (with pedicel) 3.28–3.36 (♂), 3.04–3.27 (♀), chela (without pedicel) 3.00–3.13 (♂), 2.80–3.03 (♀), hand 1.32–1.56 (♂), 1.44–1.52 (♀) x longer than broad, movable finger 1.05–1.07 (♂), 0.95–1.12 (♀) x longer than hand. Fixed chelal finger with 31 trichobothria, movable chelal finger with 13 trichobothria (Figs. 3D, 9C): *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 2 trichobothria; *ib* region with 7 trichobothria; *ist* region with 9 trichobothria; *est* region with 9 trichobothria; *et* slightly

distal to *it*; *b* region with 4 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 7 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 9C). Chelal hand without microsetae near *eb* and *esb* (Fig. 9C). Chelal teeth very low, small and rounded, fixed finger with 73 (♂), 76 (♀) teeth; movable finger with 61 (♂), 64 (♀) teeth.

Carapace (Fig. 9A): 1.06–1.18 (♂), 0.94–1.16 (♀) x longer than broad; lateral margins slightly convex; with 2 small bulging eyes; without epistome; with 40 (♂), 35 (♀) setae, including 4 (♂, ♀) setae near anterior margin and 10 (♂, ♀) near posterior margin; with shallow posterior furrow.

Coxal region: manducatory process with 2 long apical setae, plus 11 (♂, ♀) other setae; chaetotaxy of coxae I–IV: ♂, 9: 8: 9: 11; ♀, 7: 8: 9: 10.

Legs: femur + patella 2.80 (♂), 2.88 (♀) x longer than deep; subterminal tarsal setae with 2–3 distal furcae (Fig. 9F); arolium slightly shorter than claws (Fig. 9F).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 11: 10: 10: 10: 13: 14: 13: 14: 14: 10 (including 4 tactile setae): 10 (including 4 tactile setae): 2; ♀, 12: 10: 11: 11: 12: 12: 12: 11: 12: 9 (including 2 tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 10: (1) 11 [3+3] (1): (1) 9 (1): 16: 14: 15: 15: 15: 11: 12 (including 4 tactile setae): 2; ♀, 8: (1) 8 (1): (1) 8 (1): 15: 15: 15: 16: 13: 13: 10 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: holotype followed by other males (when measured): Body length 2.76 (2.13–2.50). *Pedipalp*: trochanter 0.445/0.19 (0.43–0.45/0.175–0.19), femur 0.865/0.26 (0.80–0.88/0.235–0.25), patella 0.72/0.30 (0.67–0.75/0.275–0.295), chela (with pedicel) 1.495/0.455 (1.34–1.46/0.41–0.435), chela (without pedicel) 1.39 (1.27–1.36), hand length 0.675 (0.605–0.67), movable finger length 0.778 (0.68–0.725). Chelicera 0.415/0.20, movable finger length 0.28. Carapace 0.76/0.72 (0.69–0.735/0.59–0.64); eye diameter 0.035. Leg I: femur 0.425/0.125, patella 0.215/0.13, tibia 0.365/0.095, metatarsus 0.18/0.07, tarsus 0.325/0.06. Leg IV: femur + patella 0.685/0.245, tibia 0.52/0.125, metatarsus 0.43/0.095, tarsus 0.41/0.065.

Females: paratype (MHNG M01–08) followed by other females (when measured): Body length 3.38 (2.23–3.10). *Pedipalp*: trochanter 0.485/0.21 (0.43–0.49/0.19–0.205), femur 0.99/0.29 (0.80–0.95/0.25–0.275), patella 0.84/0.345 (0.70–0.815/0.28–0.33), chela (with pedicel) 1.64/0.52 (1.395–1.615/0.44–0.52), chela (without pedicel) 1.52 (1.29–1.49), hand length 0.79 (0.635–0.77), movable finger length 0.785 (0.70–0.805). Chelicera 0.485/0.225, movable finger length 0.31. Carapace 0.805/0.86 (0.67–0.85/0.64–0.74); eye diameter 0.045. Leg I: femur 0.455/0.12, patella 0.235/0.125, tibia 0.385/0.095, metatarsus 0.19/0.07, tarsus 0.335/0.06. Leg IV: femur + patella 0.75/0.26, tibia 0.545/0.14, metatarsus 0.255/0.10, tarsus 0.44/0.07.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 7 setae on hand; 1 on movable finger; fixed finger with 8 small teeth, movable finger with 9 small teeth; rallum composed of 4 blades, all serrate.

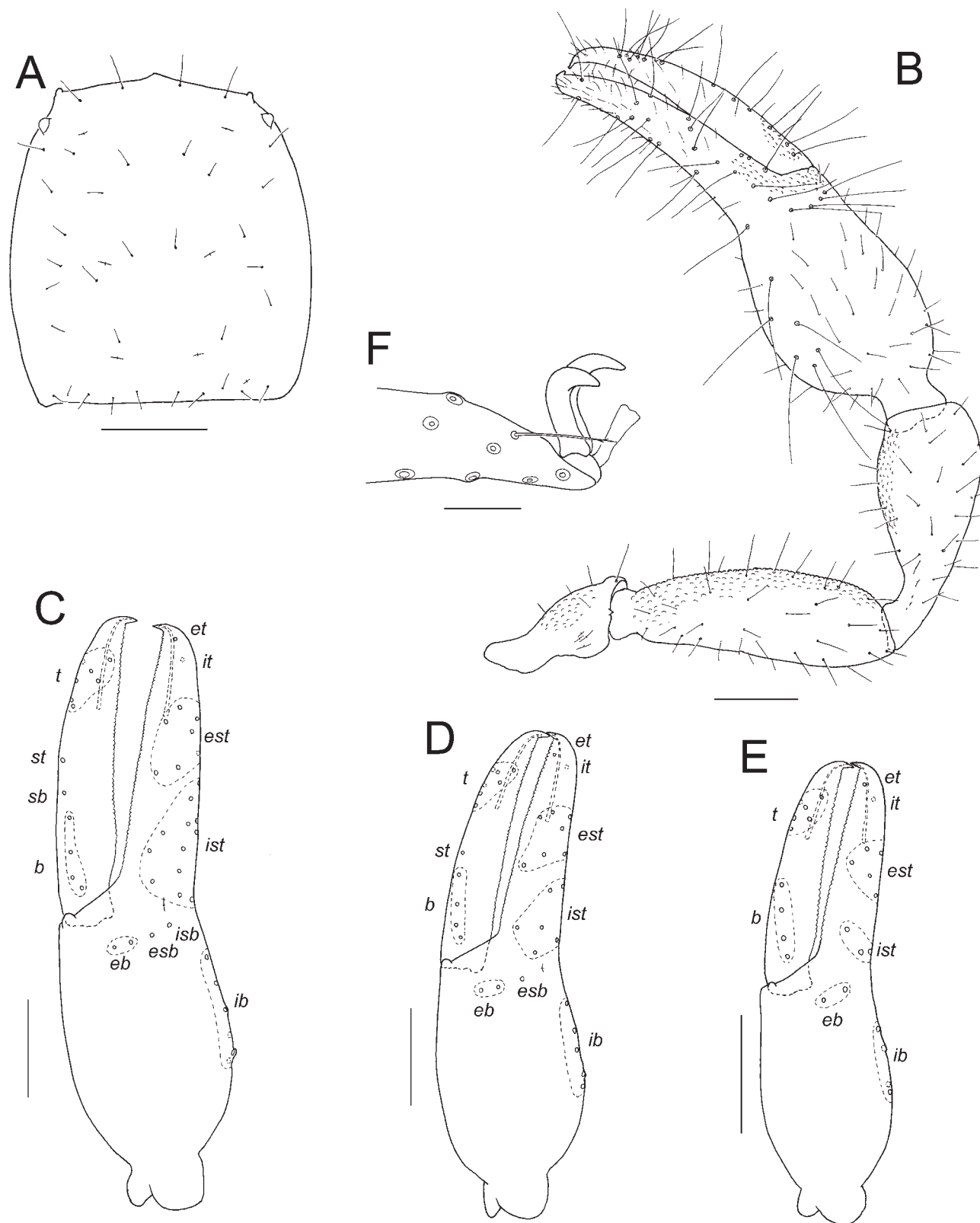


Figure 9.—*Dhanus tioman* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Left chela, lateral, tritonymph paratype; E. Left chela, lateral, deutonymph paratype; F. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A–E); 0.1 mm (F).

Pedipalp: trochanter 2.27, femur 3.21, patella 2.40, chela (with pedicel) 3.19, chela (without pedicel) 2.98, hand 1.49 x longer than broad; movable finger 1.06 x longer than hand (without pedicel). Fixed chelal finger with 23 trichobothria, movable chelal finger with 12 trichobothria (Fig. 9D); *isb* and *sb* absent; *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *eb* region with 2 trichobothria; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 7 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *st* region with 1 trichobothrium; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 33 setae including 4 setae near anterior margin and 9 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 2.56. *Pedipalp*: trochanter 0.384/0.169, femur 0.706/0.220, patella 0.621/0.259, chela (with pedicel) 1.25/0.392, chela (without pedicel) 1.170, hand length 0.583, movable finger length 0.618. Carapace 0.656/0.621.

Description (deutonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with 6 small teeth, movable finger with 4 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.36, femur 3.61, patella 2.26, chela (with pedicel) 3.20, chela (without pedicel) 3.07, hand 1.51 x longer than broad; movable finger 1.02 x longer than hand (without pedicel). Fixed chelal finger with 16 trichobothria, movable chelal finger with 10 trichobothria (Fig. 9D); *isb* and *sb* absent; *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *eb* region with 2 trichobothria; *ib* region with 4 trichobothria; *ist* region with 3 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 25 setae including 4 setae near anterior margin and 6 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 1.41. *Pedipalp*: trochanter 0.295/0.125, femur 0.56/0.155, patella 0.44/0.195, chela (with pedicel) 0.945/0.295, chela (without pedicel) 0.905, hand length 0.445, movable finger length 0.455. Carapace 0.44/0.385.

Remarks.—*Dhanus tioman* has only been collected from rainforest leaf litter habitats on Pulau Tioman (Fig. 5) in southern Malaysia, where it occurs sympatrically with *Shravana withi*.

Etymology.—The specific epithet is a noun in apposition taken from the type locality, Pulau Tioman.

Shravana Chamberlin, 1930

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:F041190B-270B-4B74-B0A1-DD3790C1CD78>

Shravana Chamberlin, 1930:48; Beier, 1932a:175–176; Mahnert, 1984:679; Harvey, 1991:322; Harvey, 2013: unpaginated.

Nhatrangia Redikorzev, 1938:78–79; Mahnert, 1984:680–681; Harvey, 1991:321; Harvey, 2013: unpaginated. First synonymized by Beier (1967). [<http://zoobank.org/>

NomenclaturalActs/urn:lsid:zoobank.org:act:6EA06891-2D6D-4342-A911-E422F11C73E5]

Type species.—*Shravana: Ideobisium (Ideoroncus) laminatus* With, 1906, by original designation. *Nhatrangia: Nhatrangia dawydoffi* Redikorzev, 1938, by monotypy.

Diagnosis.—Species of *Shravana* differ from all other genera except *Dhanus* and *Negroroncus* by the presence of a thin lamina exterior on the chelicera (Figs. 14D, 16B, 18B). They differ from *Dhanus* by the long arolium (e.g., Fig. 17E), and from *Negroroncus* by the lack of a ventral hooked process on the arolium (e.g., Fig. 17E).

Description (adult).—*Setae*: generally long, straight or slightly curved, and acicular.

Chelicera: hand with 6–8 (or occasionally 5) long, acuminate setae; movable finger with 1 long subdistal seta; rallum of 4 thickened blades, all blades serrate; lamina exterior present; galea long and slender.

Pedipalp: long and slender; patella with disto-prolateral excavation. Fixed chelal finger with 20–31 trichobothria, movable chelal finger with 10–14 trichobothria (Fig. 10); *esb*, *isb*, *et* and *it* regions each with 1 trichobothrium; *eb* region with 1–3 trichobothria; *est* region with 6–9 trichobothria; *ib* region with 4–6 trichobothria; *ist* region with 5–12 trichobothria; *b* region with 2–4 trichobothria; and *t* region with 6–8 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger. Chelal teeth juxtadentate; base of fixed chelal finger without small denticles; chelal hand with retrolateral condyle small and rounded; without patch of microsetae near *eb*, *esb* and *isb*.

Carapace (e.g., Fig. 17A): with 2 small, bulging eyes; epistome present; posterior furrow either absent or very shallow.

Coxal region (Fig. 17A): manducatory process with 2 long distal setae; median maxillary lyrifissure present and sub-basally situated.

Legs: femur I and II without basal swelling; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; subterminal tarsal setae distally bifurcate or trifurcate; arolium undivided and longer than claws, without ventral hooked process; claws slender and simple.

Abdomen: tergites and sternites usually with indication of medial division, consisting of an anterior and posterior desclerotisation of the sclerite. Pleural membrane longitudinally striate. Each stigmatic sclerite with 1 seta; spiracles simple, with spiracular helix. Anal operculum not abutting sternite X (Fig. 11B).

Genitalia: male with median genital sac deeply bipartite (Fig. 11E); female with large gonosac covered with pores (Fig. 11G).

Description (tritonymph).—*Pedipalp*: fixed finger and hand with 16–25 trichobothria, movable finger with 8–12 trichobothria (Figs. 13E, 18F, 19F, 20E, 21E); *esb*, *it* and *et* regions each with 1 trichobothrium; *eb* region with 1–3 trichobothria; *ib* region with 4 trichobothria; *ist* region with 3–7 trichobothria; *est* region with 5–8 trichobothria; *et* slightly distal to *it*; *b* region with 3–4 trichobothria; *st* region with 1 trichobothrium; *t* region with 5–7 trichobothria; *isb* and *sb* absent.

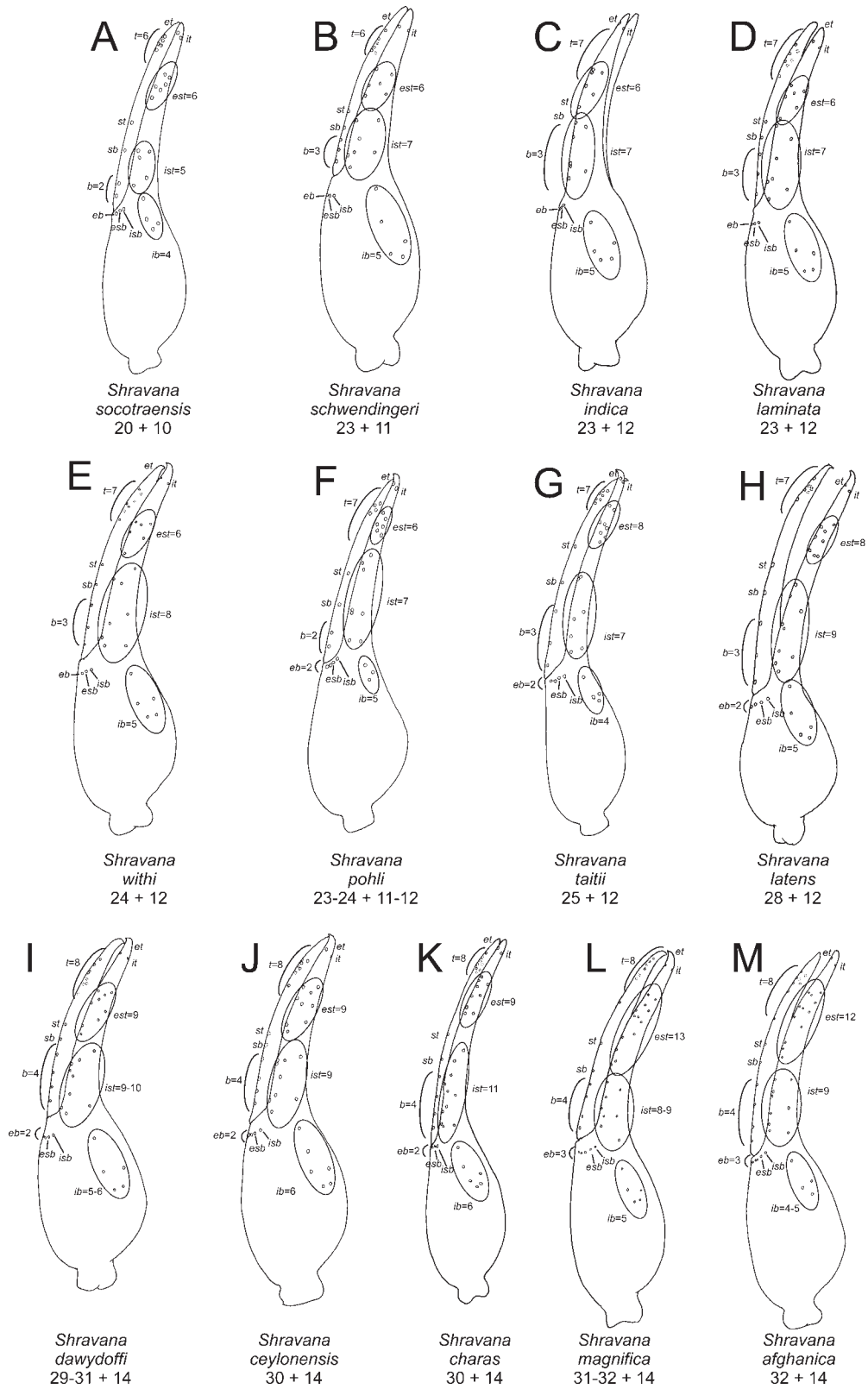


Figure 10.—Trichobothrial patterns of *Shrivana* species, taken from left chela (or a mirror image of the right chela), arranged in order of increasing trichobothrial number.

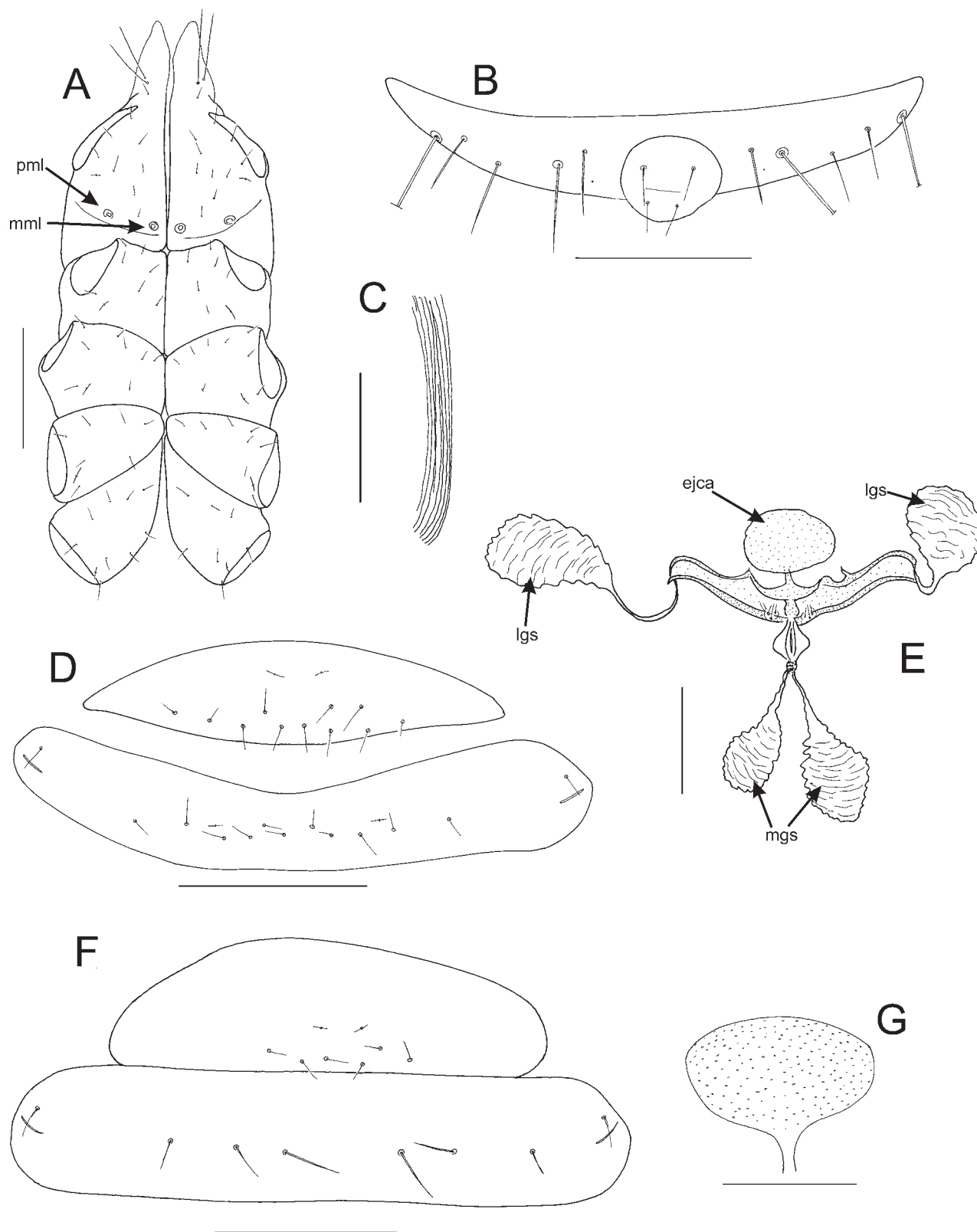


Figure 11.—*Shrivana laminata* (With), male and female from Ko Chang, Thailand (MNHG), unless stated otherwise: A. Cephalothorax, ventral, male; B. Sternite XI and anal operculum, female; C. Pleural membrane, male; D. Sternites III and IV, ventral, male; E. Male genitalia, ventral; F. Sternites III and IV, female, ventral; G. Female genitalia, ventral. Abbreviations: ejca, ejaculatory canal atrium; lgs, lateral genital sac; mgs, median genital sac; mml, median maxillary lyrifissure; pml, posterior maxillary lyrifissure. Scale lines = 0.25 mm (A); 0.2 mm (B, D, F, G); 0.1 mm (E); 0.05 mm (C).

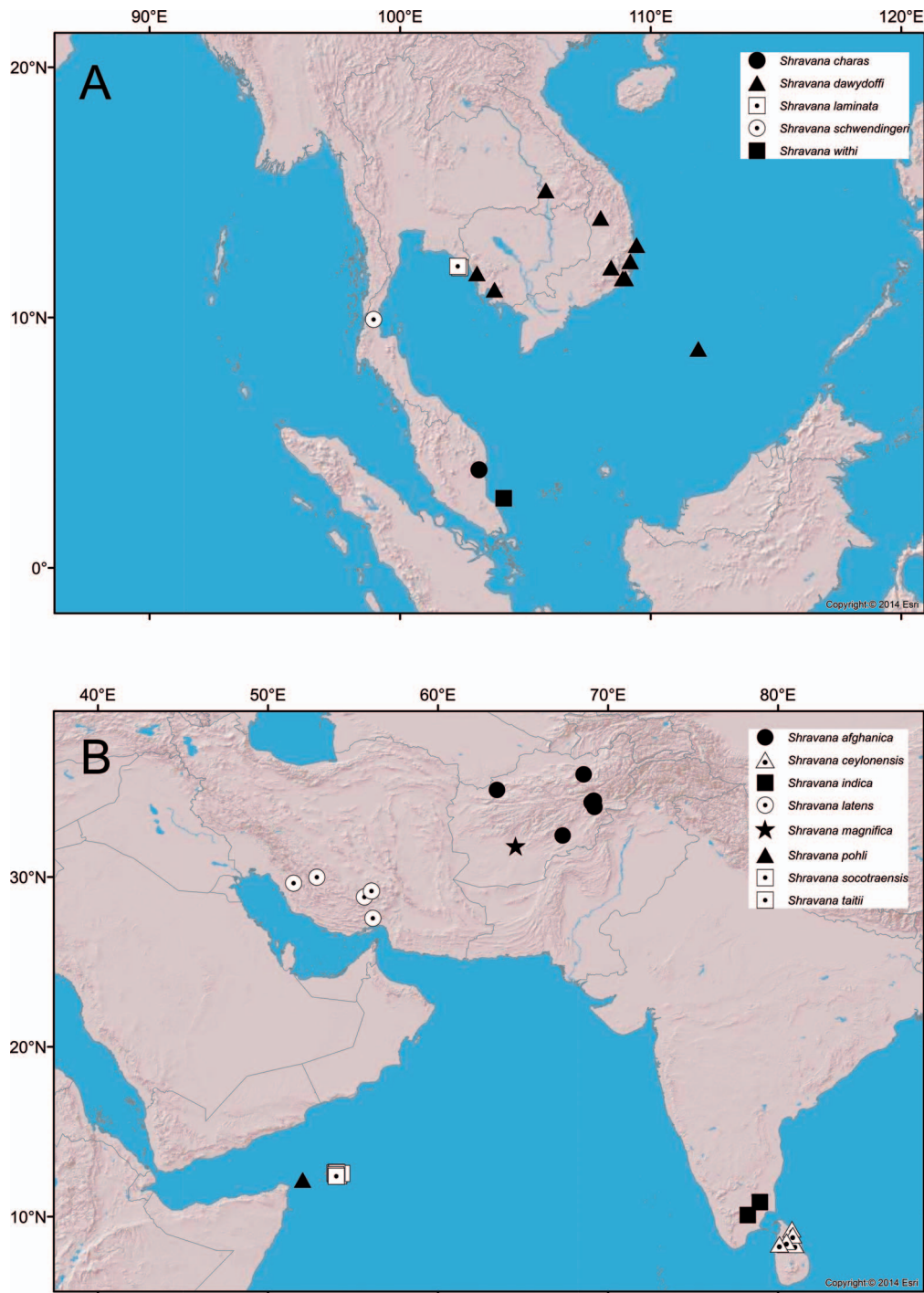


Figure 12.—Distribution of *Shravana* species.

Description (deutonymph).—*Pedipalp*: fixed finger and hand with 9–20 trichobothria, movable finger with 6–10 trichobothria (Figs. 13F, 14C, 19G, 20F); *it* and *et* regions each with 1 trichobothrium; *eb* region with 1–2 trichobothria; *ib* region with 2–4 trichobothria; *ist* region with 2–6 trichobothria; *est* region with 3–6 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *t* region with 6 trichobothria; *esb*, *isb*, *sb* and *st* absent.

Description (protonymph).—Unknown.

Remarks.—Mahnert (1984) separated *Nhatrangia* and *Shravana* based on the total number of trichobothria (30/14 and 31/14, including two in the *eb* group in *Nhatrangia*, and 23/12 including only one in the *eb* group in *Shravana*). With the discovery of species with patterns of 20/10, 23/12, 24/12, 25/12, 28/12, 30/14 and 31/14 trichobothria (Table 1), it suggests that basing generic concepts solely on trichobothrial number is fruitless. Therefore, the synonymy of *Nhatrangia* with *Shravana*, which was first proposed by Beier (1967), is

supported. The generic diagnosis proposed here entails the transfer to *Shravana* of several species that were previously included in *Dhanus*: *D. afghanicus*, *D. indicus*, *D. pohli*, *D. socotraensis* and *D. taitii*. All these species have a thin lamina exterior and long arolia that lack a ventral hook.

Members of the genus *Shravana* are found sporadically throughout Asia and the Socotran archipelago (Fig. 12), including Socotra (*S. pohli*, *S. taitii* and *S. socotraensis*), Iran (*S. latens*), Afghanistan (*S. afghanica* and *S. magnifica*), India (*S. indica*), Sri Lanka (*S. ceylonensis*), and south-eastern Asia (*S. charas*, *S. dawydoffi*, *S. laminata*, *S. schwendingeri* and *S. withi*).

Etymology.—The name *Shravana* is probably taken from the Hindu lunar mansion of the same name. The gender of the

name was not specified by Chamberlin (1930), but his alteration of the species name *Ideobisium* (*Ideoroncus*) *laminatus* to *Shravana laminata* suggests that he considered the name to be feminine.

Nhatrangia is derived from the Vietnamese town of Nha Trang, one of the original localities from which the type species was collected. The gender of the name was not specified by Redikorzev (1938), and the only included species, *N. dawydoffi*, is a patronym and cannot be used to determine gender. The only other species included in the genus, *N. ceylonensis*, is an adjective and likewise does not indicate the gender of the genus.

KEY TO SPECIES OF *SHRAVANA*

1. Trichobothrium *b* region with 2 or 3 trichobothria (Fig. 10A–H) 2
Trichobothrium *b* region with 4 trichobothria (Fig. 10I–M) 9
2. Trichobothrium *b* region with 2 trichobothria (Fig. 10A, F) 3
Trichobothrium *b* region with 3 trichobothria (Fig. 10C–E, G, H) 4
3. Chela with 20 trichobothria on fixed finger and hand, and 10 trichobothria on movable finger (Fig. 10A) ... *S. socotraensis*
Chela with 23–24 trichobothria on fixed finger and hand, and 11–12 trichobothria on movable finger (Fig. 10F)
..... *S. pohli*
4. Trichobothrium *eb* region with 1 trichobothrium (Fig. 10B–E) 5
Trichobothrium *eb* region with 2 trichobothria (Fig. 10G, H) 8
5. Pedipalpal femur and patella rugose (Figs. 16B, 20B, 21B) 6
All palpal segments completely smooth (Fig. 17B) *S. laminata*
6. Prolateral face of chelal hand rugose (Fig. 16B) *S. indica*
Prolateral face of chelal hand smooth (Figs. 20B, 21B) 7
7. Chela with 24 trichobothria on fixed finger and hand, including *ist* region with 8 trichobothria (Fig. 10E); *ib* region situated in distal half of chelal hand (Fig. 10E); movable finger with 12 trichobothria, including *t* region with 7 trichobothria (Fig. 10E) *S. withi*
Chela with 23 trichobothria on fixed finger and hand, including *ist* region with 6 trichobothria (Fig. 10B); *ib* region situated in middle of chelal hand (Fig. 10B); movable finger with 11 trichobothria, including *t* region with 6 trichobothria (Fig. 10B) *S. schwendingeri*
8. Chela with 25 trichobothria on fixed finger and hand, including *ist* region with 7 trichobothria (Fig. 10G) *S. taitii*
Chela with 28 trichobothria on fixed finger and hand, including *ist* region with 9 trichobothria (Fig. 10H) *S. latens*
9. Trichobothrium *eb* region with 2 trichobothria (Fig. 10I–K) 10
Trichobothrium *eb* region with 3 trichobothria (Fig. 10L, M) 12
10. Large troglobitic species, e.g., pedipalpal femur ca. 1.80 mm in length *S. charas*
Small epigeal species, pedipalpal femur less than 1.10 mm in length 11
11. Pedipalpal femur 0.87–0.88 (♂), 0.88–1.05 (♀) mm in length *S. dawydoffi*
Pedipalpal femur 0.76–0.84 (♂), 0.82–0.91 (♀) mm in length *S. ceylonensis*
12. Smaller in size, e.g., chela (with pedicel) 2.21–2.40 (♂), 2.275–2.475 (♀) mm in length *S. afghanica*
Larger in size, e.g., chela (with pedicel) 2.90 (♂), 3.25 (♀) mm in length *S. magnifica*

Shravana afghanica (Beier, 1959), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:59AD1064-E54D-424D-9387-D5767737FA11>
(Figs. 10M, 13)

Dhanus afghanicus Beier, 1959:264, fig. 6 (in part; see *Shravana magnifica* sp. nov.); Beier, 1960:41; Beier, 1961:1; Lindberg, 1961:31; Harvey, 1991:318; Harvey, 2013: unpaginated.

Not *Dhanus afghanicus* Beier: Beier, 1971:360–361 (misidentification; see *Shravana latens* sp. nov.).

Material examined.—Lectotype male (present designation). AFGHANISTAN: *Kabul*: Bagh-Chah Babar [34°30'N,

69°09'E], sous pierres dans le jardin, 21 June 1957, K. Lindberg (MZLU A.270).

Paralectotypes. AFGHANISTAN: *Baghlan*: 2 tritonymphs, a l'emplacement des fouilles Surkh-Kotal, near Chashmah-ye Shēr (as Tchachmēh Cher) [17 km NW. of Pol-Khomri = Puli-Khumri] [36°04'N, 68°35'E], 610 m, 10 October 1957, K. Lindberg (MZLU, A.361); *Kabul*: 2 ♂, collected with lectotype, K. Lindberg (NHMW); 2 ♀, 5 tritonymphs, Kōh-e Shēr Darwāzah (as Mont Cher Dervazéh) [34°30'N, 69°10'E], sous pierres, 20–27 September 1957, K. Lindberg (MZLU, A.400, A.409); 1 deutonymph, Qal'-éh Omar Khan, Tangi Lalander (as Tang-Lalander) [34°24'N, 69°02'E], 1820 m, sous pierres, bord du la rivière, 28 June 1957, K. Lindberg (MZLU, A.252); *Lowgar*: 1 ♀, Surkh Āb (as Sorkhab) [34°08'N, 69°12'E], 2000 m, 10 July 1957, K. Lindberg

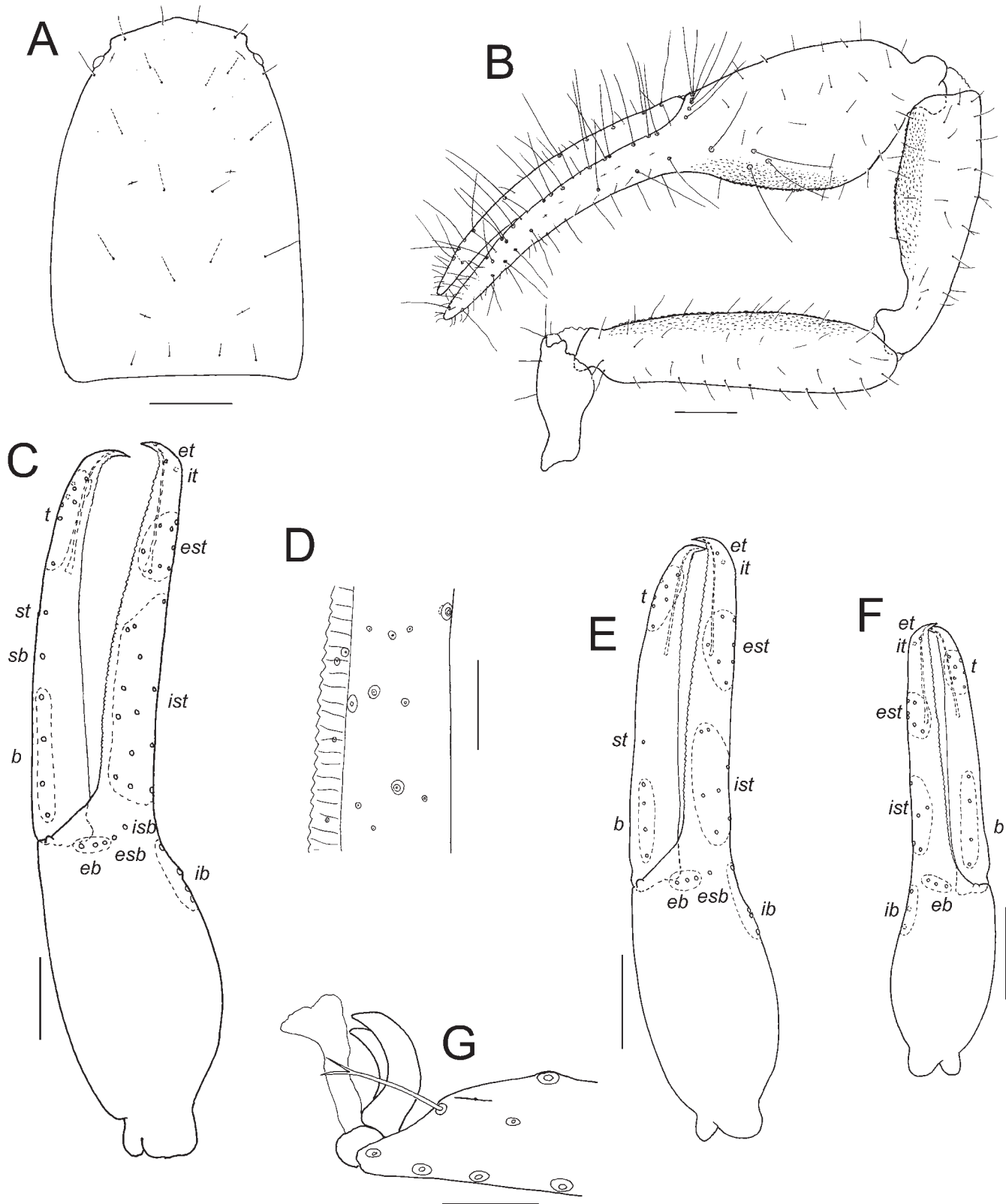


Figure 13.—*Shrivana afghanica* (Beier), male lectotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph (MZLU, A.409); F. Right chela, lateral, deutonymph (MZLU, A.252); G. Distal end of left leg IV showing arolium, claws and subterminal seta. Scale lines = 0.5 mm (A–C); 0.25 mm (E, F); 0.1 mm (D); 0.05 mm (G).

(MZLU, A.424); *Zabul*: 1 deutonymph, Gadzhoi (as Gadjoui) [32°27'N, 67°20'E], sous pierre, 10 September 1957, K. Lindberg (MZLU, A.318).

Other material. AFGHANISTAN: *Badghis*: 1 tritonymph, Darreh-ye Bum (as Darreh-Boum), between Bala Morghab and Qal'Eh-Naou [35°08'N, 63°28'E], 820 m, under stone, 3 July 1959, K. Lindberg (MZLU, A.681); *Vardak*: 1 ♂, 1 ♀, Kouh-Qorough near Tangi Sayyidān (as Tang-Saïdan), 20 km W. of Kabul [34°25'N, 69°07'E], 1820 m, under stone, 31 May 1960, K. Lindberg (MZLU).

Diagnosis.—*Shravana afghanica* differs from all other ideoroncids except *S. magnifica* by the presence of three trichobothria in the *eb* region of the chela (Figs. 10M, 13C). It differs from *S. magnifica* by its smaller size, e.g., chela (with pedicel) 2.21–2.40 (♂), 2.275–2.475 (♀) mm in length, compared with 2.90 (♂), 3.25 (♀) mm in *S. magnifica*.

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera: with 6–8 setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 8 (♂), 9 (♀) teeth; movable finger with 5 (♂), 7 (♀) teeth; rallum of 4 blades, the 3 distal blades serrate, the basal blade with very small serrations; thin lamina exterior present.

Pedipalp (Fig. 13B): trochanter and femur entirely rugose, prolateral face of patella and chela rugose, remainder of patella and chela smooth or with faint striations; trochanter 2.53–2.62 (♂), 2.44–2.50 (♀), femur 4.10–4.45 (♂), 4.10–4.30 (♀), patella 3.03–3.45 (♂), 3.01–3.10 (♀), chela (with pedicel) 3.80–4.00 (♂), 3.55–3.66 (♀), chela (without pedicel) 3.64–3.80 (♂), 3.39–3.41 (♀), hand 1.54–1.69 (♂), 1.33–1.45 (♀) x longer than broad, movable finger 1.31–1.40 (♂), 1.42–1.58 (♀) x longer than hand. Fixed chelal finger with 32 trichobothria, movable chelal finger with 14 trichobothria (Fig. 13C): *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 3 trichobothria; *ib* region with 4 (occasionally 5) trichobothria; *ist* region with 9 (occasionally 8) trichobothria; *est* region with 12 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 8 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 13C). Chelal hand without microsetae near *eb* and *esb* (Fig. 13C). Chelal teeth juxtadentate, fixed finger with ca. 70 (♂), 71 (♀) small, retrorse teeth (Fig. 13D); movable finger with ca. 68 (♂), 69 (♀) very low teeth.

Carapace (Fig. 13A): 1.36–1.61 (♂), 1.44–1.53 (♀) x longer than broad; lateral margins slightly convex; with 2 small bulging eyes; with small but distinct epistome; with 21 setae including 4 near the anterior margin and 4 near the posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 11 (♂, ♀) other setae; chaetotaxy of coxae I–IV: ♂, 8: 8: 10: 11; ♀, 7: 7: 10: 10.

Legs: femur + patella 2.90 (♂), 3.06 (♀) x longer than deep; subterminal tarsal setae deeply bifurcate (Fig. 13G); arolium longer than claws (Fig. 13G).

Abdomen: setae of tergites and sternites IX–XI faintly lanceolate. Tergites and sternites divided and uniseriate. Tergal chaetotaxy: ♂, 6: 6: 8: 9: 10: 9: 9: 9: 8: 8 (including 4 tactile setae): 6 (including 4 tactile setae): 2; ♀, 6: 6: 8: 9: 9: 11: 8: 9: 8: 8 (including 4 tactile setae): 6 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 12: (1) 17 [3 + 3] (1): (1) 9 (1): 13: 12: 10: 9: 10: 9 (including 2 tactile setae): 8 (including 2 tactile setae): 2; ♀, 9: (1) 6 (1): (1) 9 (1): 12: 12: 12: 11: 9: 8: 8 (including 2 tactile setae): 2.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with scattered pores.

Dimensions (mm): males: lectotype followed by 3 other males (when measured): Body length 4.02 (ca. 3.48–3.63). *Pedipalp*: trochanter 0.57/0.225 (0.575–0.625/0.225–0.23), femur 1.28/0.305 (1.29–1.425/0.30–0.32), patella 1.105/0.32 (1.045–1.15/0.325–0.35), chela (with pedicel) 2.24/0.56 (2.21–2.40/0.575–0.61), chela (without pedicel) 2.13 (2.095–2.27), hand length 0.945 (0.90–1.00), movable finger length 1.265 (1.26–1.355). Chelicera 0.53/0.19, movable finger length 0.33. Carapace 1.14/0.79 (1.155–1.215/0.755–0.89); eye diameter 0.055. Leg I: femur 0.595/0.20, patella 0.49/0.14, tibia 0.48/0.09, metatarsus 0.245/0.07, tarsus 0.40/0.055. Leg IV: femur + patella 0.985/0.34, tibia 0.775/0.145, metatarsus 0.335/0.105, tarsus 0.485/0.065.

Females: paralectotype from Surkh Āb followed by 3 other females (when measured): Body length 4.24 (3.84–4.70). *Pedipalp*: trochanter 0.61/0.25 (0.585–0.60/0.24), femur 1.375/0.335 (1.32–1.355/0.315–0.385), patella 1.10/0.355 (1.04–1.07/0.345–0.405), chela (with pedicel) 2.475/0.68 (2.275–2.34/0.64), chela (without pedicel) 2.32 (2.17–2.185), hand length 0.965 (0.85–0.96), movable finger length 1.40 (1.275–1.345). Chelicera 0.505/0.225, movable finger length 0.31. Carapace 1.27/0.88 (1.18–1.23/0.805–0.815); eye diameter 0.065. Leg I: femur 0.65/0.15, patella 0.32/0.14, tibia 0.54/0.09, metatarsus 0.25/0.075, tarsus 0.41/0.055. Leg IV: femur + patella 1.01/0.33, tibia 0.77/0.14, metatarsus 0.33/0.11, tarsus 0.505/0.075.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with 8 small teeth, movable finger with 5 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.33, femur 4.21, patella 3.82, chela (with pedicel) 4.28, chela (without pedicel) 4.05, hand 1.63 x longer than broad; movable finger 1.49 x longer than hand (without pedicel). Fixed chelal finger with 24 trichobothria, movable chelal finger with 11 trichobothria (Fig. 13E); *isb* and *sb* absent; *eb* and *esb* at base of finger; *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* region with 3 trichobothria; *ib* region with 4 trichobothria; *ist* region with 7 trichobothria; *est* region with 7 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *st* region with 1 trichobothrium; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 19 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 3.55. *Pedipalp*: trochanter 0.42/0.18, femur 0.99/0.235, patella 0.935/0.245, chela (with pedicel) 1.71/0.40, chela (without pedicel) 1.62, hand length 0.65, movable finger length 0.97. Carapace 0.945/0.645.

Description (deutonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger;

fixed finger with 5 small teeth, movable finger with 4 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.38, femur 3.92, patella 2.79, chela (with pedicel) 4.03, chela (without pedicel) 3.75, hand 1.48 x longer than broad; movable finger 1.59 x longer than hand (without pedicel). Fixed chelal finger with 19 trichobothria, movable chelal finger with 10 trichobothria (Fig. 13F); *esb*, *isb* and *sb* and *st* absent; *eb* and *esb* at base of finger; *et* and *it* regions each with 1 trichobothrium; *eb* region with 3 trichobothria; *ib* region with 3 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 14 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 2.89. **Pedipalp:** trochanter 0.31/0.13, femur 0.745/0.19, patella 0.545/0.195, chela (with pedicel) 1.29/0.32, chela (without pedicel) 1.20, hand length 0.475, movable finger length 0.755. Carapace 0.705/0.58.

Remarks.—Specimens of *D. afghanicus* have a lamina exterior on the chelicera and long arolia, and the species is therefore transferred to the genus *Shravana*. Beier (1959) selected three specimens from Bagh-Chah Babar as “Typen”, of which one was lodged in MZLU and the other two in NHMW. The remaining specimens were regarded as “Paratypen”. Beier’s practice of not selecting a single specimen that could serve as the holotype was briefly discussed by Harvey (1991). One of the “Paratypen” vials contains specimens that are here considered to represent a different species, named below as *Shravana magnifica*. As the type series of *D. afghanicus* consists of more than one species, a lectotype has been selected from one of the three specimens from Bagh-Chah Babar.

Some of the vials have a differing number of specimens or incorrect sexes or stages than stated by Beier (1959): the two samples from Mont Cher Dervazéh (vials A.400 and A.409) have 4 tritonymphs and 2 ♀, 1 tritonymph, respectively, but Beier (1959) stated a total of 2 ♀, 7 tritonymphs; A.252 has 1 deutonymph, but Beier (1959) stated 2 deutonymphs; A.318 has 1 deutonymph, but Beier (1959) stated 1 tritonymph.

Shravana afghanica is known from central and northern Afghanistan (Fig. 12B), where it occurs under stones. The populations from Qal’-éh Omar Khan (Kabul Province), Surkh-Kotal (Baghlan Province), Gadzhoi (Zabul Province) and Darreh-ye Bum (Badghis Province) are only represented by nymphal specimens. Adult specimens from other sites in Kabul Province are confirmed as specimens of *S. afghanica*, so the identity of the Qal’-éh Omar Khan population seems certain. However, without adults from the other sites, their identification cannot be fully confirmed. The specimens from Iran identified as *D. afghanicus* by Beier (1971) are here considered to represent a separate species, which is described below as *S. latens*.

Shravana ceylonensis (Mahnert, 1984), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:478EF853-3D17-4EFC-8FF9-8B091C95DD3D>
(Fig. 10J)

Shravana dawydoffi (Redikorzev): Beier, 1973:43 (misidentification).

Nhatrangia ceylonensis Mahnert, 1984:681–684, figs. 56–61; Harvey, 1991:322; Harvey, 2013:unpaginated; Batuwita & Benjamin, 2014:12, fig. 6A.

Material examined.—**Holotype male.** SRI LANKA: North Central Province: Medawachchiya [8°32’N, 80°29’E], 2 miles N. of Ort, forest litter, 6 February 1970, C. Besuchet, I. Löbl (MHNG).

Paratypes. SRI LANKA: North Central Province: 7 ♂, 2 ♀, 2 tritonymphs, same data as holotype (MHNG); 2 ♂, 2 tritonymphs, Mihintale [8°21’N, 80°30’E], 7 February 1970, C. Besuchet, I. Löbl (MHNG); Eastern Province: 3 ♂, 2 ♀, Kantalei [8°21’N, 81°00’E], 2 February 1970, C. Besuchet, I. Löbl (MHNG); Northern Province: 3 ♂, 1 deutonymph, Mullaittivu [9°16’N, 80°49’E], 6 February 1970, C. Besuchet, I. Löbl (MHNG); 2 ♂, 1 deutonymph, 2 miles NE. of Puliyan [8°55’N, 80°52’E], Waldstreu, 6 February 1970, C. Besuchet, I. Löbl (MHNG).

Diagnosis.—*Shravana ceylonensis* is most similar to *S. charas* and *S. dawydoffi* as all possess 2 trichobothria in the *eb* region and 4 in the *b* region (Fig. 10J). It differs from *S. dawydoffi* and *S. charas* by the dimensions of the pedipalps, e.g., pedipalpal femur 0.76–0.84 (♂), 0.82–0.91 (♀) mm in *S. ceylonensis*; 0.87–0.88 (♂), 0.88–1.05 (♀) mm in *S. dawydoffi*, and 1.945 (♂), 1.80–1.87 (♀) mm in *S. charas*.

Description (adult).—see Mahnert (1984).

Description (tritonymph).—see Mahnert (1984).

Description (deutonymph).—see Mahnert (1984).

Remarks.—This species has been thoroughly described and illustrated by Mahnert (1984). As it has a lamina exterior on the chelicera and long arolia (Mahnert 1984), it is transferred to the genus *Shravana*. *Shravana ceylonensis* is found throughout northern Sri Lanka (Fig. 12B) (Mahnert 1984; Batuwita & Benjamin 2014).

Shravana charas sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:8D8A29B5-0AD1-4000-86DC-02CF274309AF>
Figs. 10K, 14

Material examined.—**Holotype female.** MALAYSIA: Pahang: Gua Charas, ca. 3 km N. of Panching, 3°54’41.1”N, 103°08’50.2”E, 120 m, limestone cave, 7–8 July 2001, P. Schwendinger (MHNG).

Paratypes. MALAYSIA: Pahang: 1 ♀, same data as holotype (MHNG); 1 ♂, 1 ♀, same data except 1–2 June 2004 (MHNG); 1 deutonymph, Gua Charas, 25 km NW. of Kuantan, 3°54’28”N, 103°08’52”E, upper chamber, dark zone of cave, 27 June 2009, M.S. Harvey, K.L. Edward, R. Hashim, S. Dzarawi (WAM T129594).

Diagnosis.—*Shravana charas* most closely resembles *S. ceylonensis* and *S. dawydoffi* as all three species possess 2 trichobothria in the *eb* region and 4 in the *b* region (Fig. 10I–K). *Shravana charas* differs from both of these species by its larger size and very slender appendages, e.g., pedipalpal femur 1.945 (♂), 1.80–1.87 (♀) mm in length, and femur 6.17 (♂), 6.10–6.13 (♀) x longer than broad.

Description (adult).—**Color:** pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

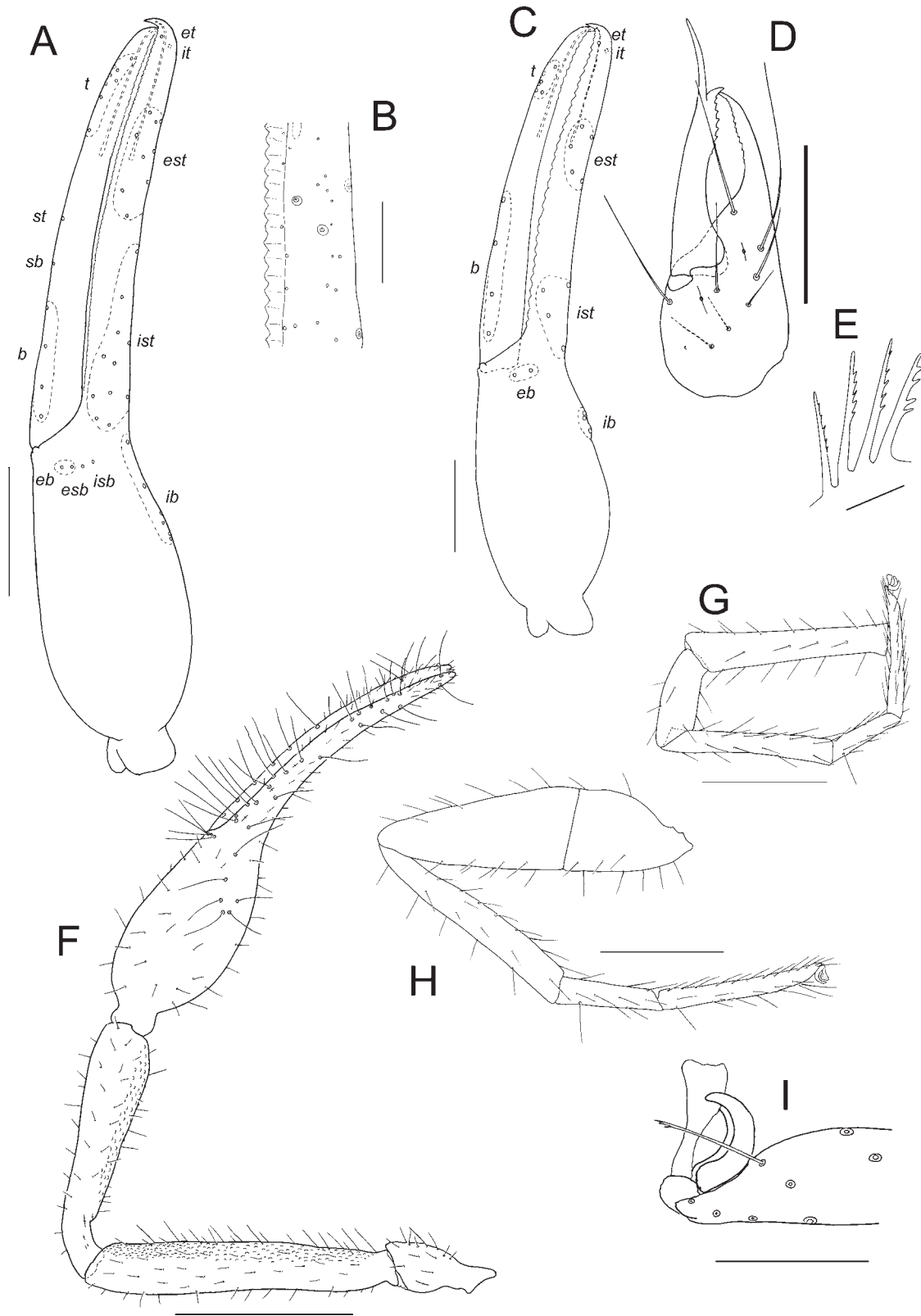


Figure 14.—*Shrivana charas* sp. nov., female holotype, unless stated otherwise: A. Left chela, lateral; B. Detail of fixed chelal finger; C. Left chela, lateral, deutonymph paratype; D. Left chelicera; E. Rallum; F. Left pedipalp, dorsal; G. Left leg I; H. Left leg IV; I. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 1.0 mm (F); 0.5 mm (A–C, G, H); 0.25 mm (B); 0.1 mm (I); 0.05 mm (E).

Chelicera (Fig. 14D): with 7 (♂), 8 (♀) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with ca. 9 (♂), 8 (♀) teeth; movable finger with ca. 6 (♂), 7 (♀) teeth; rallum (Fig. 14E) of 4 serrate blades; lamina exterior present.

Pedipalp (Fig. 14F): femur and patella rugose on prolateral face, chela finely granulate on prolateral face; trochanter 2.42 (♂), 2.35–2.39 (♀), femur 6.17 (♂), 6.10–6.13 (♀), patella 5.00 (♂), 4.37–4.63 (♀), chela (with pedicel) 5.24 (♂), 4.64–4.70 (♀), chela (without pedicel) 5.00 (♂), 4.43–4.53 (♀), hand 2.17 (♂), 1.95 (♀) x longer than broad, movable finger 1.37 (♂), 1.29–1.39 (♀) x longer than hand. Fixed chelal finger with 32 trichobothria, movable chelal finger with 14 trichobothria (Fig. 14A); *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 2 trichobothria; *ib* region with 6 trichobothria; *ist* region with 11 trichobothria; *est* region with 9 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 8 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 14A). Chelal hand without microsetae near *eb* and *esb* (Fig. 14A). Chelal teeth very low, small and retrorse (Fig. 14B), fixed finger with ca. 52 (♂), 51 (♀) teeth; movable finger with 56 (♂), 49 (♀) teeth; movable chelal finger with several distal lanceolate setae.

Carapace: 1.65 (♂), 1.49 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with well developed epistome; with 25 (♂), 26 (♀) setae, including 4 setae near anterior margin and 4 near posterior margin; with single posterior transverse furrow.

Coxal region: manducatory process with 3 long apical setae, plus 13 (♂), 12 (♀) additional setae; chaetotaxy of coxae I–IV: ♂, 10: 7: 10: 8; ♀, 7: 10: 10: 9.

Legs (Fig. 14G, H): femur + patella 3.67 (♂), 3.79 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 14I); arolium longer than claws (Fig. 14I).

Abdomen: tergites and sternites uniseriate; some tergites with small anterior impressions suggesting rudimentary division. Tergal chaetotaxy: ♂, 4: 5: 6: 7: 8: 8: 8: 8: 8: 8 (including 4 tactile setae): 6 (including 2 tactile setae): 2; ♀, 6: 6: 8: 8: 8: 8: 8: 8: 8: 8: 8 (including 4 tactile setae): 6 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 12: (1) 6 [3+3] (1): (1) 8 (1): 12: 10: 11: 10: 10: 8 (including 2 tactile setae): 9 (including 4 tactile setae): 2; ♀, 6: (1) 6 (1): (1) 7 (1): 10: 9: 9: 9: 7: 6: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): male: paratype: Body length 4.16. *Pedipalp*: trochanter 0.665/0.275, femur 1.945/0.315, patella 1.65/0.33, chela (with pedicel) 2.96/0.565, chela (without pedicel) 2.825, hand length 1.225, movable finger length 1.68. *Chelicera* 0.485/0.23, movable finger length 0.295. *Carapace* 1.375/0.835; eye diameter 0.09. *Leg I*: femur 0.95/0.175, patella 0.43/0.145, tibia 0.795/0.105, metatarsus 0.39/0.09, tarsus 0.555/0.065. *Leg IV*: femur + patella 1.375/0.375, tibia 1.065/0.145, metatarsus 0.48/0.11, tarsus 0.755/0.075.

Females: holotype followed by other female (when measured): Body length ca. 4.00 (3.63). *Pedipalp*: trochanter 0.645/

0.27 (0.625/0.27), femur 1.80/0.295 (1.87/0.305), patella 1.465/0.335 (1.505/0.325), chela (with pedicel) 2.775/0.59 (2.785/0.60), chela (without pedicel) 2.67 (2.655), hand length 1.15 (1.17), movable finger length 1.60 (1.505). *Chelicera* 0.49/0.205, movable finger length 0.28. *Carapace* 1.25/0.84; eye diameter 0.07. *Leg I*: femur 0.865/0.155, patella 0.385/0.15, tibia 0.705/0.085, metatarsus 0.325/0.08, tarsus 0.53/0.065. *Leg IV*: femur + patella 1.27/0.335, tibia 0.985/0.135, metatarsus 0.465/0.115, tarsus 0.845/0.075.

Description (deutonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with ca. 8 small teeth, movable finger with ca. 5 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.21, femur 5.44, patella 3.57, chela (with pedicel) 4.71, chela (without pedicel) 4.51, hand 1.90 x longer than broad; movable finger 1.40 x longer than hand (without pedicel). Fixed chelal finger with 16 trichobothria, movable chelal finger with 10 trichobothria (Fig. 14C); *esb*, *isb*, *sb* and *st* absent; *eb* region with 2 trichobothria; *et* and *it* regions each with 1 trichobothrium; *eb* at base of finger; *ib* region with 3 trichobothria; *ist* region with 4 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 19 setae including 4 setae near anterior margin and 3 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 2.92. *Pedipalp*: trochanter 0.365/0.165, femur 1.01/0.195, patella 0.75/0.21, chela (with pedicel) 1.65/0.35, chela (without pedicel) 1.58, hand length 0.665, movable finger length 0.93. *Carapace* 0.81/0.72.

Remarks.—*Shravana charas* is currently known only from Charas Cave, situated in the south-eastern region of peninsular Malaysia (Fig. 12A). Specimens of this species are quite large and display some clear troglomorphic features including elongate appendages (Fig. 14F). However, unlike other troglobitic ideoroncids such as *Albiorix anophthalmus* Muchmore, 1999 from Arizona (Muchmore & Pape 1999; Harvey & Muchmore 2013) and *Botswanaoncus ellisi* Harvey and Du Preez, 2014 from Botswana (Harvey & Du Preez 2014), the eyes are not noticeably reduced.

Etymology.—The specific epithet is a noun in apposition taken from the type locality.

Shravana dawydoffi (Redikorzev, 1938)

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:B8C63689-F88C-4EDC-94A4-FCFF2CAC5DE7>
(Figs. 10I, 15)

Nhatrangia dawydoffi Redikorzev, 1938:79–81, figs. 6–9; Roewer, 1940:345; Beier, 1951:67; Mahnert, 1984a:681, fig. 55; Gao & Zhang, 2013:847–848, figs. 11, 12; Harvey, 2013: unpaginated.

Shravana dawydoffi (Redikorzev): Beier, 1967:343.

Not *Shravana dawydoffi* (Redikorzev): Beier, 1973:43 (misidentification; see *Nhatrangia ceylonensis* Mahnert).

Material examined.—VIETNAM: *Ninh Thuan Province*: 1 ♂, 1 ♀, 14 km W. of Phan Rang [11°34'N, 108°53'E], 21–22 June 1960, R.E. Leech (BPBM).

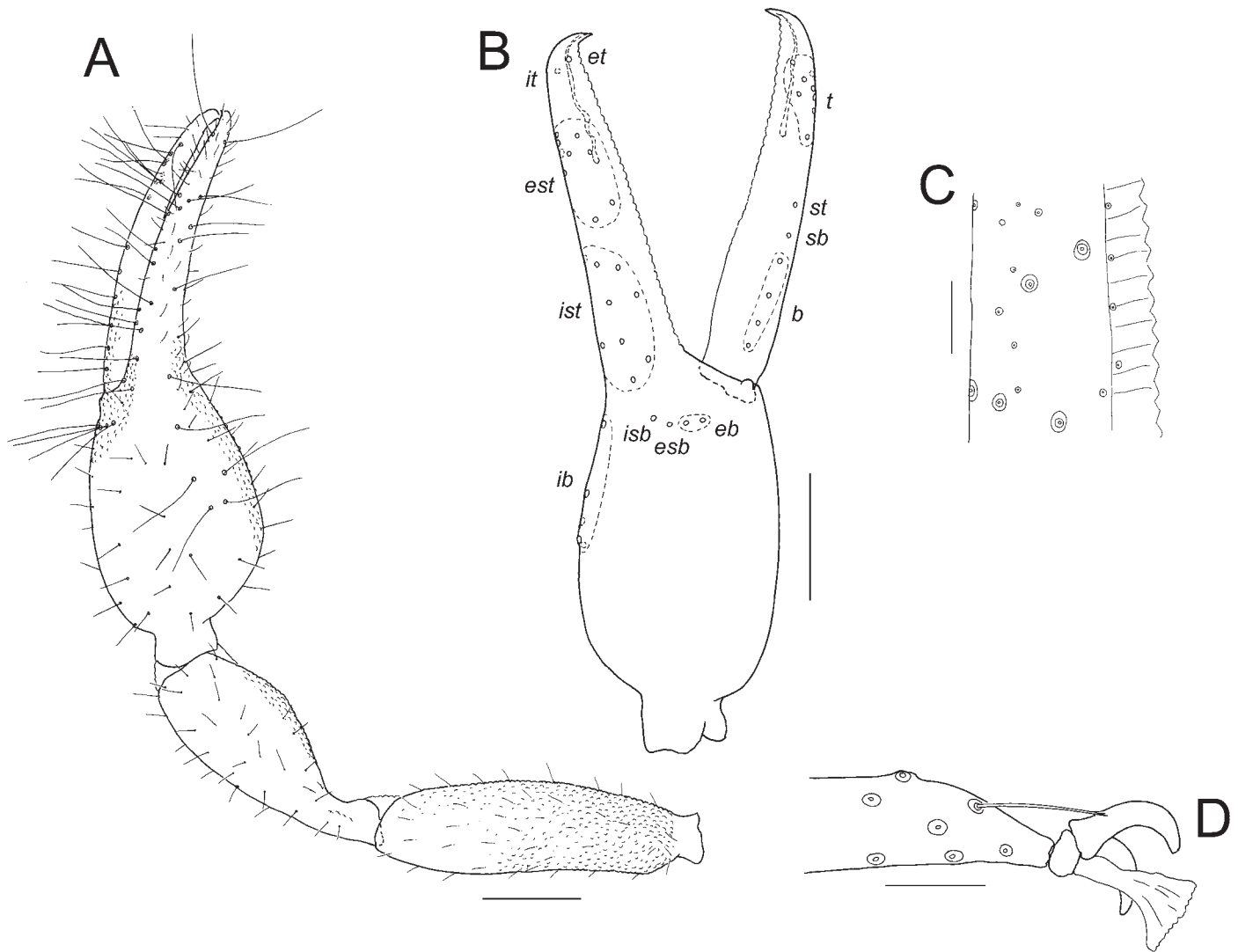


Figure 15.—*Shravana dawydoffi* (Redikorzev), male from 14 km W. of Phan Rang, Vietnam (BPBM): A. Left pedipalp, dorsal; B. Right chela, lateral; C. Detail of fixed chelal finger; E. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A, B); 0.05 mm (C, D).

Diagnosis.—*Shravana dawydoffi* is most similar to *S. ceylonensis* and *S. charas*, as all possess 2 trichobothria in the *eb* region and 4 trichobothria in the *b* region (Fig. 10I–K). It differs from *S. ceylonensis* by the presence of 10 trichobothria in the *ist* region (Fig. 10I) (9 trichobothria in *S. ceylonensis*), and by the dimensions of the pedipalps [e.g., pedipalpal femur 0.87–0.88 (♂), 0.88–1.05 (♀) mm in *S. dawydoffi*, and 0.76–0.84 (♂), 0.82–0.91 (♀) mm in *S. ceylonensis*].

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

Chelicera: with 8 (♂, ♀) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with ca. 8 (♂, ♀) teeth; movable finger with ca. 5 (♂, ♀) teeth; rallum of 4 serrate blades; lamina exterior present.

Pedipalp (Fig. 15A): prolateral face of patella, and prolateral and retrolateral faces of femur and chelal hand coarsely rugose, trochanter and retrolateral face of chelal finger finely granulate; trochanter 2.41 (♂), 2.34 (♀), femur 3.78 (♂), 3.74 (♀), patella 2.68 (♂), 2.64 (♀), chela (with pedicel) 3.33 (♂), 3.22 (♀), chela (without pedicel) 3.11 (♂), 3.01 (♀), hand 1.45 (♂), 1.40 (♀) x longer than broad, movable finger 1.22 (♂), 1.27 (♀) x longer than hand. Fixed chelal finger with 29–30 trichobothria, movable chelal finger with 14 trichobothria (Fig. 15B): *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 2 trichobothria; *ib* region with 5–6 trichobothria; *ist* region with 9 trichobothria; *est* region with 9 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 8 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal to *t* region in movable

finger (Fig. 15B). Chelal hand without microsetae near *eb* and *esb* (Fig. 15B). Chelal teeth very low, small and retrorse (Fig. 15C), fixed finger with ca. 37 (♂), 38 (♀) teeth; movable finger with ca. 36 (♂), 30 (♀) teeth.

Carapace: 1.24 (♂), 1.26 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with well developed epistome; with ca. 24 (♂), 26 (♀) setae, including 4 setae near anterior margin and 4 near posterior margin; with very shallow posterior furrow.

Coxal region: manducatory process with 3 long apical setae, plus 10 (♂, ♀) additional setae; chaetotaxy of coxae I–IV: ♂, 5: 8: 8: 9; ♀, 7: 6: 8: 10.

Legs: femur + patella 2.18 (♂), 2.33 (♀) x longer than deep; subterminal tarsal setae trifurcate (Fig. 15D); arolium slightly longer than claws (Fig. 15D).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 6: 6: 7: 8: 8: 8: 8: 8: 9: 8 (including 4 tactile setae): 9 (including 4 tactile setae): 2; ♀, 6: 6: 8: 8: 7: 8: 6: 6: 7: 7 (including 4 tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 8: (1) 12 [4+4] (1): (1) 8 (1): 12: 14: 13: 14: 11: 10: 10 (including 4 tactile setae): 2; ♀, 7: (1) 8 (1): (1) 8 (1): 14: 15: 13: 14: 12: 11: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): male: Body length 2.56. **Pedipalp:** trochanter 0.41/0.17, femur 0.87/0.23, patella 0.71/0.265, chela (with pedicel) 1.45/0.435, chela (without pedicel) 1.35, hand length 0.63, movable finger length 0.77. Chelicera 0.385/0.18, movable finger length 0.255. Carapace 0.755/0.61; eye diameter 0.055. Leg I: femur 0.38/0.115, patella 0.205/0.10, tibia 0.34/0.07, metatarsus 0.175/0.06, tarsus 0.28/0.145. Leg IV: femur + patella 0.71/0.325, tibia 0.53/0.14, metatarsus 0.23/0.095, tarsus 0.37/0.06.

Female: Body length 2.72. **Pedipalp:** trochanter 0.41/0.175, femur 0.88/0.235, patella 0.70/0.265, chela (with pedicel) 1.515/0.47, chela (without pedicel) 1.415, hand length 0.66, movable finger length 0.835. Chelicera 0.40/0.185, movable finger length 0.265. Carapace 0.78/0.62; eye diameter 0.06. Leg I: femur 0.405/0.115, patella 0.215/0.105, tibia 0.35/0.07, metatarsus 0.16/0.055, tarsus 0.26/0.04. Leg IV: femur + patella 0.71/0.305, tibia 0.52/0.15, metatarsus 0.23/0.095, tarsus 0.385/0.07.

Remarks.—*Nhatrangia dawydoffi* was described by Redikorzev (1938) based on numerous specimens collected from three localities in Vietnam: Nhatrang (now known as Nha Trang; 12°15'N, 109°11'E), Plei-Ku, Plateau de Kontum (now Plây Cu; 13°59'N, 108°00'E), and Phanrang (now Phan Rang; 11°34'N, 108°59'E). Mahnert (1984) examined two male and four female type specimens from 'Canda', which appear to be syntypes. This locality is probably a lapsus for Nhatrang, as the date of collection (October 1929) matches one of the Nha Trang collections (29 October 1929) mentioned by Redikorzev (1938). As *N. dawydoffi* has a lamina exterior on the chelicera and long arolia (Mahnert 1984) (Fig. 15D), it is here transferred to the genus *Shravana*, which renders *Nhatrangia* a junior synonym of *Shravana*, which was first proposed by Beier (1967).

The trichobothrial pattern of the syntypes is usually composed of 31 trichobothria on the fixed chelal finger and

hand, and 14 on the movable finger, although one female syntype has a pattern of 30/14 with the *ib* region having only 5 trichobothria, and a male syntype also has 30/14 with the *ib* region having only 5 trichobothria on the left chela and the *ist* region having only 9 trichobothria (Mahnert 1984). The male from 14 km W. of Phan Rang examined in this study has a pattern of 29/14 with the *ib* region having 5 trichobothria and the *ist* region having 9 trichobothria (Fig. 15B), whereas the female had a pattern of 30/14 with the *ib* region having 6 trichobothria and the *ist* region having 9 trichobothria. The two specimens examined in this study were both thought to be females by Beier (1967), but are here confirmed as a male and a female.

Shravana dawydoffi is widespread in Vietnam, Cambodia and southern Laos, and also occurs on Spratly Island in the South China Sea (Fig. 12A).

Shravana indica (Murthy & Ananthakrishnan, 1977), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:693D9C96-47C1-41F0-B8F2-685980A2EEEE>
(Figs. 10C, 16)

Dhanus indicus Murthy & Ananthakrishnan, 1977:26–28, fig. 7a, b; Harvey, 1991:318; Harvey, 2013: unpaginated.

Material examined.—INDIA: *Tamil Nadu*: 6 ♂, 3 ♀, Alagarkoil, 21 km NE. of Madurai [10°06'N, 78°13'E], 27–28 December 1989, B. & V. Roth (CAS).

Diagnosis.—*Shravana indica* is most similar to *S. laminata*, *S. schwendingeri* and *S. withi* as all possess only 1 trichobothrium in the *eb* region and 3 trichobothria in the *eb* region (Fig. 10B–E). *Shravana indica* has 1 or 2 small conical processes on the pedal coxae (Fig. 16F), carapace and pedipalps which are lacking in *S. laminata*, *S. schwendingeri* and *S. withi*, and the pedipalpal femur, patella and chelal hand are rugose (Fig. 16D), but are completely smooth in *S. laminata*, and only the femur and patella are rugose in *S. schwendingeri* and *S. withi*.

Description.—*Adults:* *Color:* pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera (Fig. 16B): with 7 long, acuminate setae on hand; movable finger with 1 long subdistal seta; galea very slender and elongate, equal-sized in ♂ and ♀; cheliceral teeth generally small and sub-equal in size, fixed finger with 7–8 (♂), 5–7 (♀) teeth, movable finger with 5–6 (♂), 7–8 (♀) teeth; rallum (Fig. 16C) of 4 thickened blades, all blades serrate; lamina exterior present.

Pedipalp (Fig. 16D): prolateral faces of femur and patella strongly rugose, prolateral and retrolateral faces of chela rugose; trochanter 2.19–2.46 (♂), 2.19–2.41 (♀), femur 3.77–4.24 (♂), 3.78–3.90 (♀), patella 2.98–3.19 (♂), 2.72–2.91 (♀), chela (with pedicel) 3.62–3.89 (♂), 3.55–3.69 (♀), chela (without pedicel) 3.41–3.68 (♂), 3.26–3.44 (♀), hand 1.50–1.54 (♂), 1.46–1.53 (♀) x longer than broad, movable finger 1.28–1.34 (♂), 1.23–1.28 (♀) x longer than hand. Fixed chelal finger with 23 trichobothria, movable chelal finger with 12 trichobothria (Fig. 16E): *eb*, *esb* and *isb* in straight line; *eb*, *esb*,

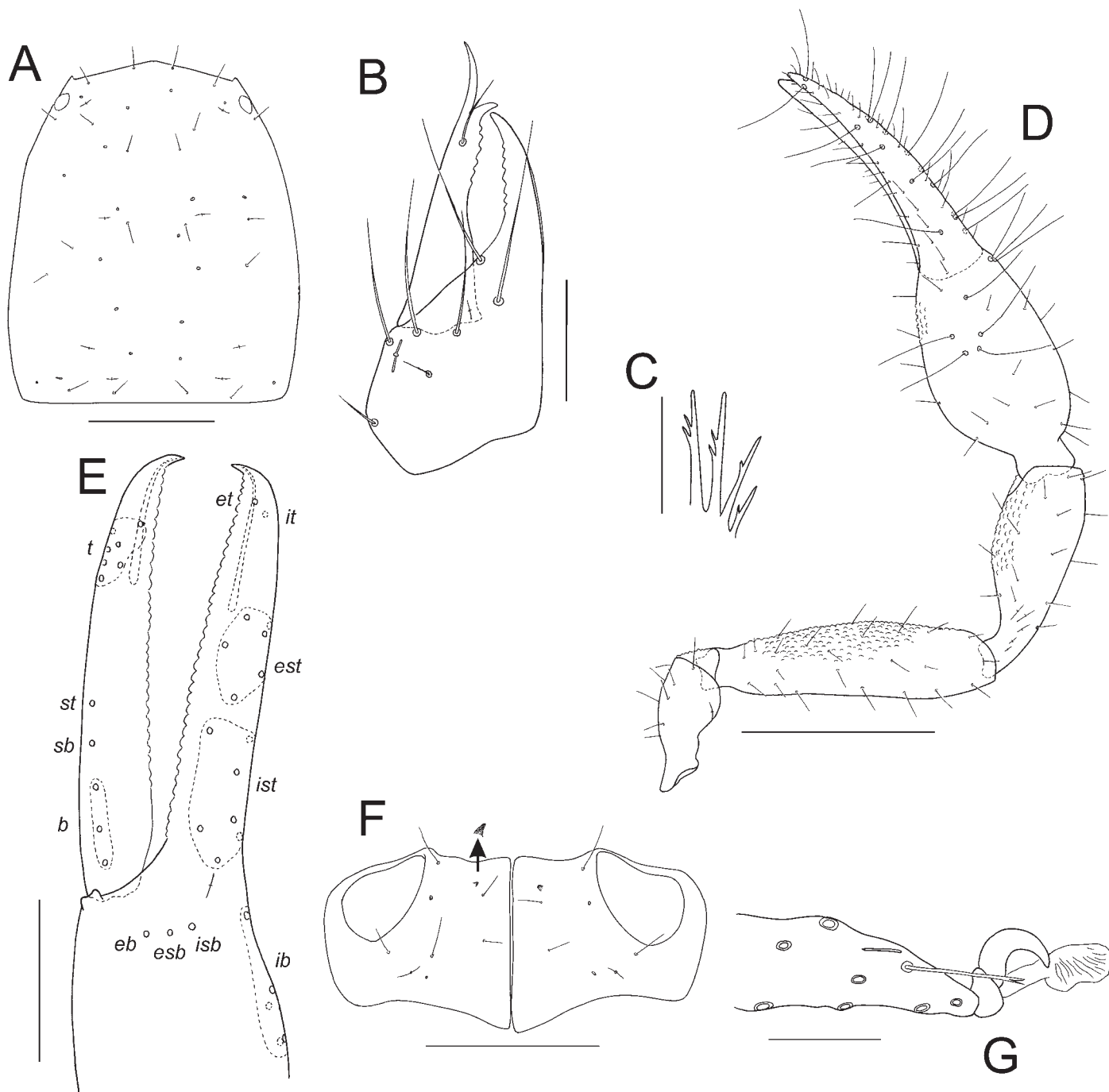


Figure 16.—*Shrivana indica* (Murthy and Ananthakrishnan), male from Alagarkoil, India (CAS): A. Carapace; B. Left chelicera; C. Right rallum; D. Right pedipalp, dorsal; E. Left chela, lateral; F. Coxae I; G. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.5 mm (D); 0.25 mm (A, E); 0.2 mm (F); 0.1 mm (B); 0.05 mm (C, G).

et, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 7 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 7 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal end of *t* region in movable finger (Fig. 16E). Chelal hand without microsetae

near *eb* and *esb* (Fig. 16E). Chelal teeth all closely spaced, fixed finger with 32 (♂), 36–37 (♀) teeth; movable finger with 29 (♂), 30–32 (♀) teeth.

Carapace (Fig. 16A): 1.21–1.39 (♂), 1.20–1.22 (♀) x longer than broad; lateral margins slightly convex; with 2 small, bulging eyes; epistome absent; with 20 (♂, ♀) setae, including 4 near anterior margin and 4 near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 11 (♂), 12 (♀) other setae; chaetotaxy of coxae I–IV: ♂, 4: 7: 7: 6–7; ♀, 4: 5–6: 7–8: 8.

Legs: femur + patella 2.39 (♂), 2.75 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 16G); arolium undivided and longer than claws (Fig. 16G).

Abdomen: tergites and sternites divided and uniseriate, all setae acuminate; tergal chaetotaxy: ♂, 5–6: 6: 7: 8: 8: 8: 8: 8: 8: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2; ♀, 5–6: 6: 7–8: 8: 8–9: 7–8: 8: 8: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2; sternal chaetotaxy: ♂, 6: (1) 8 [3 + 3] (1): (1) 6 (1): 10–13: 11–12: 10–12: 10–12: 9–10: 9–11: 8 (including 4 tactile setae): 2; ♀, 7–9: (1) 4–5 (1): (1) 6–7 (1): 11: 11: 10–12: 10: 8–10: 8–10: 8 (including 4 tactile setae): 2.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: male from Alagarkoil, India (CAS), followed by other males (when measured): Body length 2.31 (2.16–2.44). *Pedipalp*: trochanter 0.35/0.15 (0.345–0.35/0.14–0.16), femur 0.735/0.195 (0.735–0.805/0.185–0.19), patella 0.625/0.21 (0.615–0.67/0.205–0.215), chela (with pedicel) 1.27/0.345 (1.23–1.29/0.325–0.355), chela (without pedicel) 1.185 (1.16–1.21), hand length 0.525 (0.51–0.545), movable finger length 0.705 (0.675–0.695). Chelicera 0.295/0.14, movable finger length 0.19. Carapace 0.70/0.58 (0.71–0.72/0.515–0.58); eye diameter 0.045. Leg I: femur 0.345/0.095, patella 0.18/0.09, tibia 0.275/0.065, metatarsus 0.135/0.05, tarsus 0.25/0.04. Leg IV: femur + patella 0.58/0.245, tibia 0.425/0.105, metatarsus 0.105/0.07, tarsus 0.315/0.05.

Females: female from Alagarkoil, India (CAS), followed by other females (when measured): Body length 2.99 (2.34–2.96). *Pedipalp*: trochanter 0.34/0.155 0.37–(0.385/0.155–0.16), femur 0.80/0.205 (0.775–0.815/0.205–0.215), patella 0.655/0.225 (0.625–0.67/0.23–0.235), chela (with pedicel) 1.33/0.36 (1.33–1.42/0.375–0.40), chela (without pedicel) 1.24 (1.25–1.305), hand length 0.55 (0.565–0.585), movable finger length 0.705 (0.705–0.72). Chelicera 0.317/0.154, movable finger length 0.200. Carapace 0.730/0.608 (0.72–0.76/0.59); eye diameter 0.045. Leg I: femur 0.36/0.09, patella 0.185/0.095, tibia 0.29/0.065, metatarsus 0.145/0.05, tarsus 0.25/0.045. Leg IV: femur + patella 0.615/0.225, tibia 0.44/0.095, metatarsus 0.20/0.07, tarsus 0.33/0.05.

Remarks.—Although the type specimens of *Dhanus indicus* have not been available for study, a series of specimens collected from Alagarkoil, also situated in Tamil Nadu, only 115 km from Poondi (Fig. 12B), appear to represent this species as they closely match the original description. This species has a lamina exterior on the chelicera (Fig. 16B), and long arolia (Fig. 16G), and is therefore transferred to the genus *Shravana*.

Shravana indica is known only from Tamil Nadu in southern India (Fig. 12B).

***Shravana laminata* (With, 1906)**

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:7650DD9B-4A45-4AA5-86A2-D7747975BFE2>
(Figs. 10D, 17)

Ideobisium (Ideoroncus) laminatus With, 1906:84–87, plate 1 fig. 5a–c.

Shravana laminata (With): Chamberlin, 1930:48; Chamberlin, 1931:75, 167, fig. 36g–h; Beier, 1932a:176; Roewer, 1937:257; Vachon, 1949:fig. 219b (as *Shrawana* [sic] *laminata*); Weygoldt, 1966:fig. 31b (as *Shrawana* [sic] *laminata*); Weygoldt, 1969:fig. 15b; Mahnert, 1984:679–680, figs. 52–54; Harvey, 1991:322; Harvey and Vol-schenk, 2007:369, figs. 1–4; Harvey, 2013:unpaginated.

Material examined.—*Lectotype female*. THAILAND: *Trat Province*: Ko Chang (as Koh Chang) [12°00'N, 102°23'E], under a stone, January 1900, T. Mortensen (ZMC, JC–445.01001).

Paralectotype. THAILAND: *Trat Province*: 1 ♂, same data as lectotype (ZMC).

Other material. THAILAND: *Trat Province*: 23 ♂, 22 ♀, Ko Chang, west side, 12°03'N, 102°18'E, 3–23 December 1999, A. Schulz (MHNG); 2 ♂, 2 ♀, same data (WAM T140761).

Diagnosis.—*Shravana laminata* is most similar to *S. indica*, *S. schwendingeri* and *S. withi* as all possess only 1 trichobothrium in the *eb* region and 3 trichobothria in the *eb* region (Fig. 10B–E). All pedipalpal segments of *S. laminata* are smooth (Fig. 17B), whereas at least the pedipalpal femur and patella are rugose in *S. indica*, *S. schwendingeri* and *S. withi*.

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

Chelicera: with 7 (♂, ♀) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 7 (♂), 6 (♀) teeth; movable finger with 4 (♂), 4 (♀) teeth; rallum of 4 serrate blades; slender lamina exterior present.

Pedipalp (Fig. 17B): all pedipalpal segments completely smooth; trochanter 2.33–2.53 (♂), 2.00–2.50 (♀), femur 3.85–4.36 (♂), 3.70–4.04 (♀), patella 3.10–3.35 (♂), 2.90–3.25 (♀), chela (with pedicel) 3.65–4.21 (♂), 3.65–4.04 (♀), chela (without pedicel) 3.45–3.97 (♂), 3.43–3.81 (♀), hand 1.53–1.75 (♂), 1.44–1.66 (♀) x longer than broad, movable finger 1.28–1.42 (♂), 1.27–1.44 (♀) x longer than hand. Fixed chelal finger with 23 trichobothria, movable chelal finger with 12 trichobothria (Fig. 17C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 7 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 7 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 17C). Chelal hand without microsetae near *eb* and *esb* (Fig. 17C). Chelal teeth very low, small and retrorse (Fig. 17D), fixed finger with 34 (♂, ♀) teeth; movable finger with 29 (♂), 27 (♀) very low teeth.

Carapace (Fig. 17A): 1.16 (♂), 1.08 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with small epistome; with 22 (♂), 20 (♀) setae, including 4 setae near anterior margin and 4 near posterior margin; with very faint basal furrow.

Coxal region: manducatory process with 2 long apical setae, plus 9 (♂, ♀) other setae; chaetotaxy of coxae I–IV: ♂, 7: 8: 7: 9; ♀, 7: 8: 7: 9.

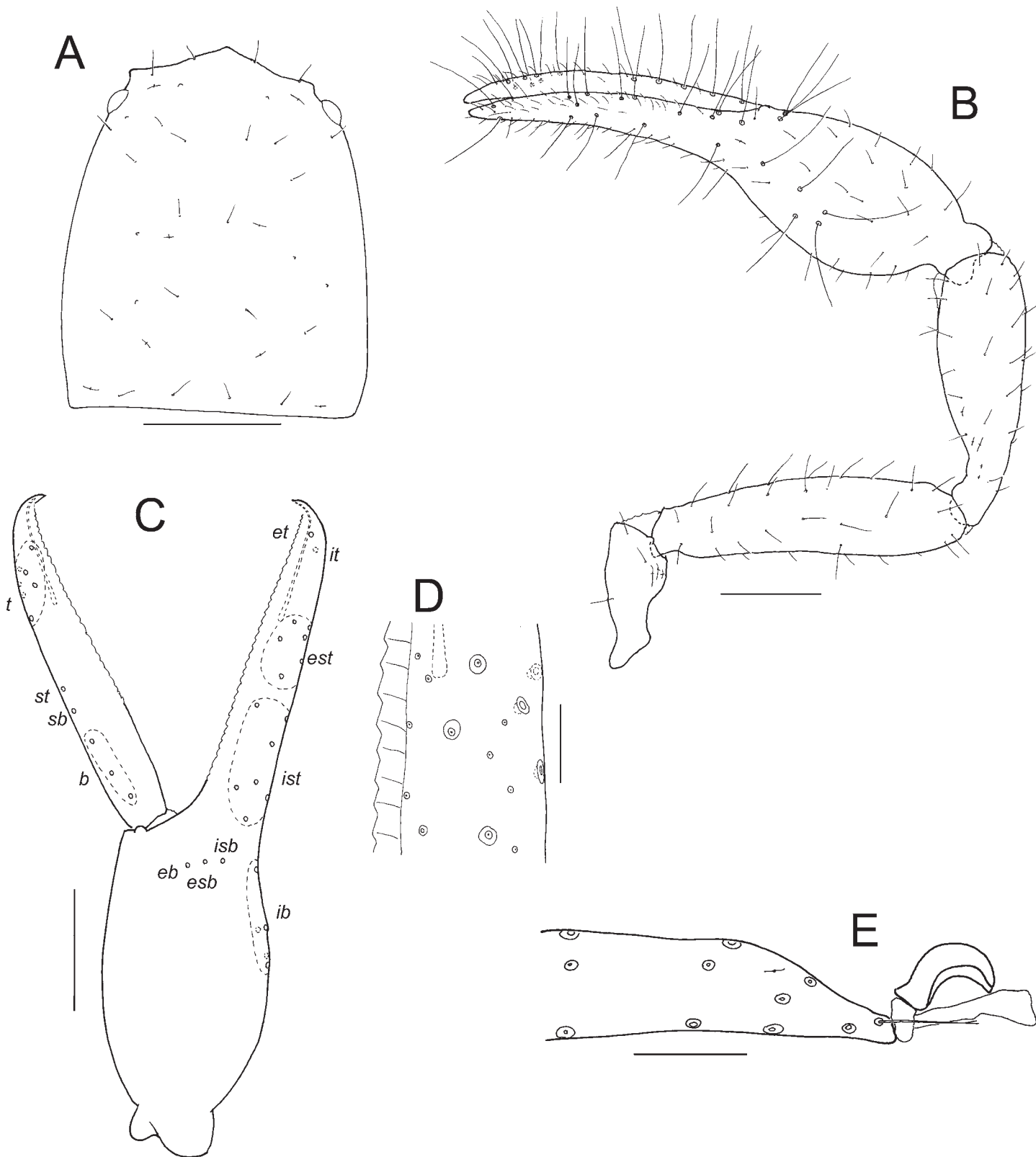


Figure 17.—*Shrivana laminata* (With), female lectotype, unless stated otherwise: A. Carapace, male from Ko Chang (MHNG); B. Right pedipalp, dorsal, male from Ko Chang (MHNG); C. Left chela, lateral; D. Detail of fixed chelal finger; E. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A–C); 0.05 mm (D, E).

Legs: femur + patella 3.05 (♂), 3.54 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 17E); arolium longer than claws (Fig. 17E).

Abdomen: tergites and most sternites divided and uniseriate. Tergal chaetotaxy: ♂, 3: 6: 8: 8: 10: 8: 8: 8: 9: 10 (including 4 tactile setae): 10 (including 4 tactile setae): 2; ♀, 5: 6: 9: 10: 10: 10: 9: 10: 9: 8 (including 4 tactile setae): 10 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 11: (1) 11 [3 + 3] (1): (1) 6 (1): 14: 12: 12: 12: 10: 5 (including 2 tactile setae): 8 (including 4 tactile setae): 2; ♀, 6: (1) 6 (1): (1) 4 (1): 14: 12: 12: 10: 11: 12: 10 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: a male from Ko Chang (MHNG) followed by 6 other males (when measured): Body length 2.60. *Pedipalp:* trochanter 0.375/0.15 (0.345–0.385/0.145–0.165), femur 0.755/0.195 (0.75–0.85/0.18–0.215), patella 0.72/0.225 (0.635–0.77/0.20–0.23), chela (with pedicel) 1.365/0.345 (1.315–1.44/0.315–0.375), chela (without pedicel) 1.29 (1.25–1.36), hand length 0.55 (0.535–0.59), movable finger length 0.765 (0.75–0.815). Chelicera 0.325/0.15, movable finger length 0.185. Carapace 0.665/0.575; eye diameter 0.06. Leg I: femur 0.40/0.095, patella 0.195/0.09, tibia 0.30/0.06, metatarsus 0.175/0.05, tarsus 0.25/0.04. Leg IV: femur + patella 0.64/0.21, tibia 0.46/0.095, metatarsus 0.235/0.07, tarsus 0.335/0.05.

Females: a female from Ko Chang (MHNG) followed by 6 other females (when measured): Body length 2.90. *Pedipalp:* trochanter 0.375/0.15 (0.315–0.42/0.15–0.17), femur 0.785/0.205 (0.785–0.91/0.20–0.225), patella 0.715/0.22 (0.67–0.77/0.21–0.25), chela (with pedicel) 1.455/0.37 (1.35–1.595/0.37–0.42), chela (without pedicel) 1.36 (1.27–1.505), hand length 0.60 (0.57–0.655), movable finger length 0.815 (0.735–0.835). Chelicera 0.335/0.16, movable finger length 0.195. Carapace 0.69/0.64; eye diameter 0.055. Leg I: femur 0.415/0.095, patella 0.20/0.095, tibia 0.31/0.06, metatarsus 0.18/0.06, tarsus 0.25/0.055. Leg IV: femur + patella 0.655/0.185, tibia 0.46/0.09, metatarsus 0.245/0.065, tarsus 0.33/0.05.

Remarks.—*Shravana laminata* is currently known only from the island of Ko Chang in the Gulf of Siam (Fig. 12A).

Shravana latens sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:169AE670-0A7C-4F4F-A2A8-FD85E0346237>
(Figs. 10H, 18)

Dhanus afghanicus Beier: Beier, 1971:360–361 (misidentification).

Material examined.—*Holotype male.* IRAN: Fārs: 5 km NE. of Takht-e-Jamshid (as Persepolis) [ca. 29°59'N, 52°52'E], under stone, 20 April 1970, F. Ressler (NHMW).

Paratypes. IRAN: Fārs: 3 ♂, 4 ♀, same data as holotype (NHMW); 2 ♂, 2 ♀, same data as holotype (WAM T62565); 2 ♂, 2 ♀, ca. 100 km W. of Shirāz [ca. 29°38'N, 51°30'E], under stone, 18 April 1970, F. Ressler, K. Bilek (NHMW); 2 ♂, 2 ♀, 2 tritonymphs, 180 km S. of Ābādān [coordinates not calculated; see Remarks], under stone, 20 April 1970, K. Bilek, F. Ressler (NHMW); *Hormozgān:* 1 ♀, 40 km N. of Bandar-e 'Abbās [ca. 27°34'N, 56°10'E], under stone, 7 April 1972, K. Bilek (NHMW); *Kermān:* 1 ♀, 80 km S. of Sīrjān [Sa'īdābād] [ca.

28°49'N, 55°40'E], under stone, 9 April 1970, F. Ressler (NHMW); 1 ♂, 1 ♀, 52 km S. of Sīrjān [Sa'īdābād] [ca. 29°10'N, 56°05'E], under stone, 17 April 1972, F. Ressler (NHMW).

Diagnosis.—*Shravana latens* differs from all other *Shravana* species except *S. taitii* by the presence of 2 trichobothria in the *eb* region and 3 trichobothria in the *b* region (Fig. 10G, 10H). It differs from *S. taitii* by the presence of 28 trichobothria on the fixed chelal finger and hand, including 9 trichobothria in the *ist* region (Fig. 10H), whereas *S. taitii* has 25 trichobothria, including 7 in the *ist* region (Fig. 10G).

Description (adult).—*Color:* pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

Chelicera (Fig. 18B): with 6 (occasionally 5 or 7) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 7 (♂), 10 (♀) teeth; movable finger with 5 (♂), 5 (♀) teeth; rallum (Fig. 18C) of 4 serrate blades; very slender lamina exterior present.

Pedipalp (Fig. 18D): anterior faces of trochanter, femur and chela lightly rugose; trochanter 2.35–2.41 (♂), 2.19–2.53 (♀), femur 4.23–4.57 (♂), 4.17–4.51 (♀), patella 3.00–3.20 (♂), 3.08–3.41 (♀), chela (with pedicel) 3.70–4.48 (♂), 3.58–4.33 (♀), chela (without pedicel) 3.54–4.10 (♂), 3.58–4.16 (♀), hand 1.26–1.50 (♂), 1.29–1.38 (♀) x longer than broad, movable finger 1.76–2.06 (♂), 1.73–2.03 (♀) x longer than hand. Fixed chelal finger with 28 trichobothria, movable chelal finger with 12 trichobothria (Fig. 18E): *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 2 trichobothria; *ib* region with 5 trichobothria; *ist* region with 9 trichobothria; *est* region with 8 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 7 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 18E). Chelal hand without microsetae near *eb* and *esb* (Fig. 18E). Chelal teeth very low, small and retrorse (Fig. 18E), fixed finger with 43 (♂), 40 (♀) teeth; movable finger with several low (♂, ♀) teeth. Movable chelal finger with several distal lanceolate setae.

Carapace (Fig. 18A): 1.44–1.63 (♂), 1.42–1.59 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with well developed epistome; with 19 (♂), 24 (♀) setae, including 4 (♂, ♀) setae near anterior margin and 5 (♂), 6 (♀) near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 9 (♂), 10 (♀) other setae; chaetotaxy of coxae I–IV: ♂, 4: 8: 8: 10; ♀, 9: 8: 10: 10.

Legs (Fig. 18G, H): femur + patella 2.45 (♂), 2.65 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 18I); arolium longer than claws (Fig. 18I).

Abdomen: tergites and sternites undivided and uniseriate; some tergites with small anterior impressions suggesting rudimentary division. Tergal chaetotaxy: ♂, 7: 6: 7: 8: 8: 8: 8: 7: 6: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2; ♀, 6: 7: 8: 8: 8: 8: 8: 9: 6: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 6: (1) 10 [3

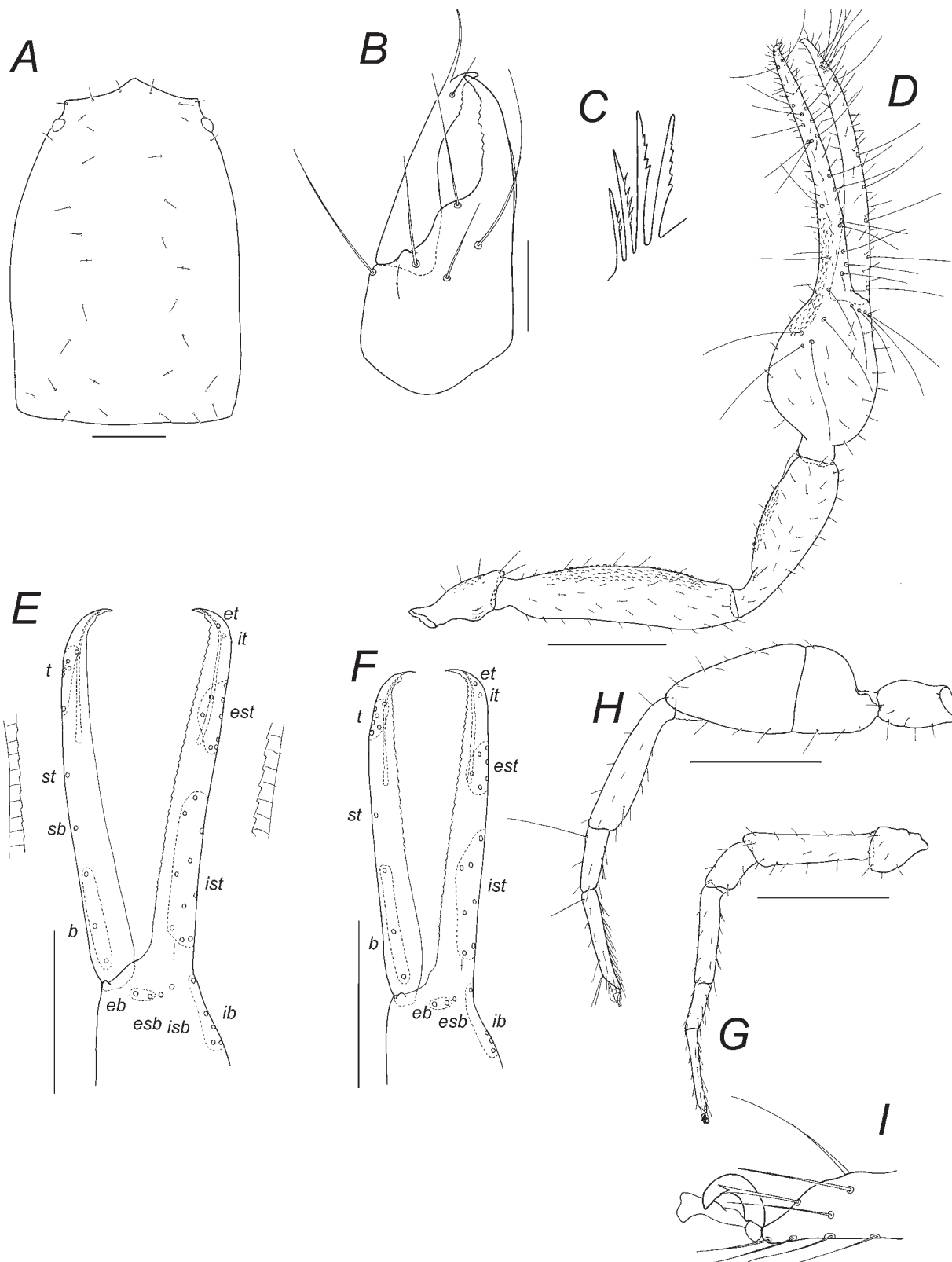


Figure 18.—*Shrivana latens* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Left chelicera; C. Rallum; D. Right pedipalp, dorsal; E. Left chela, lateral; F. Left chela, lateral, tritonymph paratype from 180 km S. of Ābādān; G. Left leg I; H. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.5 mm (D—H); 0.2 mm (A); 0.1 mm (B).

+ 3] (1): (1) 10 (1): 12: 11: 9: 10: 7: 8: 10 (including 4 tactile setae): 2; ♀, 9: (1) 8 (1): (1) 8 (1): 12: 10: 10: 10: 6: 6: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI moderately lanceolate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: holotype followed by other males (when measured): Body length 3.45 (2.5–3.3). **Pedipalp:** trochanter 0.44/0.185 (0.385–0.465/0.16–0.19), femur 1.045/0.245 (0.91–1.08/0.205–0.245), patella 0.785/0.255 (0.66–0.815/0.205–0.26), chela (with pedicel) 1.84/0.48 (1.62–1.93/0.39–0.47), chela (without pedicel) 1.75 (1.54–1.845), hand length 0.605 (0.545–0.66), movable finger length 1.17 (1.02–1.24). Chelicera 0.365/0.17, movable finger length 0.235. Carapace 0.945/0.655 (0.84–0.965/0.515–0.62); eye diameter 0.055 (0.045–0.055). Leg I: femur 0.48/0.125, patella 0.22/0.15, tibia 0.38/0.07, metatarsus 0.185/0.06, tarsus 0.315/0.045. Leg IV: femur + patella 0.81/0.33, tibia 0.57/0.13, metatarsus 0.265/0.08, tarsus 0.39/0.055.

Females: paratype (NHMW, Iran: 5 km NE. of Persepolis) followed by other females (when measured): Body length 3.7 (3.5–3.65). **Pedipalp:** trochanter 0.45/0.205 (0.45–0.49/0.18–0.21), femur 1.165/0.265 (1.06–1.28/0.235–0.275), patella 0.865/0.275 (0.77–0.955/0.24–0.28), chela (with pedicel) 2.035 (1.82–2.38/0.465–0.55), chela (without pedicel) 1.54–1.845 (1.82–2.29), hand length 0.695 (0.64–0.74), movable finger length 1.31 (1.14–1.50). Chelicera 0.42/0.175, movable finger length 0.26. Carapace 1.05/0.665 (0.91–1.08/0.60–0.66); eye diameter 0.05 (0.05–0.055). Leg I: femur 0.56/0.13, patella 0.24/0.115, tibia 0.43/0.075, metatarsus 0.19/0.045, tarsus 0.21/0.04. Leg IV: femur + patella 0.86/0.325, tibia 0.60/0.13, metatarsus 0.28/0.085, tarsus 0.40/0.065.

Description (tritonymph).—**Chelicera:** galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with 5 small teeth, movable finger with 5 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.12–2.19, femur 4.10–4.33, patella 2.98–3.09, chela (with pedicel) 4.05–4.16, chela (without pedicel) 3.85–3.95, hand 1.36–1.43 x longer than broad; movable finger 1.82–1.92 x longer than hand (without pedicel). Fixed chelal finger with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 18H); *isb* and *sb* absent; *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *eb* region with 2 trichobothria; *ib* region with 4 trichobothria; *ist* region with 7 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *st* region with 1 trichobothrium; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 22 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 2.89–3.42. **Pedipalp:** trochanter 0.34–0.35/0.155–0.165, femur 0.82–0.93/0.20–0.215, patella 0.595–0.665/0.20–0.215, chela (with pedicel) 1.56–1.66/0.375–0.41, chela (without pedicel) 1.48–1.58, hand length 0.51–0.585, movable finger length 0.98–1.005. Carapace 0.825/0.53.

Remarks.—*Shravana latens* is known only from Iran (Fig. 12B), where it has been collected from under stones in various

locations. The locality “180 km S. of Ābādān” is not included on the map, as this would be situated in southern Kuwait. It is possible that an error was made when the label was prepared, and it might be possible that the locality is actually situated east of Ābādān. This would situate the locality to within about 250 km of the other localities sampled by the collectors on the same day, 20 April 1970, 5 km NE. of Persepolis, 160 km NE. of Shiraz and 160 km E. of Shiraz (Beier 1971).

Although several specimens of *S. latens* are substantially larger than the remaining specimens, they have not been conferred separate specific status due to the lack of differences in other morphological characters (e.g., trichobothriotaxy and number of cheliceral setae).

Etymology.—The specific epithet refers to the previous misidentification of these specimens as *Dhanus afghanicus* (*latens* Latin, concealed, hidden) (Brown 1956).

***Shravana magnifica* sp. nov.**

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:75B959C8-BE52-4FC8-9629-E27C728D21AA>
(Figs. 10L, 19)

Dhanus afghanicus Beier, 1959:264, fig. 6 (misidentification, in part).

Material examined.—**Holotype male.** AFGHANISTAN: *Helmand:* Grotte Khvadjah (or Ghar-Khvadjah), north of Gereshk near the village of “Kouh-Siah Pochtéh” [Gereshk = 31°49'N, 64°34'E], 1150 m, 19 April 1958, K. Lindberg (NHMW) (also a paralectotype of *Dhanus afghanicus*).

Paratypes. AFGHANISTAN: *Helmand:* 1 ♀, 3 tritonymphs, 1 deutonymph, collected with holotype (NHMW) (also paralectotypes of *Dhanus afghanicus*).

Diagnosis.—*Shravana magnifica* differs from all other ideoroncids except *S. afghanica* by the presence of three trichobothria in the *eb* region of the chela (Fig. 10L, M). It differs from *S. afghanica* by its larger size, e.g., chela (with pedicel) 2.90 (♂), 3.25 (♀) mm in length, compared with 2.21–2.40 (♂), 2.275–2.475 (♀) mm in *S. afghanica*.

Description (adult).—**Color:** pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera: with 8 (♂, ♀) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 8 (♂), 11 (♀) teeth; movable finger with 5 (♂), 8 (♀) teeth; rallum of 4 serrate blades; thin lamina exterior present.

Pedipalp (Fig. 19B): trochanter and femur entirely rugose, retrolateral face of patella rugose, and prolateral face of chelal hand and retrolateral face of fingers rugose, remainder of chela smooth; trochanter 2.41 (♂), 2.47 (♀), femur 4.67 (♂), 4.40 (♀), patella 3.48 (♂), 3.48 (♀), chela (with pedicel) 3.92 (♂), 3.59 (♀), chela (without pedicel) 3.72 (♂), 3.41 (♀), hand 1.71 (♂), 1.54 (♀) x longer than broad, movable finger 1.23 (♂), 1.31 (♀) x longer than hand. Fixed chelal finger with 31–32 trichobothria, movable chelal finger with 14 trichobothria (Fig. 19D); *eb*, *esb* and *isb* in straight row at base of finger; *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *eb* region with 3 trichobothria; *ib* region with 5 trichobothria; *ist* region with 8–9 trichobothria; *est* region with 13 trichobothria; *et* slightly distal to *it*; *b* region with

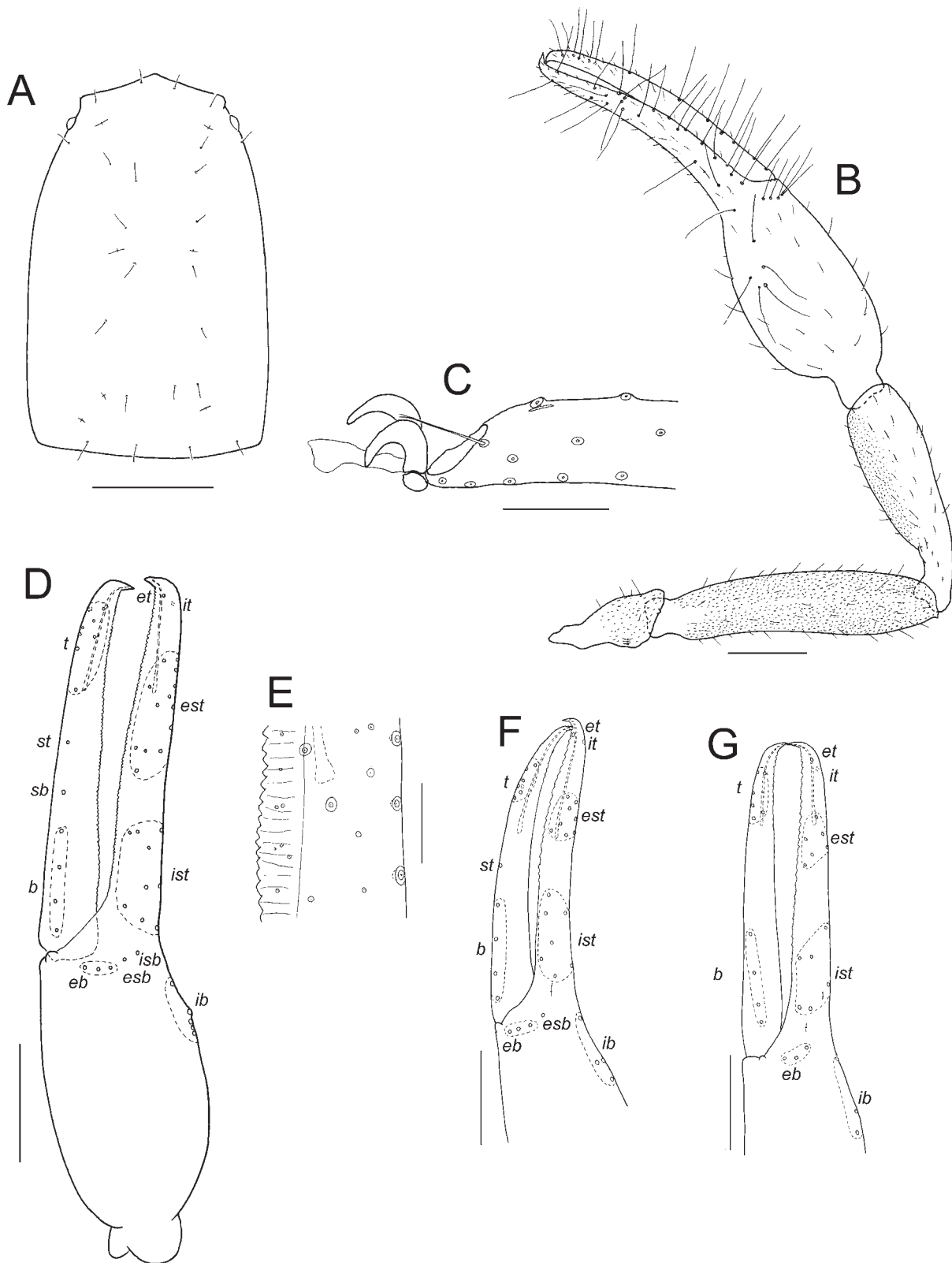


Figure 19.—*Shrivana magnifica* sp. nov, male holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Distal end of left leg IV showing arolium, claws and subterminal seta; D. Left chela, lateral; E. Detail of fixed chelal finger; F. Left chela, lateral, tritonymph paratype; G. Left chela, lateral, deutonymph paratype. Scale lines = 0.5 mm (A, B, D); 0.25 mm (F, G); 0.1 mm (E, C).

4 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 8 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 19D). Chelal hand without microsetae near *eb* and *esb* (Fig. 19D). Chelal teeth juxtadentate, fixed finger with ca. 87 (♂), 85 (♀) small, retrorse teeth (Fig. 19E); movable finger with ca. 72 (♂), 75 (♀) very low teeth.

Carapace (Fig. 19A): 1.55 (♂), 1.57 (♀) x longer than broad; lateral margins slightly convex; with 2 small bulging eyes; with small but distinct epistome; with 23 (♂), 25 (♀) setae including 4 near anterior margin and 4 (♂), 5 (♀) near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 14 (♂), 15 (♀) other setae; chaetotaxy of coxae I–IV: ♂, 11: 10: 10: 14; ♀, 12: 11: 10: 15.

Legs: femur + patella 3.04 (♂), 3.13 (♀) x longer than deep; subterminal tarsal setae deeply bifurcate (Fig. 19C); arolium longer than claws (Fig. 19C).

Abdomen: setae of tergites and sternites IX–XI acicular. Tergites and sternites divided and uniseriate. Tergal chaetotaxy: ♂, 8: 8: 10: 10: 11: 12: 12: 11: ? : ? : 2; ♀, 6: 8: 12: 12: 12: 11: 11: 12: 11: 8 (including 4 tactile setae): ? : 2. Sternal chaetotaxy: ♂, 22: (1) 24 [3 + 3] (1): (1) 15 (1): 14: 12: 12: 11: ? : ? : 2; ♀, 12: (1) 10 (1): (1) 9 (1): 11: 12: 11: 13: 13: 12 (including 4 tactile setae): 8 (including 4 tactile setae): 2.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with scattered pores.

Dimensions (mm): male: holotype: Body length ca. 4.08. **Pedipalp:** trochanter 0.70/0.295, femur 1.82/0.39, patella 1.445/0.415, chela (with pedicel) 2.90/0.74, chela (without pedicel) 2.75, hand length 1.265, movable finger length 1.55. **Chelicera** 0.59/0.255, movable finger length 0.335. **Carapace** 1.57/1.015; eye diameter 0.075. **Leg I:** femur 0.855/0.175, patella 0.40/0.165, tibia 0.705/0.12, metatarsus 0.315/0.12, tarsus 0.525/0.075. **Leg IV:** femur + patella 1.275/0.42, tibia 0.985/0.175, metatarsus 0.48/0.135, tarsus 0.645/0.085.

Female: paratype: Body length ca. 4.47. **Pedipalp:** trochanter 0.855/0.345, femur 1.89/0.43, patella 1.62/0.465, chela (with pedicel) 3.25/0.905, chela (without pedicel) 3.09, hand length 1.39, movable finger length 1.815. **Chelicera** 0.615/0.295, movable finger length 0.37. **Carapace** 1.73/1.10; eye diameter 0.09. **Leg I:** femur 0.945/0.195, patella 0.44/0.19, tibia 0.77/0.12, metatarsus 0.33/0.11, tarsus 0.60/0.08. **Leg IV:** femur + patella 1.41 /0.45, tibia 1.085 /0.19, metatarsus 0.555/0.14, tarsus 0.725/0.09.

Description (tritonymph).—**Chelicera:** galea long and slender, slightly curved; with 7 setae on hand; 1 on movable finger; fixed finger with 7 small teeth, movable finger with 5 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.38, femur 4.73, patella 3.33, chela (with pedicel) 3.73, chela (without pedicel) 3.56, hand 1.41 x longer than broad; movable finger 1.56 x longer than hand (without pedicel). Fixed chelal finger with 25 trichobothria, movable chelal finger with 11 trichobothria (Fig. 19F); *isb* and *sb* absent; *eb* and *esb* at base of finger; *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* region with 3 trichobothria; *ib* region with 4 trichobothria; *ist* region with 7 trichobothria; *est* region with 8 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *st* region with 1 trichobothrium; *t* region with 7 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 16 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 2.56. **Pedipalp:** trochanter 0.38/0.16, femur 0.945/0.20, patella 0.665/0.20, chela (with pedicel) 1.456/0.39, chela (without pedicel) 1.39, hand length 0.55, movable finger length 0.856. **Carapace** 0.96/0.66.

Description (deutonymph).—**Chelicera:** galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with 5 small teeth, movable finger with 4 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.07, femur 3.63, patella 2.78, chela (with pedicel) 3.93, chela (without pedicel) 3.71, hand 1.39 x longer than broad; movable finger 1.73 x longer than hand (without pedicel). Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 19G); *esb*, *isb* and *sb* and *st* absent; *eb* and *esb* at base of finger; *et* and *it* regions each with 1 trichobothrium; *eb* region with 2 trichobothria; *ib* region with 3 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 4 trichobothria; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 14 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 2.64. **Pedipalp:** trochanter 0.31/0.15, femur 0.745/0.205, patella 0.555/0.20, chela (with pedicel) 1.355/0.345, chela (without pedicel) 1.28, hand length 0.48, movable finger length 0.83. **Carapace** 0.72/0.55.

Remarks.—The specimens listed above were collected by Knut Lindberg of Lund University and were originally included as paratypes of *Dhanus afghanicus* by Beier (1959). However, they are much larger than typical specimens of that species and are here considered to represent a new species. Beier (1959) stated that the vial contained 1 ♂ and 1 ♀, but there are in fact 1 ♂, 1 ♀, 3 tritonymphs and 1 deutonymph. The collection data published by Beier (1959) stated “Grotte Khvadjah, Kouh-Siah Pochtéh, Farah, 19. 4. 1958”, which suggests that the site is located in Farah Province. However this cave was discussed by Lindberg (1961:19) under the name “Ghar-Khvadjah” or “Ghar-Bad Khaneh”, in Naouzar District north of Guerechk in the Province of Qandahar. The cave opening was near a village called “Siah Pochtéh”. Transliteration of Afghani place names is a difficult task, and identifying the localities listed by Beier (1959) and Lindberg (1961) has not always been possible. Guerechk is nowadays known as Gereshk and is located in Helmand Province at 31°49'N, 64°34'E. Naouzar (now known as Now Zād, 32°24'N, 64°28'E) is located 64 km north of Gereshk, but only about 30 km from the border with Farah Province. The village names “Kouh-Siah Pochtéh” or “Siah Pochtéh” could not be located definitively, but a village called “Poshteh” or “Pushtah” is located at 32°32'N, 63°36'E, which is 83 km WNW of Gereshk in Farah Province. Whether this represents the village mentioned by Beier (1959) and Lindberg (1961) might never be possible to determine. In the meantime, I treat the type locality as located somewhere north of Gereshk in Helmand Province.

Shravana magnifica is currently known from a single short cave in southern Afghanistan (Fig. 12B), although apart from

its large size it lacks any obvious modifications for cave life such as reduced eyes or elongated appendages.

Etymology.—The species epithet refers to the large size of this species (*magnificus*, Latin, noble, splendid, eminent).

Shravana pohli (Mahnert, 2007), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:D0F84D06-FCAC-4A18-92EF-8D4F466F65C6>
(Fig. 10F)

Dhanus pohli Mahnert, 2007:277–279, figs. 7–10; Harvey, 2013: unpaginated.

Material examined.—None.

Diagnosis.—*Shravana pohli* differs from all other *Shravana* species except *S. socotraensis* by the presence of only 2 trichobothria in the *b* region (Fig. 10A, F). It differs from *S. socotraensis* by the presence of 23–24 trichobothria on the fixed chelal finger and hand (Fig. 10F), whereas *S. socotraensis* has only 20 trichobothria (Fig. 10A).

Description (adult).—See Mahnert (2007).

Remarks.—This species has a lamina exterior on the chelicera and long arolia (Mahnert 2007), and is therefore transferred to the genus *Shravana*. Dr. V. Mahnert (in litt., April 2016) confirmed the numbers of chelal trichobothria (Table 1).

Shravana pohli is known only from Samha Island, in the Socotran Archipelago (Fig. 12B).

Shravana schwendingeri sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:3AD33F75-0A05-49E0-84F2-24FC3202547F>
(Figs. 10B, 20)

Material examined.—*Holotype male*. THAILAND: *Chumphon Province*: male, Khao Kai Jae Waterfall, Lang Suan District, 9°55'04.6"N, 98°56'33.7"E, semi-evergreen rainforest, 17–18 July 2002, TH-02/08, P. Schwendinger (MHNG).

Paratypes. THAILAND: *Chumphon Province*: 1 ♀, 3 tritonymphs, collected with holotype (MHNG); 1 ♂, 1 deutonymph, same data as holotype except 5–8 May 2003, 80 m, TH-03/02 (MHNG).

Diagnosis.—*Shravana schwendingeri* is most similar to *S. indica*, *S. laminata* and *S. withi* as all possess only 1 trichobothrium in the *eb* region and 3 trichobothria in the *eb* region (Fig. 10B–E). *Shravana schwendingeri* differs from *S. laminata* by the rugose pedipalpal femur and patella (Fig. 20B), which are smooth in *S. laminata* (Fig. 17B), from *S. indica* by the smooth chelal hand (Fig. 20B), which is rugose in *S. indica* (Fig. 16D), and from *S. withi* by the medial position of the trichobothria of the *ib* region (Fig. 20B) which are in the distal half of the chelal hand in *S. withi* (Fig. 21B).

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

Chelicera: with 7 (♂, ♀) setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with ca. 8 (♂), 9 (♀) teeth; movable finger with ca. 7 (♂), 6 (♀) teeth; rallum of 4 serrate blades; lamina exterior present.

Pedipalp (Fig. 20B): prolateral faces of femur and patella coarsely rugose, trochanter and chela smooth; trochanter

2.26–2.52 (♂), 2.27 (♀), femur 3.91–3.98 (♂), 3.66 (♀), patella 2.90–3.04 (♂), 2.80 (♀), chela (with pedicel) 3.59–3.72 (♂), 3.49 (♀), chela (without pedicel) 3.33–3.47 (♂), 3.26 (♀), hand 1.74–1.78 (♂), 1.62 (♀) x longer than broad, movable finger 1.04–1.08 (♂), 1.08 (♀) x longer than hand. Fixed chelal finger with 23 trichobothria, movable chelal finger with 11 trichobothria (Fig. 20C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 7 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal to *t* region in movable finger (Fig. 20C). Chelal hand without microsetae near *eb* and *esb* (Fig. 20C). Chelal teeth very low, small and retrorse (Fig. 20D), fixed finger with ca. 42 (♂), 43 (♀) teeth; movable finger with ca. 32 (♂), 28 (♀) teeth.

Carapace (Fig. 20A): 1.08–1.24 (♂), 1.11 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with well developed epistome; with 33 (♂), 32 (♀) setae, including 4 setae near anterior margin and 5 (♂), 4 (♀) near posterior margin; with very shallow posterior furrow.

Coxal region: manducatory process with 3 long apical setae, plus 11 (♂), 12 (♀) additional setae; chaetotaxy of coxae I–IV: ♂, 7: 7: 10: 11; ♀, 7: 10: 9: 9.

Legs: femur + patella 2.72 (♂), 2.94 (♀) x longer than deep; subterminal tarsal setae trifurcate (Fig. 20G); arolium slightly longer than claws (Fig. 20G).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 6: 8: 9: 11: 12: 12: 12: 13: 12 (including 4 tactile setae): 11 (including 4 tactile setae): 7 (including 4 tactile setae): 2; ♀, 7: 7: 10: 10: 11: 11: 12: 13: 12: 11 (including 4 tactile setae): 10 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 11: (1) 15 [3 + 3] (1): (1) 7 (1): 14: 14: 14: 13: 14: 10: 10 (including 4 tactile setae): 2; ♀, 5: (1) 6 (1): (1) 8 (1): 14: 13: 14: 13: 12: 11 (including 2 tactile setae): 6 (including 2 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: holotype followed by other male (when measured): Body length 2.55 (2.13). *Pedipalp*: trochanter 0.395/0.175 (0.415/0.165), femur 0.90/0.23 (0.895/0.225), patella 0.755/0.26 (0.79/0.26), chela (with pedicel) 1.40/0.39 (1.45/0.39), chela (without pedicel) 1.30 (1.355), hand length 0.67 (0.68), movable finger length 0.70 (0.72). Chelicera 0.37/0.175, movable finger length 0.245. Carapace 0.725/0.67 (0.755/0.61); eye diameter 0.06. Leg I: femur 0.435/0.11, patella 0.265/0.105, tibia 0.335/0.075, metatarsus 0.19/0.06, tarsus 0.275/0.04. Leg IV: femur + patella 0.68/0.25, tibia 0.51/0.105, metatarsus 0.27/0.08, tarsus 0.37/0.06.

Females: paratype: Body length 2.44. *Pedipalp*: trochanter 0.43/0.19, femur 0.915/0.25, patella 0.77/0.275, chela (with pedicel) 1.50/0.43, chela (without pedicel) 1.40, hand length 0.695, movable finger length 0.75. Chelicera 0.41/0.19, movable finger length 0.27. Carapace 0.785/0.705; eye diameter 0.06. Leg I: femur 0.45/0.115, patella 0.32/0.155, tibia 0.32/0.075, metatarsus 0.19/0.06, tarsus 0.18/0.18. Leg IV: femur + patella 0.72/0.245, tibia 0.495/0.11, metatarsus 0.255/0.085, tarsus 0.37/0.06.

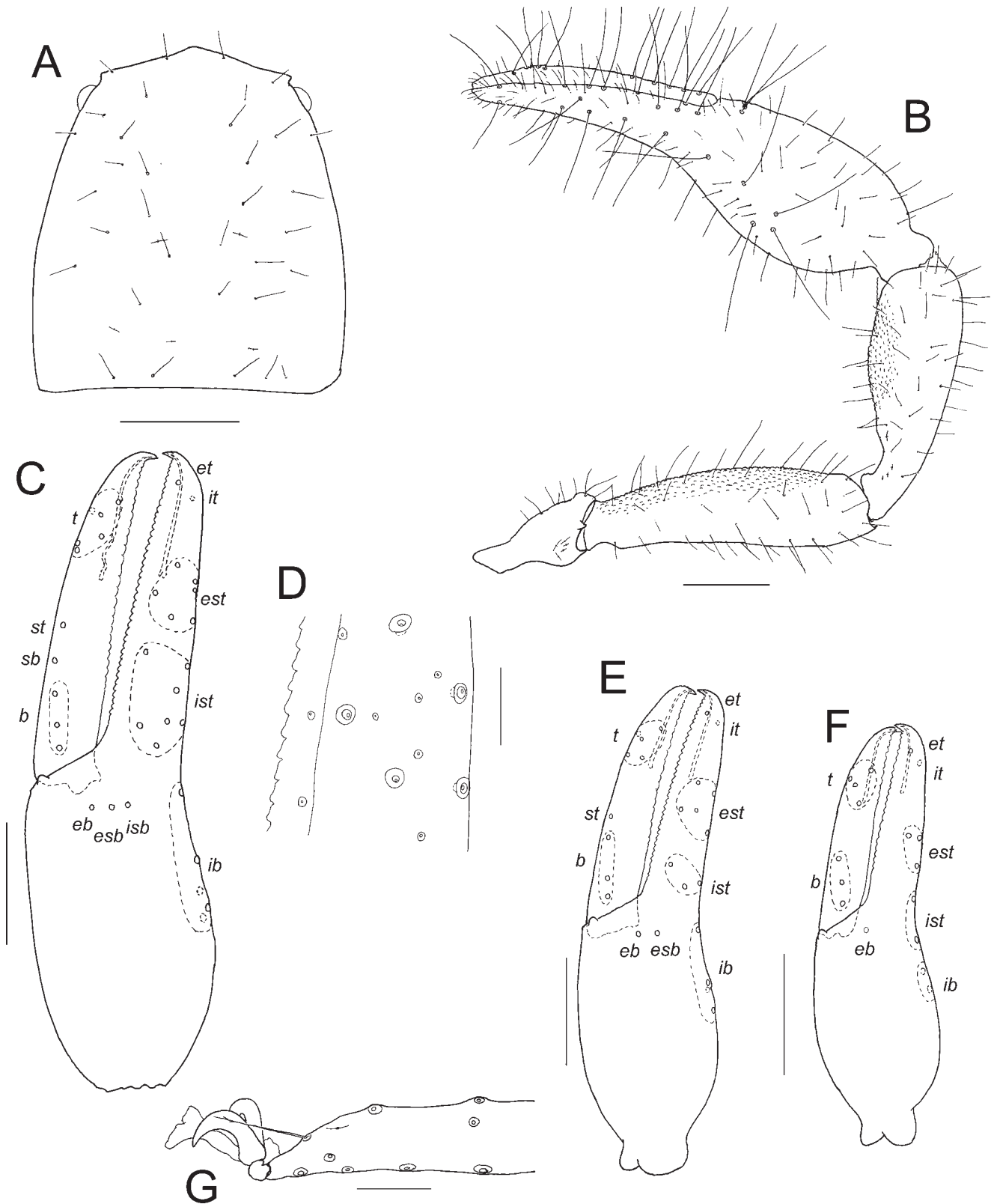


Figure 20.—*Shravana schwendingeri* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph paratype; F. Left chela, lateral, deutonymph paratype; G. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.5 mm (B); 0.25 mm (A, C, E, F); 0.05 mm (D, G).

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with ca. 13 small teeth, movable finger with ca. 8 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.38, femur 3.43, patella 2.70, chela (with pedicel) 3.48, chela (without pedicel) 3.23, hand 1.62 x longer than broad; movable finger 1.02 x longer than hand (without pedicel). Fixed chelal finger with 16 trichobothria, movable chelal finger with 8 trichobothria (Fig. 20E); *isb* and *sb* absent; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *ib* region with 4 trichobothria; *ist* region with 3 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 28 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 2.03. *Pedipalp*: trochanter 0.345/0.145, femur 0.685/0.20, patella 0.58/0.215, chela (with pedicel) 1.15/0.33, chela (without pedicel) 1.065, hand length 0.535, movable finger length 0.545. Carapace 0.64/0.615.

Description (deutonymph).—*Chelicera*: galea long and slender, slightly curved; with 5 setae on hand; 1 on movable finger; fixed finger with ca. 8 small teeth, movable finger with ca. 5 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.22, femur 3.47, patella 2.58, chela (with pedicel) 3.44, chela (without pedicel) 3.22, hand 1.56 x longer than broad; movable finger 1.06 x longer than hand (without pedicel). Fixed chelal finger with 10 trichobothria, movable chelal finger with 7 trichobothria (Fig. 20F); *esb*, *isb*, *sb* and *st* absent; *eb*, *et* and *it* regions each with 1 trichobothrium; *eb* at base of finger; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *est* region with 3 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *t* region with 4 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 20 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 1.62. *Pedipalp*: trochanter 0.255/0.115, femur 0.52/0.15, patella 0.425/0.165, chela (with pedicel) 0.86/0.25, chela (without pedicel) 0.805, hand length 0.39, movable finger length 0.415. Carapace 0.415/0.42.

Remarks.—*Shravana schwendingeri* has only been collected from Khao Kai Jae Waterfall in Chumpon Province, Thailand (Fig. 12A), where it has been found in rainforest leaf litter.

Etymology.—This species is named for Peter Schwendinger, the collector of the type specimens and many other interesting pseudoscorpions from south-east Asia.

Shravana socotraensis (Mahnert, 2007), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:7DCD9B09-417B-4AA4-BDE7-717E7BD5D6E7>
(Fig. 10A)

Dhanus socotraensis Mahnert, 2007:279–280, figs. 11–14; Harvey, 2013: unpaginated.

Material examined.—None.

Diagnosis.—*Shravana socotraensis* differs from all other *Shravana* species by the presence of only 20 trichobothria on the fixed chelal finger and 10 on the movable finger (Fig. 10A).

Description (adult).—See Mahnert (2007).

Description (deutonymph).—See Mahnert (2007).

Remarks.—This species has a lamina exterior on the chelicera, and long arolia (Mahnert 2007), and is therefore transferred to the genus *Shravana*.

Shravana socotraensis is widely distributed on Socotra (Fig. 12B).

Shravana taitii (Mahnert, 2007), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:E9F7415A-A4A9-425D-89C8-865436425671>
(Fig. 10G)

Dhanus taitii Mahnert, 2007:280–282, figs. 15–22; Harvey, 2013: unpaginated.

Material examined.—None.

Diagnosis.—*Shravana taitii* differs from all other *Shravana* species except *S. latens* by the presence of 2 trichobothria in the *eb* region and 3 trichobothria in the *b* region (Fig. 10G, H). It differs from *S. latens* by the presence of only 25 trichobothria on the fixed chelal finger and hand, including 7 trichobothria in the *ist* region (Fig. 10G), whereas *S. latens* has 28 trichobothria, including 9 in the *ist* region (Fig. 10H).

Description (adult).—See Mahnert (2007).

Description (tritonymph).—See Mahnert (2007).

Remarks.—This species has a lamina exterior on the chelicera and long arolia (Mahnert 2007), and is therefore transferred to the genus *Shravana*. *Shravana taitii* is currently known from Dejub Cave, Socotra (Fig. 12B).

Shravana withi sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:DE870D1C-F64C-43ED-ADC1-19736E027580>
(Figs. 10E, 21)

Material examined.—*Holotype male*. MALAYSIA: Pahang: Pulau Tioman, pied du Gunung Kajang, 2°47.181'N, 104°07.892'E, 160 m, rainforest, 2 October 2001, L. Monod (MHNG).

Paratypes. MALAYSIA: Pahang: 1 ♀, collected with holotype (MHNG); 1 ♂, Tioman Island, westside of Mount Kajang, 2 km E. of Kg. Genting, 2°47'N, 104°08'E, 26 June 2001, M01–39, 100 m, A. Schulz, K. Vock (MHNG); 1 ♂, 1 ♀, same data except M01–67 (MHNG); 1 ♀, 1 tritonymph, same data except M01–41 (MHNG); 1 ♀, same data except 23 June 2001, 50 m, M01–2 (MHNG); 1 ♂, same data except 28 June 2001, M01–70 (WAM T140762).

Diagnosis.—*Shravana withi* is most similar to *S. indica*, *S. laminata* and *S. schwendingeri* as all possess only 1 trichobothrium in the *eb* region and 3 trichobothria in the *eb* region (Fig. 10B–E). *Shravana withi* differs from *S. laminata* by the rugose pedipalpal femur and patella (Fig. 20B), which are smooth in *S. laminata* (Fig. 17B), and from *S. indica* by the smooth chelal hand (Fig. 20B), which is rugose in *S. indica* (Fig. 16D). It differs from *S. schwendingeri* by the position of the trichobothria of the *ib* region in distal half of the chelal

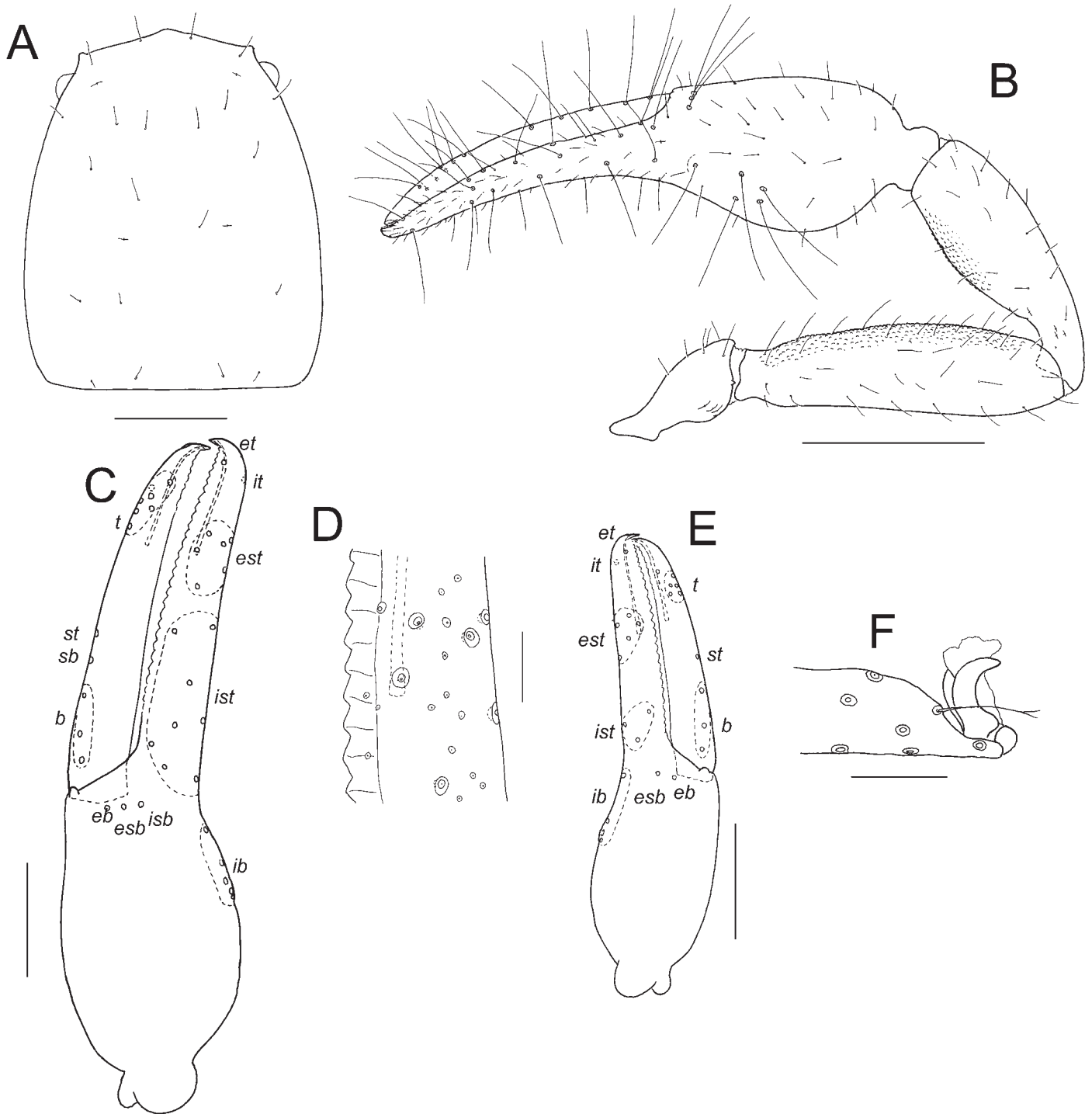


Figure 21.—*Shrivana withi* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph paratype. F. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted; Scale lines = 0.5 mm (B); 0.25 mm (A, C, E); 0.05 mm (D, F).

hand (Fig. 21B), which are situated medially in *S. schwendingeri* (Fig. 20B).

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: long, straight, acicular and generally quite slender.

Chelicera: with 7 setae on hand; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 8 (♂), 7 (♀) teeth; movable finger with 4 (♂), 6 (♀) teeth; rallum of 4 serrate blades; lamina exterior present.

Pedipalp (Fig. 21B): prolateral faces of femur and patella coarsely rugose, trochanter and chela smooth; trochanter 2.20–2.36 (♂), 2.28–2.36 (♀), femur 3.73–3.87 (♂), 3.58–3.80

(♀), patella 2.80–2.88 (♂), 2.75–2.91 (♀), chela (with pedicel) 3.51–3.61 (♂), 3.47–3.57 (♀), chela (without pedicel) 3.28–3.42 (♂), 3.28–3.39 (♀), hand 1.46–1.54 (♂), 1.42–1.53 (♀) x longer than broad, movable finger 1.25–1.41 (♂), 1.30–1.41 (♀) x longer than hand. Fixed chelal finger with 24 trichobothria, movable chelal finger with 12 trichobothria (Fig. 21C); *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 8 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 7 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal to *t* region in movable finger (Fig. 21C). Chelal hand without microsetae near *eb* and *esb* (Fig. 21C). Chelal teeth very low, small and retrorse (Fig. 21D), fixed finger with 32 (♂), 31 (♀) teeth; movable finger with 26 (♂), 29 (♀) teeth.

Carapace (Fig. 21A): 1.15–1.28 (♂), 1.06–1.22 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with well developed epistome; with 22 (♂), 20 (♀) setae, including 4 setae near anterior margin and 4 near posterior margin; with shallow posterior furrow.

Coxal region: manducatory process with 3 long apical setae, plus 9 (♂), 10 (♀) additional setae; chaetotaxy of coxae I–IV: ♂, 5: 7: 8: 10; ♀, 7: 8: 8: 9.

Legs: femur + patella 2.57 (♂), 2.60 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 21F); arolium longer than claws (Fig. 21F).

Abdomen: tergites and sternites undivided and uniseriate; some tergites with small anterior impressions suggesting rudimentary division. Tergal chaetotaxy: ♂, 4: 6: 8: 8: 10: 8: 9: 8: 8 (including 4 tactile setae): 6 (including 4 tactile setae): 2; ♀, 4: 6: 8: 8: 8: 8: 8: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 10: (1) 7 [3 + 3] (1): (1) 6 (1): 12: 10: 13: 10: 10: 10: 11 (including 6 tactile setae): 2; ♀, 7: (1) 4 (1): (1) 5 (1): 12: 10: 11: 10: 8: 8: 8 (including 2 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: holotype followed by other males (when measured): Body length 2.53 (2.23–3.25). *Pedipalp*: trochanter 0.425/0.18 (0.385–0.43/0.17–0.185), femur 0.945/0.245 (0.89–0.98/0.23–0.26), patella 0.745/0.26 (0.70–0.755/0.245–0.275), chela (with pedicel) 1.525/0.435 (1.44–1.63/0.41–0.47), chela (without pedicel) 1.435 (1.345–1.54), hand length 0.635 (0.61–0.69), movable finger length 0.845 (0.79–0.895). Chelicera 0.36/0.18, movable finger length 0.205. Carapace 0.845/0.66 (0.75–0.83/0.625–0.705); eye diameter 0.07. Leg I: femur 0.455/0.12, patella 0.225/0.11, tibia 0.33/0.08, metatarsus 0.195/0.065, tarsus 0.30/0.05. Leg IV: femur + patella 0.72/0.28, tibia 0.50/0.11, metatarsus 0.26/0.085, tarsus 0.365/0.06.

Females: paratype collected with holotype followed by other females (when measured): Body length 3.58 (2.59–2.73). *Pedipalp*: trochanter 0.445/0.195 (0.41–0.425/0.18), femur 0.97/0.255 (0.895–0.975/0.25–0.26), patella 0.80/0.275 (0.73–0.80/0.26–0.275), chela (with pedicel) 1.66/0.47 (1.56–1.64/0.45–0.46), chela (without pedicel) 1.56 (1.48–1.56), hand length 0.67 (0.64–0.705), movable finger length 0.93 (0.905–

0.92). Chelicera 0.385/0.195, movable finger length 0.23. Carapace 0.825/0.78 (0.785–0.87/0.67–0.715); eye diameter 0.065. Leg I: femur 0.51/0.135, patella 0.24/0.12, tibia 0.40/0.085, metatarsus 0.21/0.07, tarsus 0.305/0.05. Leg IV: femur + patella 0.78/0.30, tibia 0.555/0.115, metatarsus 0.30/0.09, tarsus 0.41/0.065.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; fixed finger with 5 small teeth, movable finger with 3 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.32, femur 2.64, patella 2.97, chela (with pedicel) 3.64, chela (without pedicel) 3.45, hand 1.60 x longer than broad; movable finger 1.27 x longer than hand (without pedicel). Fixed chelal finger with 16 trichobothria, movable chelal finger with 10 trichobothria (Fig. 21E); *isb* and *sb* absent; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *ib* region with 4 trichobothria; *ist* region with 3 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *b* region with 3 trichobothria; *st* region with 1 trichobothrium; *t* region with 6 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 20 setae including 4 setae near anterior margin and 4 near posterior margin.

Legs: as in adult.

Dimensions (mm): Body length 1.72. *Pedipalp*: trochanter 0.29/0.125, femur 0.655/0.18, patella 0.475/0.16, chela (with pedicel) 1.055/0.29, chela (without pedicel) 1.00, hand length 0.465, movable finger length 0.59. Carapace 0.58/0.495.

Remarks.—*Shravana withi* has only been collected from Pulau Tioman (Fig. 12A), southern Malaysia, where it occurs in rainforest leaf litter, along with *Dhanus tioman*.

Etymology.—This species is named in honor of Danish zoologist Carl Johannes With (1877–1923) in recognition of his work on pseudoscorpions, and particularly for his description of the first Asian ideoroncids (With 1906).

Sironcus gen. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:36CFD8EB-024C-410D-ACC0-401A3A8B3CCF>

Type species.—*Ideobisium* (*Ideoroncus*) *siamensis* With, 1906.

Diagnosis.—Species of *Sironcus* bear a small hooked process on the ventral surface of the arolium (e.g., Fig. 27H), a structure that is present in only four other ideoroncid genera, *Mahnertius*, *Typhloroncus* and *Xorilbia* from central and South America, and *Negroroncus* from east Africa (Harvey & Muchmore 2013). It differs from *Negroroncus* by the absence of a lamina exterior on the chelicera (Figs. 25H, 27B), from *Mahnertius* by the lack of compressed and enlarged distal teeth on the fixed chelal finger (e.g., Fig. 27E), from *Typhloroncus* by having the anal operculum separate from sternite X (Fig. 23V), and from *Xorilbia* by the undivided arolium (e.g., Fig. 27H).

Description.—*Setae*: generally long, straight or slightly curved, and acicular.

Chelicera: with 6 or 7 long, acuminate setae on hand; movable finger with 1 long medial seta; rallum of 4 thickened

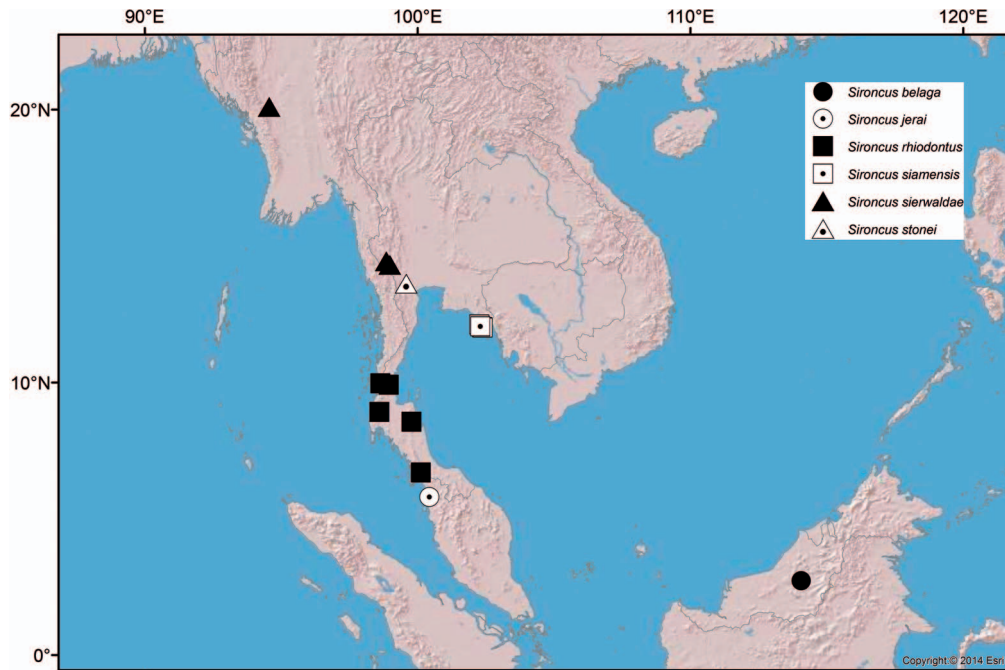


Figure 22.—Distribution of *Sironcus* species.

blades, all blades serrate; lamina exterior absent; galea long and slender.

Pedipalp: long and slender; patella with disto-prolateral excavation. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Figs. 24C, 25C, 26D, 27E, 28C, 29C): *eb* region with 1 trichobothrium; *est* region with 6 trichobothria; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *b* region with 2 trichobothria; and *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger (Figs. 24C, 25C, 26D, 27E, 28C, 29C). Chelal teeth juxtadentate (Figs. 24D, 25D, 26E, 27F, 28D); base of fixed chelal finger without small denticles (e.g., Fig. 27E); chelal hand with retrolateral condyle small and rounded; without patch of microsetae near *eb*, *esb* and *isb* (e.g., Fig. 27E).

Carapace (Figs. 24A, 25A, 26A, 27A, 28A, 29A): with 2 small, bulging eyes; epistome either absent or very small; without furrows.

Coxal region (Fig. 23A): manducatory process with 2 long distal setae; median maxillary lyrifissure present and sub-basally situated.

Legs (Figs. 25J, K & 27G): femur I and II without basal swelling; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; metatarsal pseudotactile seta sub-proximal; subterminal tarsal setae with 2 small sub-distal denticles (Figs. 24E, 25L, 26C, 27H, 28E, 29F); arolium undivided and shorter than claws, always bearing a ventral hooked process (Figs. 24E, 25L, 26C, 27H, 28E, 29F); claws slender and simple.

Abdomen: tergites and sternites undivided. Pleural membrane longitudinally striate (Fig. 23C). Each stigmatic sclerite

with 1 seta; spiracles simple, with spiracular helix. Anal operculum not abutting sternite X (Fig. 23B).

Genitalia: male median genital sac deeply bipartite; female with large gonosac covered with pores.

Remarks.—The type species of *Sironcus*, *S. siamensis*, was included in the genus *Dhanus* by Chamberlin (1930) who relied heavily on the arolium being shorter than the claws in both species to define the genus. However, as shown above, *S. siamensis* differs substantially from species of *Dhanus* in two significant features including the lack of a lamina exterior (Figs. 25H, 27B), and in the presence of a ventral hooked process on the arolium (Figs. 24E, 25L, 26C, 27H, 28E, 29F). The affinities of this genus may be with the three other ideoroncid genera with a hooked process, *Mahnertius*, *Negroroncus*, *Typhloroncus* and *Xorilbia*. It differs from each of them by the features outlined in the generic diagnosis.

The nymphal trichobothrial patterns (Fig. 25A–G) of *S. jerai* are identical to those of *Albiorix chilensis*, *Ideoroncus setosus*, *Pseudalbiorix reddelli*, *Xorilbia arboricola* and *X. gracilis*, which are the only other ideoroncids in which the complete post-embryonic trichobothrial pattern is known (Mahnert 1984; Harvey et al. 2007; Harvey & Muchmore 2013). The protonymph of *S. jerai* bears four unusual tactile setae near the *ib*, *ist*, *est* and *b* regions. The bases of these setae (8 μ m) are larger than those of normal chelal setae (4–5 μ m), but are smaller than the bothria (15 μ m). Each seta is longer than a normal seta, but shorter than a trichobothrium. It is possible that they each represent the precursor to the trichobothrium that develops at the deutonymph stage.

Members of the genus *Sironcus* occur in Myanmar, Thailand, northern peninsular Malaysia and Sarawak (Figs. 2B, 22), where they inhabit leaf litter in rainforest ecosystems.

Etymology.—The generic name is a contraction of Siam and *Roncus*, a typical suffix within the Ideoroncidae.

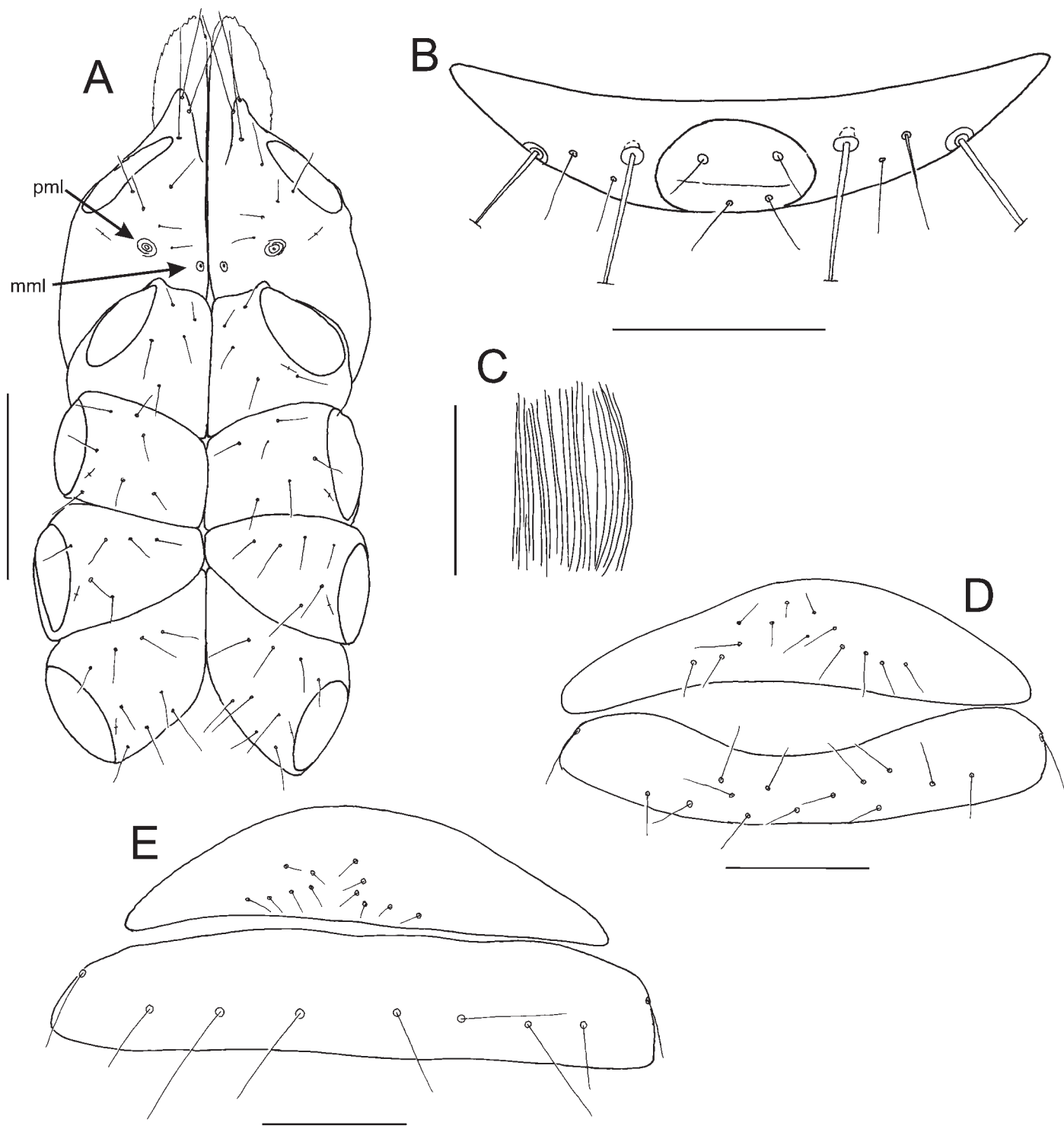


Figure 23.—*Sironcus siamensis* (With), male from Ko Chang, Thailand (MHNG), unless stated otherwise: A. Cephalothorax, ventral; B. Sternite XI and anal operculum; C. Pleural membrane; D. Sternites III and IV, male, ventral; E. Sternites III and IV, female, ventral. Abbreviations: ejca, ejaculatory canal atrium; lgs, lateral genital sac; mgs, median genital sac; mml, median maxillary lyrifissure; pml, posterior maxillary lyrifissure. Scale lines = 0.25 (B); 0.2 mm (A); 0.1 mm (C–E).

KEY TO SPECIES OF *SIRONCUS*

1. All pedipalpal segments smooth (Fig. 25B); carapace with 18 setae (Fig. 25A)..... *S. jerai*
At least some pedipalpal segments with fine granulations on prolateral face (Figs. 24B, 26B, 27D, 28B, 29B); carapace
with 23–27 setae (Figs. 24A, 26A, 27A, 28A, 29A)..... 2
2. Pedipalpal segments slightly elongated (Fig. 29B), e.g., patella 3.45 (♂), 3.39 (♀) x longer than broad *S. stonei*
Pedipalpal segments less elongate (Figs. 24B, 26B, 27D, 28B), e.g., patella 2.69–3.08 (♂), 2.47–3.15 (♀) x longer than
broad..... 3
3. Teeth of fixed chelal finger prominent, with basal face expanded (Fig. 26E) *S. rhiodontus*
Teeth of fixed chelal finger low, with basal face not expanded (Figs. 24D, 27F, 28D) 4
4. Teeth of the fixed chelal finger with rounded cusps (Fig. 24D) *S. belaga*
Teeth of the fixed chelal finger with triangular or pointed cusps (Figs. 27F, 28D)..... 5
5. Pedipalpal femur smooth (Fig. 27D)..... *S. siamensis*
Pedipalpal femur finely granulate on prolateral face (Fig. 28B)..... *S. sierwaldae*

Sironcus belaga sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:9E2DD215-FB61-48CF-BD68-836A4C4B7187>

Fig. 24

Material examined.—*Holotype male*. MALAYSIA: Sarawak: Long Linau, Belaga District [2°44'N, 114°04'E], 17–21 March 1990, A. Riedel (SMNS).

Diagnosis.—*Sironcus belaga* differs from other species of the genus by the rounded teeth of the fixed chelal finger (Fig. 24D).

Description (male).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera: with 6 setae on hand; movable finger with 1 seta; galea very slender and elongate; fixed finger with ca. 8 teeth; movable finger with ca. 5 teeth; rallum of 4 blades, the 3 distal blades serrate, the basal blade with very small serrations; lamina exterior absent.

Pedipalp (Fig. 24B): prolateral face of femur and patella granulate, other segments smooth; trochanter 2.31, femur 3.62, patella 2.69, chela (with pedicel) 3.74, chela (without pedicel) 3.51, hand 1.58 x longer than broad, movable finger 1.28 x longer than hand. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 24C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 24C). Chelal hand without microsetae near *eb* and *esb* (Fig. 24C). Chelal teeth juxtadentate, fixed finger with 48 teeth, mostly low and rounded (Fig. 24D); movable finger with 39 very low, rounded teeth.

Carapace (Fig. 24A): 0.84 x longer than broad; lateral margins slightly convex; with 2 small bulging eyes; epistome absent; with 27 setae, including 4 near anterior margin and 4 near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 6 additional setae; chaetotaxy of coxae I–IV: 4: 6: 5: 7.

Legs: femur + patella 2.56 x longer than deep; subterminal tarsal setae bifurcate (Fig. 24E); arolium undivided, shorter than claws, bearing a ventral hooked process (Fig. 24E).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: 4: 5: 10: 12: 13: 14: 14: 15: 15: 11 (including 4 tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: 10: (1) 17 [3 + 3] (1): (1) 13 (1): 14: 16: 16: 16: 15: 15: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite.

Dimensions (mm): male: holotype: Body length 1.60. *Pedipalp*: trochanter 0.30/0.13, femur 0.615/0.17, patella 0.475/0.18, chela (with pedicel) 1.03/0.275, chela (without pedicel) 0.965, hand length 0.435, movable finger length 0.555. Chelicera 0.315/0.145, movable finger length 0.22. Carapace 0.48/0.57; eye diameter 0.035. Leg I: femur 0.315/0.09, patella 0.16/0.085, tibia 0.205/0.06, metatarsus 0.13/0.05, tarsus 0.20/0.05. Leg IV: femur + patella 0.50/0.195, tibia 0.34/0.09, metatarsus 0.17/0.07, tarsus 0.29/0.55.

Remarks.—*Sironcus belaga* has only been collected from Long Linu, in central Sarawak (Fig. 22). Long Linu is located a few km south and upstream of the Bakun Hydroelectric Dam, 2°44'N, 114°04'E (see Sagin et al. 2001).

Etymology.—The species epithet is a noun in apposition taken from Belaga District.

Sironcus jerai sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:5CE9F81B-BFB6-4DD9-B8DC-21EEC1E3688A>

Fig. 25

Dhanus siamensis (With): Harvey, 1992:figs. 58–67 (misidentification).

Material examined.—*Holotype female*. MALAYSIA: Kedah: Gunong Jerai, 5°48'N, 100°26'E, 550 m, rainforest berlesate, 12 September 1982, R.W. Taylor, R.A. Barrett (ANIC).

Paratypes. MALAYSIA: Kedah: 1 tritonymph, 1 deutonymph, 4 protonymphs, collected with holotype (ANIC); 1 tritonymph, 1 deutonymph, 1 protonymph, collected with holotype (WAM T91/1351–1353).

Diagnosis.—*Sironcus jerai* differs from other species of the genus by the smooth pedipalpal segments (Fig. 25B), and only 18 carapaceal setae (Fig. 25A). In all other species, at least the

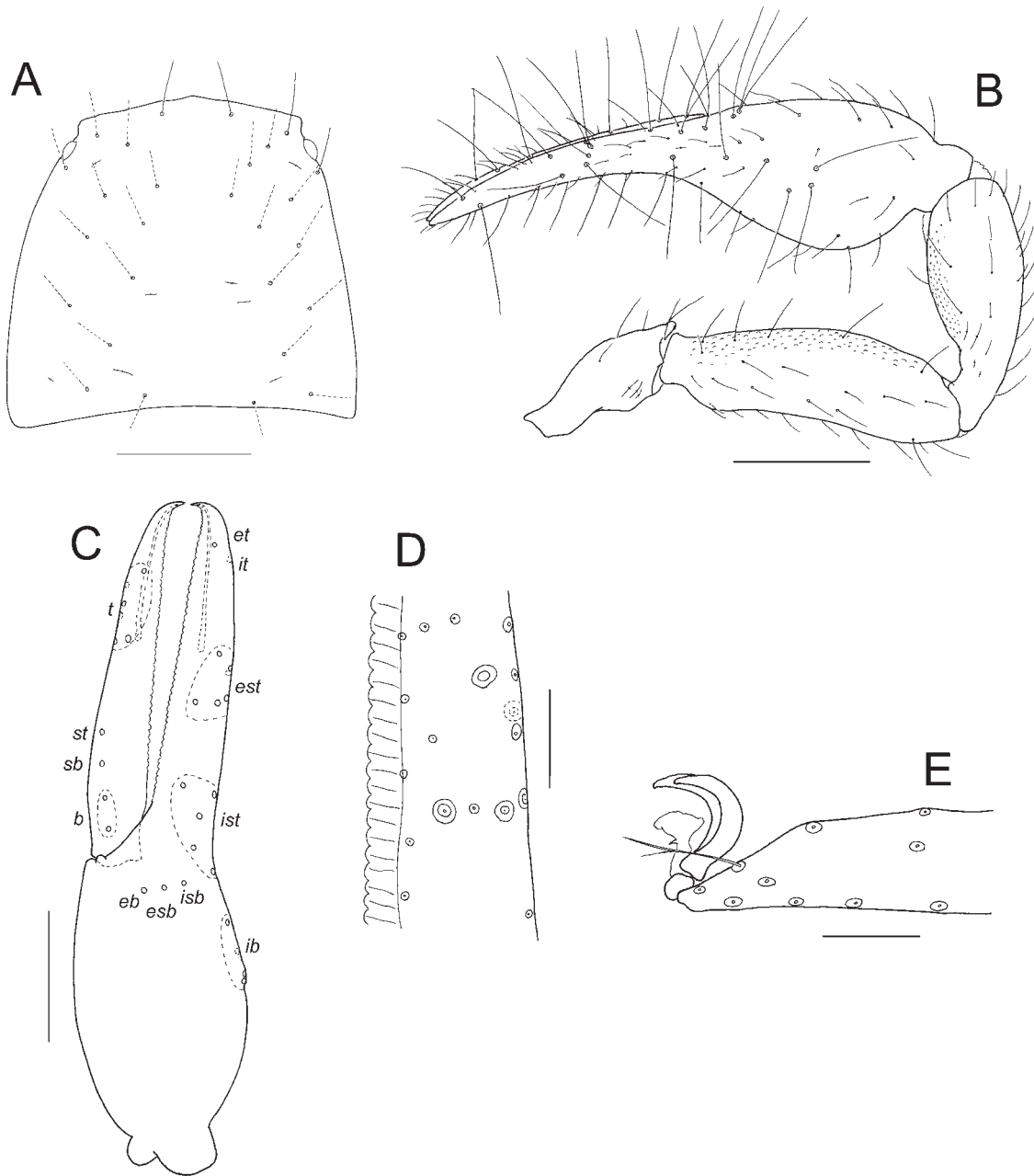


Figure 24.—*Sironcus belaga* sp. nov., male holotype: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (B); 0.2 mm (A, B); 0.05 mm (D, E).

femur and patella is granulate on the prolateral face, and the carapace bears 23–27 setae.

Description (female).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera (Fig. 25H): with 6 setae on hand; movable finger with 1 seta; galea very slender and elongate; fixed finger with 8 teeth; movable finger with 6 small teeth; rallum (Fig. 25I) of 4 blades, the 3 distal blades serrate, the basal blade with very small serrations; lamina exterior absent.

Pedipalp (Fig. 25B): segments smooth; trochanter 2.21, femur 3.42, patella 2.47, chela (with pedicel) 3.35, chela (without pedicel) 3.18, hand 1.47 x longer than broad, movable finger 1.20 x longer than hand. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 25C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct

terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 25C). Chelal hand without microsetae near *eb* and *esb* (Fig. 25C). Chelal teeth juxtadentate, fixed finger with 47 teeth, mostly truncate (Fig. 25D); movable finger with 37 very low teeth.

Carapace (Fig. 25A): 1.02 x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with extremely small epistome; with 18 setae, including 4 near anterior margin and 2 near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 5 additional setae; chaetotaxy of coxae I–IV: 4: 5: 5: 5.

Legs (Fig. 25J, K): femur + patella 2.50 x longer than deep; subterminal tarsal setae bifurcate (Fig. 25L); arolium undivided, shorter than claws, bearing a ventral hooked process (Fig. 25L).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: 4: 4: 9: 9: 9: 10: 14: 11: 11: 12 (including 2 tactile setae): 12 (including 4 tactile setae): 2. Sternal chaetotaxy: 8: (1) 4 (1): (1) 5 (1): 8: 11: 11: 13: 12: 13 (including 2 tactile setae): 10 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: with large gonosac covered with pores.

Dimensions (mm): female: holotype: Body length 1.84. **Pedipalp**: trochanter 0.31/0.14, femur 0.65/0.19, patella 0.47/0.19, chela (with pedicel) 1.14/0.34, chela (without pedicel) 1.08, hand length 0.50, movable finger length 0.67. **Chelicera** 0.33/0.16, movable finger length 0.21. **Carapace** 0.54/0.53; eye diameter 0.05. **Leg I**: femur 0.34/0.10, patella 0.17/0.09, tibia 0.22/0.06, metatarsus 0.14/0.06, tarsus 0.20/0.04. **Leg IV**: femur + patella 0.55/0.22, tibia 0.38/0.10, metatarsus 0.19/0.08, tarsus 0.29/0.05.

Description (tritonymph).—**Chelicera**: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.30, femur 3.07, patella 2.25, chela (with pedicel) 3.43, chela (without pedicel) 3.21, hand 1.30 x longer than broad; movable finger 1.40 x longer than hand (without pedicel). Fixed chelal finger with 14 trichobothria, movable chelal finger with 8 trichobothria (Fig. 25E); *isb* and *sb* absent; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *ib* region with 3 trichobothria; *ist* region with 4 trichobothria; *est* region with 3 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: anterior margin with very small epistome; with 2 small bulging eyes; with 18 setae including 4 setae near anterior margin and 2 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 1.50. **Pedipalp**: trochanter 0.23/0.10, femur 0.46/0.15, patella 0.36/0.16, chela (with pedicel) 0.79/0.23, chela (without pedicel) 0.74, hand length 0.30, movable finger length 0.42. **Carapace** 0.41/0.48.

Description (deutonymph).—**Chelicera**: galea long and slender, slightly curved; with 5 setae on hand; 1 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.00, femur 3.67, patella 1.92, chela (with pedicel) 3.50, chela (without pedicel) 3.31, hand 1.44 x longer than broad; movable finger 1.39 x longer than hand (without pedicel). Fixed chelal finger with 9 trichobothria, movable chelal finger with 6 trichobothria (Fig. 25F); *esb*, *isb*,

sb and *st* absent; *eb* at base of finger; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *est* region with 2 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 4 trichobothria.

Carapace: anterior margin with very small epistome; with 2 small bulging eyes; with 16 setae including 4 setae near anterior margin and 2 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 1.15. **Pedipalp**: trochanter 0.18/0.09, femur 0.33/0.09, patella 0.23/0.09, chela (with pedicel) 0.56/0.16, chela (without pedicel) 0.53, hand length 0.23, movable finger length 0.32. **Carapace** 0.33/0.33.

Description (protonymph).—**Chelicera**: galea long and slender, slightly curved; with 4 setae on hand; 0 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 1.88, femur 3.43, patella 1.90, chela (with pedicel) 3.83, chela (without pedicel) 3.58, hand 1.50 x longer than broad; movable finger 1.39 x longer than hand (without pedicel). Fixed chelal finger with 3 trichobothria, movable chelal finger with 1 trichobothrium (Fig. 25G); *eb*, *et*, *ist* and *t* present; single pseudo-trichobothria present near *ib*, *ist*, *est* and *b* region.

Carapace: anterior margin with very small epistome; with 2 small bulging eyes; with 14 setae including 4 setae near anterior margin and 2 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 0.79. **Pedipalp**: trochanter 0.15/0.08, femur 0.24/0.07, patella 0.19/0.10, chela (with pedicel) 0.46/0.12, chela (without pedicel) 0.43, hand length 0.18, movable finger length 0.25. **Carapace** 0.275/0.245.

Remarks.—*Sironcus jerai* has only been collected from Gunong Jerai, in north-western Malaysia (Fig. 22).

Etymology.—The species epithet is a noun in apposition taken from the type locality, Gunong Jerai.

***Sironcus rhiodontus* sp. nov.**

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:C7C4D52A-EE54-459D-93D1-102A6CD8AF80>

(Fig. 26)

Material examined.—**Holotype male**. THAILAND: *Chumphon Province*: near border Lang Suan - Phato Districts, Khao Kai Jae Waterfall, 9°55'04.6"N, 98°56'33.7"E, 5–8 May 2003, semi-evergreen rainforest, P. Schwendinger (MHNG).

Paratypes. THAILAND: *Chumphon Province*: 2 ♂, 3 ♀, collected with holotype (MHNG); 1 ♂, 1 ♀, collected with holotype (WAM T140763); 5 ♂, 3 ♀, 1 deutonymph, Lang Suan District, Khao Kai Jae Waterfall, 9°55'04.6"N, 98°56'33.7"E, 80 m, 17–18 July 2002, semi-evergreen rainforest, P. Schwendinger (MHNG).

Other material examined. THAILAND: *Nakhon Si Thammarat Province*: 1 ♂, Khao Luang National Park, Ay Khieo Waterfall, 8°33'25.0"N, 99°46'36.1"E, 25 November 2001, semi-evergreen rainforest, P. Schwendinger (MHNG); *Phangnga Province*: 2 ♂, 3 ♀, 1 tritonymph, Khao Sok National Park, 30 km E. of Takua Pa, 8°55'N, 98°36'E, 21–26 December 1997, secondary moist forest with primary spots, A. Schulz (MHNG); *Ranong Province*: 1 ♀, Ranong, outside town behind Jansom Thara Hotel [9°58'N, 98°38'E], 50 m, semi-evergreen rainforest, 18 September 1992, P. Schwen-

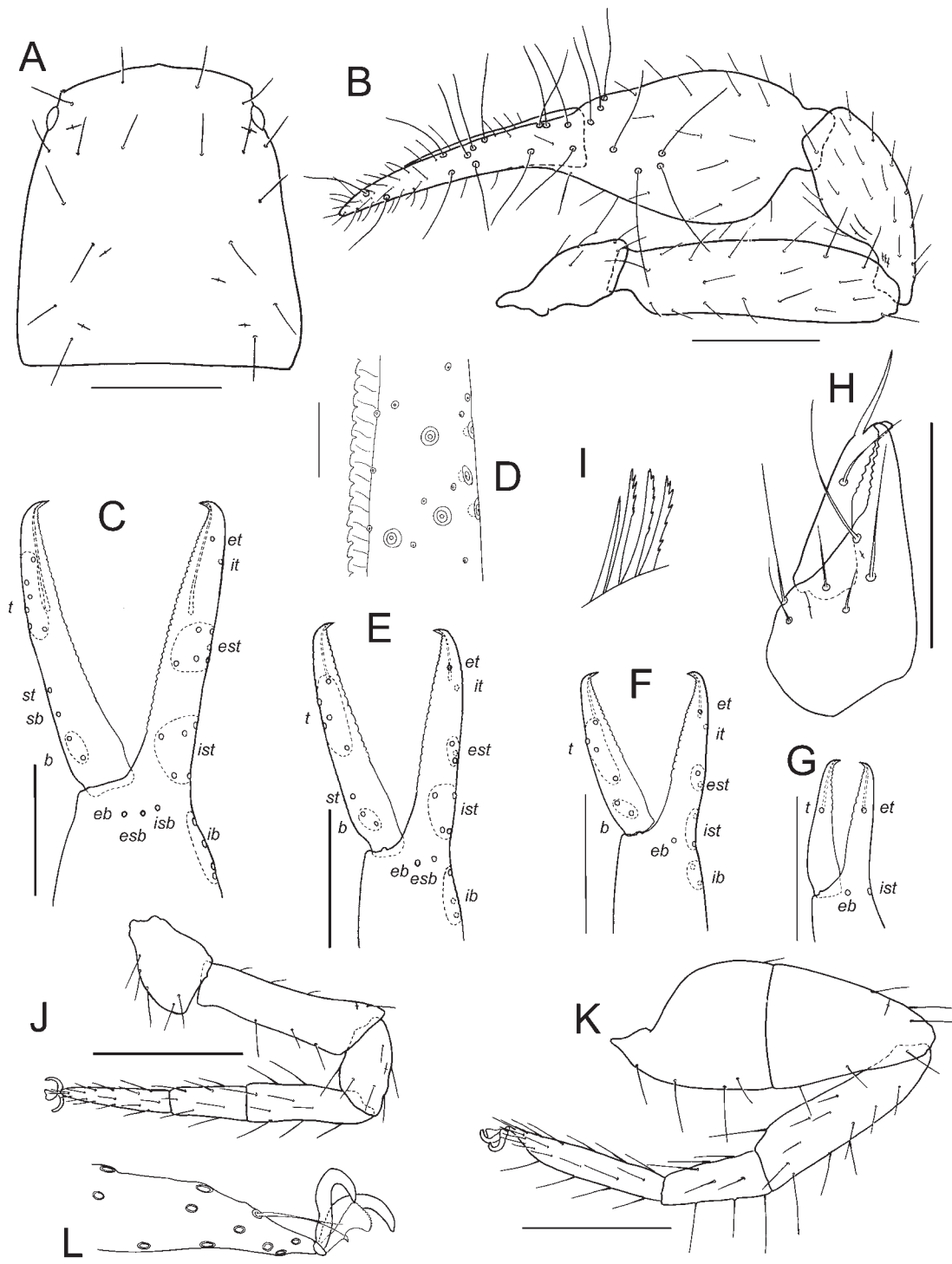


Figure 25.—*Sironcus jerai* sp. nov., female holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph; F. Left chela, lateral, deutonymph; G. Left chela, lateral, protonymph; H. Left chelicera; I. Rallum; J. Left leg I; K. Left leg IV; L. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A–C, E–H, J, K); 0.05 mm (D, L).

dinger (MHNG); *Satun Province*: 3 ♂, 1 ♀, Thaleban National Park, 6°42'N, 100°07'E, 1–5 January 1998, primary moist forest, A. Schulz, K. Vock (MHNG).

Diagnosis.—*Sironcus rhodontus* differs from all other species of the genus by the expanded basal face of the chelal teeth of the fixed finger (Fig. 26E).

Description (adult).—*Color*: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera: with 6–7 (♂), 7 (♀) setae on hand; movable finger with 1 seta; galea very slender and elongate; fixed finger with 7 (♂), 8 (♀) teeth; movable finger with 7 (♂, ♀) small teeth; rallum of 4 serrate blades; lamina exterior absent.

Pedipalp (Fig. 26B): femur and patella lightly granulate on prolateral surface, remaining segments smooth; trochanter 2.04–2.37 (♂), 2.19–2.39 (♀), femur 3.72–4.24 (♂), 3.93–4.04 (♀), patella 2.83–3.08 (♂), 2.81–2.97 (♀), chela (with pedicel) 3.88–4.14 (♂), 3.68–3.81 (♀), chela (without pedicel) 3.73–3.91 (♂), 3.45–3.64 (♀), hand 1.53–1.66 (♂), 1.47–1.62 (♀) x longer than broad, movable finger 1.35–1.50 (♂), 1.30–1.39 (♀) x longer than hand. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 26D): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 26D). Chelal hand without microsetae near *eb* and *esb* (Fig. 26D). Chelal teeth juxtadentate, fixed finger with 40 (♂), 39 (♀) teeth, most with expanded basal face (Fig. 26E); movable finger with 29 (♂, ♀) low teeth.

Carapace (Fig. 26A): 1.06–1.11 (♂), 0.90–0.97 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with small epistome; with 23 (♂), 26 (♀) setae, including 6 setae near the anterior margin and 4 near the posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 7 (♂, ♀) additional setae; chaetotaxy of coxae I–IV: ♂, 7: 8: 7: 8; ♀, 5: 9: 8: 11.

Legs: femur + patella 2.44 (♂), 2.61 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 26C); arolium undivided, shorter than claws, bearing a ventral hooked process (Fig. 26C).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 4: 4: 6: 8: 8: 9: 9: 12: 13 (including 4 tactile setae): 10 (including 4 tactile setae): 8 (including 4 tactile setae): 2; ♀, 4: 4: 7: 10: 10: 11: 11: 13: 13: 11 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 8: (1) 12 [3 + 3] (1): (1) 13 (1): 13: 15: 14: 16: 14 (including 2 tactile setae): 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2; ♀, 8: (1) 8 (1): (1) 11 (1): 17: 16: 18: 19: 20: 15 (including 4 tactile setae): 10 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: holotype followed by other males (when measured): Body length 1.55 (1.36–1.61). *Pedipalp*: trochanter 0.275/0.135 (0.29–0.32/0.135), femur 0.67/0.17 (0.67–0.72/0.165–0.18), patella 0.505/0.175 (0.50–0.555/0.175–0.18), chela (with pedicel) 1.16/0.29 (1.11–1.32/0.275–0.36), chela (without pedicel) 1.11 (1.065–1.12), hand length 0.445 (0.445–0.475), movable finger length 0.67 (0.61–0.67). Chelicera 0.315/0.15, movable finger length 0.20. Carapace 0.515/0.465 (0.51–0.535/0.45–0.50); eye diameter 0.505. Leg I: femur 0.36/0.10, patella 0.215/0.095, tibia 0.225/0.065, metatarsus 0.175/0.06, tarsus 0.235/0.045. Leg IV: femur + patella 0.585/0.24, tibia 0.39/0.105, metatarsus 0.215/0.075, tarsus 0.345/0.06.

Females: paratype followed by other females (when measured): Body length 2.36 (1.40–1.66). *Pedipalp*: trochanter 0.355/0.155 (0.34–0.37/0.155), femur 0.825/0.21 (0.805–0.83/0.20–0.21), patella 0.59/0.21 (0.58–0.605/0.195–0.205), chela (with pedicel) 1.39/0.365 (1.325–1.45/0.35–0.40), chela (without pedicel) 1.33 (1.26–1.33), hand length 0.58 (0.535–0.59), movable finger length 0.785 (0.74–0.785). Chelicera 0.41/0.19, movable finger length 0.26. Carapace 0.57/0.635 (0.55–0.56/0.565–0.59); eye diameter 0.06. Leg I: femur 0.45/0.11, patella 0.235/0.165, tibia 0.285/0.075, metatarsus 0.21/0.065, tarsus 0.26/0.045. Leg IV: femur + patella 0.705/0.27, tibia 0.475/0.11, metatarsus 0.265/0.085, tarsus 0.40/0.055.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.26, femur 3.79, patella 2.76, chela (with pedicel) 3.89, chela (without pedicel) 3.70, hand 1.64 x longer than broad; movable finger 1.30 x longer than hand (without pedicel). Fixed chelal finger with 14 trichobothria, movable chelal finger with 8 trichobothria (Fig. 26F); *isb* and *sb* absent; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *ib* region with 3 trichobothria; *ist* region with 4 trichobothria; *est* region with 3 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 22 setae including 6 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 1.85. *Pedipalp*: trochanter 0.305/0.135, femur 0.625/0.165, patella 0.455/0.165, chela (with pedicel) 1.09/0.28, chela (without pedicel) 1.035, hand length 0.46, movable finger length 0.60. Carapace 0.485/0.46.

Description (deutonymph).—*Chelicera*: galea long and slender, slightly curved; with 5 setae on hand; 1 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.33, femur 3.77, patella 2.46, chela (with pedicel) 4.00, chela (without pedicel) 3.81, hand 1.59 x longer than broad; movable finger 1.39 x longer than hand (without pedicel). Fixed chelal finger with 9 trichobothria, movable chelal finger with 6 trichobothria (Fig. 26G); *esb*, *isb*, *sb* and *st* absent; *eb* at base of finger; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *est* region with 2 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 4 trichobothria.

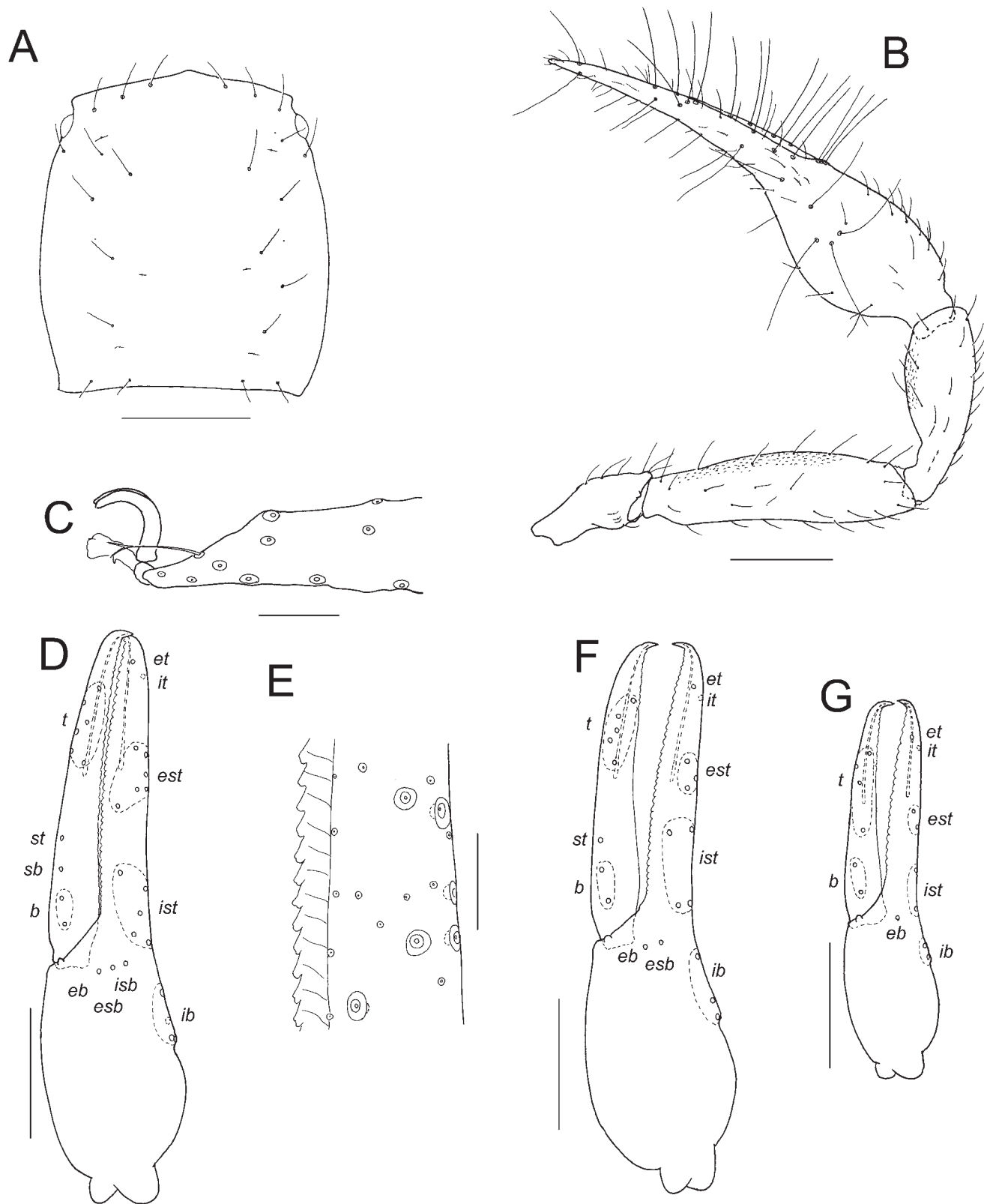


Figure 26.—*Sironcus rhiodontus* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted; D. Left chela, lateral; E. Detail of fixed chelal finger; F. Left chela, lateral, tritonymph; G. Left chela, lateral, deutonymph. Scale lines = 0.25 mm (B, D, F, G); 0.2 mm (A); 0.05 mm (E, G).

Carapace: anterior margin medially prominent; with 2 small bulging eyes; with 17 setae including 5 setae near anterior margin and 2 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length 1.20. *Pedipalp*: trochanter 0.21/0.09, femur 0.415/0.11, patella 0.295/0.12, chela (with pedicel) 0.74/0.185, chela (without pedicel) 0.705, hand length 0.295, movable finger length 0.41. Carapace 0.395/0.37.

Remarks.—*Sironcus rhodontus* occurs in rainforest habitats in southern Thailand (Fig. 22).

Etymology.—The species epithet refers to the enlarged teeth of fixed chelal finger which bear a basal overhanging portion (*rhion*, Greek, a jutting part of a mountain, peak, headland; *odontos*, Greek, tooth) (Brown 1956).

Sironcus siamensis (With), comb. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:1D51B4AF-ED7C-4587-953A-8C7AB2D71B65>

(Figs. 23, 27)

Ideobisium (Ideoroncus) siamensis With, 1906:81–84, plate 1 fig. 4a–i.

Dhanus siamensis (With): Chamberlin, 1930:47; Beier, 1932a:174, fig. 8; Beier, 1932b:figs. 200c, 208; Roewer, 1936:figs. 37a–b, 83g, 86, 107a–b; Roewer, 1937:257; Harvey, 1991:318; Schawaller, 1994:737, fig. 33 (misidentification, in part); Judson, 1997:40; Harvey, 2013:unpaginated.

Not *Dhanus siamensis* (With): Harvey, 1992:figs. 58–67 (misidentification, see *Sironcus jera*).

Material examined.—*Lectotype male (present designation)*. THAILAND: *Trat Province*: Ko Chang [as Koh Chang] [ca. 12°00'N, 102°23'E], 6 January 1900, T. Mortensen (ZMC).

Paralectotypes. THAILAND: *Trat Province*: 1 ♀, same data as lectotype except 5 January 1900 (ZMC); 1 ♂, Khlong Salak Phet (as Klong Salakpet) [12°01'N, 102°22'E], 13 March 1900, T. Mortensen (ZMC, JC–446.01001).

Other material examined. THAILAND: *Trat Province*: 1 ♂, 2 ♀, Ko Chang National Park, Khlong Phrao Waterfall and hill near White Sand Beach [12°07'N, 102°16'E], 100 m, 23–25 August 1992, P. Schwendinger (MHNG); 36 ♂, 21 ♀, Ko Chang, west side, 12°03'N, 102°18'E, 3–23 December 1999, A. Schulz (MHNG); 2 ♂, 2 ♀, same data (WAM T140764).

Diagnosis.—*Sironcus siamensis* differs from all other species of the genus except *S. sierwaldae* by the triangular cusps of the teeth of the fixed chelal finger (Fig. 27F), and differs from *S. sierwaldae* by the completely smooth pedipalpal femur (Fig. 27D).

Description (adult).—*Color*: pedipalps and carapace deep yellow-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera (Fig. 27B): with 6–7 (♂, ♀) setae on hand; movable finger with 1 seta; galea very slender and elongate; fixed finger with 11 (♂, ♀) teeth; movable finger with 7 (♂), 8 (♀) small teeth; rallum (Fig. 27C) of 4 blades, all serrate; lamina exterior absent.

Pedipalp (Fig. 27D): segments smooth, except for minute denticles on prolateral face of patella; trochanter 1.52–2.33

(♂), 2.00–2.38 (♀), femur 3.93–4.23 (♂), 3.60–4.03 (♀), patella 2.93–3.06 (♂), 2.65–2.83 (♀), chela (with pedicel) 3.85–4.00 (♂), 3.50–3.93 (♀), chela (without pedicel) 3.65–3.83 (♂), 3.33–3.75 (♀), hand 1.63–1.68 (♂), 1.48–1.69 (♀) x longer than broad, movable finger 1.26–1.36 (♂), 1.20–1.26 (♀) x longer than hand. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 27E): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 27E). Chelal hand without microsetae near *eb* and *esb* (Fig. 27E). Chelal teeth juxtadentate, fixed finger with 31 (♂, ♀) triangular teeth (Fig. 27F); movable finger with 24 (♂, ♀) very low, obsolete teeth.

Carapace (Fig. 27A): 1.08–1.12 (♂), 0.85–1.02 (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with small epistome; with 26 (♂, ♀) setae, including 6 near the anterior margin and 4 near the posterior margin; without furrows.

Coxal region (Fig. 23A): manducatory process with 2 long apical setae, plus 7 (♂), 6 (♀) additional setae; chaetotaxy of coxae I–IV: ♂, 6: 8: 7: 9; ♀, 7: 8: 9: 10.

Legs (Fig. 27G): femur + patella 2.45 (♂), 2.80 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 27H); arolium undivided, shorter than claws, bearing a ventral hooked process (Fig. 27H).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 4: 4: 8: 11: 10: 13: 12: 12: 10 (including 4 tactile setae): 9 (including 4 tactile setae): 2; ♀, 4: 4: 8: 11: 11: 12: 13: 13: 12 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 13: (1) 12 [3 + 3] (1): (1) 13 (1): 10: 14: 15: 15: 16: 13 (including 4 tactile setae): 8 (including 4 tactile setae): 2; ♀, 11: (1) 6 (1): (1) 11 (1): 13: 15: 16: 16: 18: 15 (including 4 tactile setae): 9 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate (Fig. 23B).

Genitalia: male with median genital sac deeply bipartite; female with large gonosac covered with pores.

Dimensions (mm): males: lectotype followed by 2 other males (when measured): Body length 1.51 (1.51–1.82). *Pedipalp*: trochanter 0.25/0.12 (0.19–0.245/0.105–0.125), femur 0.59/0.15 (0.565–0.635/0.14–0.15), patella 0.465/0.155 (0.41–0.475/0.14–0.155), chela (with pedicel) 1.00/0.25 (0.915–1.00/0.23–0.26), chela (without pedicel) 0.95 (0.88–0.95), hand length 0.42 (0.375–0.425), movable finger length 0.565 (0.51–0.535). Chelicera 0.20/0.135, movable finger length 0.175. Carapace 0.50/0.445 (0.465/0.43); eye diameter 0.04. Leg I: femur ? (0.285/0.085), patella ? (0.175/0.075), tibia ?, metatarsus ?, tarsus ?. Leg IV: femur + patella ? (0.47/0.185), tibia ? (0.315/0.08), metatarsus ? (0.18/0.065), tarsus ? (0.28/0.045).

Females: paralectotype followed by 2 other females (when measured): Body length 2.14 (1.63–1.77). *Pedipalp*: trochanter 0.26/0.13 (0.30–0.31/0.13–0.135), femur 0.64/0.17 (0.63–0.685/0.17–0.175), patella 0.48/0.17 (0.45–0.495/0.17–0.175), chela

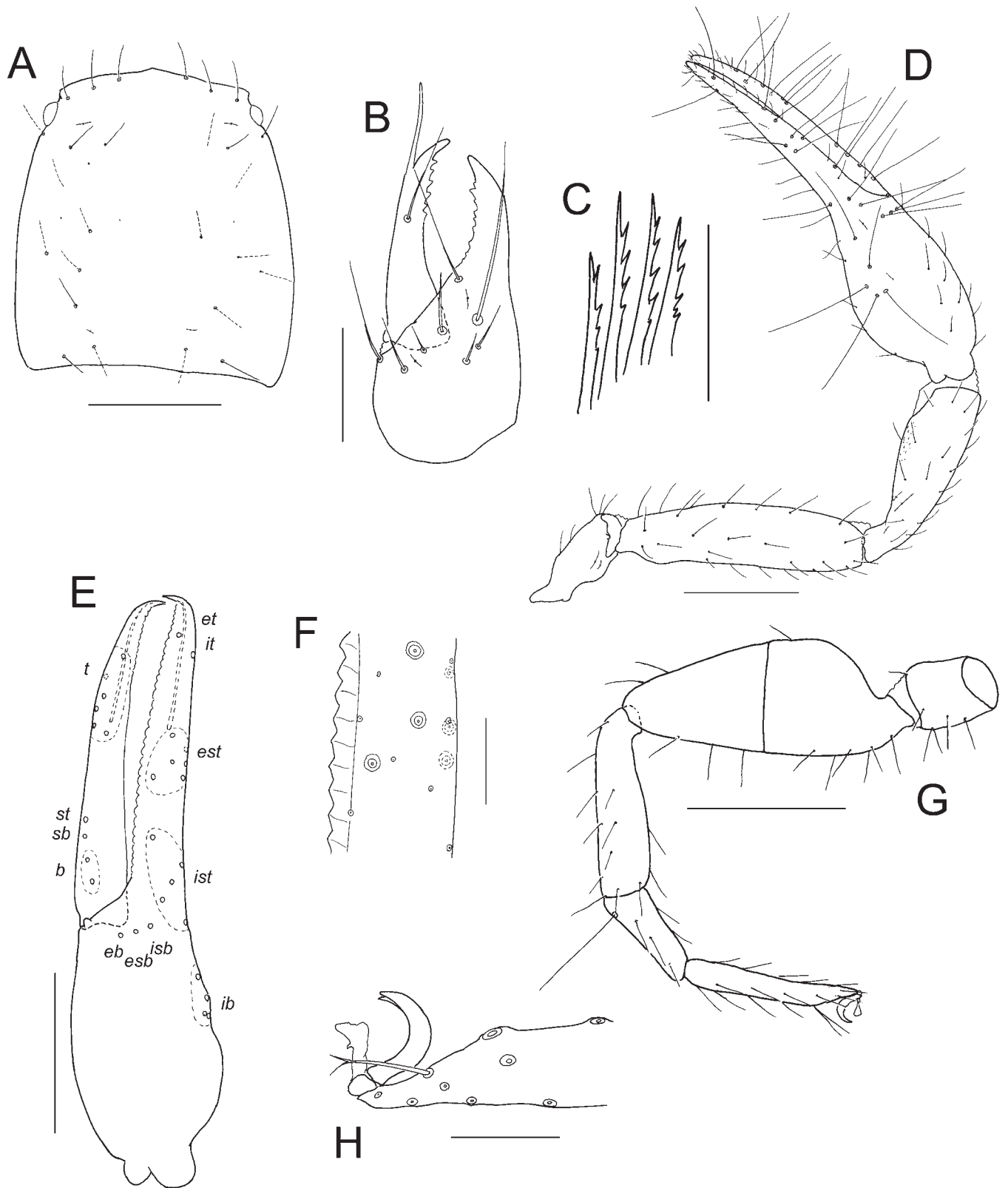


Figure 27.—*Sironcus siamensis* (With), male from Ko Chang, Thailand (MHNG), unless stated otherwise: A. Carapace; B. Left chelicera; C. Rallum; D. Right pedipalp, dorsal; E. Left chela, lateral; F. Detail of fixed chelal finger; G. Leg IV; H. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (D, E, G); 0.2 mm (A); 0.1 mm (B); 0.05 mm (F, C, H).

(with pedicel) 1.12/0.32 (1.11–1.16/0.295–0.30), chela (without pedicel) 1.065 (1.065–1.105), hand length 0.475 (0.47–0.50), movable finger length 0.585 (0.59–0.60). Chelicera 0.33/0.155, movable finger length 0.215. Carapace 0.56/0.55 (0.48–0.50/0.50–0.565); eye diameter 0.05. Leg I: femur 0.305/0.09, patella 0.18/0.09, tibia 0.215/0.065, metatarsus 0.16/0.05, tarsus 0.20/0.04. Leg IV: femur + patella ? (0.56/0.20), tibia ? (0.385/0.09), metatarsus ? (0.21/0.07), tarsus ? (0.315/0.05).

Remarks.—With (1906) described *Ideobisium* (*Ideoroncus*) *siamensis* from five adult specimens, including a female and two males from Koh Chang, and two males from Klong Salakpet. One male and one female from Koh Chang, and one male from Klong Salakpet have been examined for this study. Other slide-mounted material in ZMC was not examined due to its extreme fragility (Dr. H. Enghoff, in litt.), and one male is also lodged in the Natural History Museum, London (Judson 1997) but not examined for this study. As With (1906) did not designate a holotype for this species, a male lectotype has been selected here to stabilize the type locality. The types that have been examined are bleached, but otherwise in good condition. Legs I and IV and the right pedipalp of the male from Klong Salakpet were mounted on a microscope slide by J.C. Chamberlin. The carapace and chelicerae of this specimen have been dissected from the specimen (presumably by With), but are missing from the vial. The measurements of this species provided by With (1906) and Beier (1932b) are at variance with those given here [e.g., pedipalpal femur length 0.70 (♂), 0.75 (♀) mm according to With; 0.70 mm according to Beier, but 0.63–0.635 (♂), 0.64 (♀) in this study], which is presumed to be due to differences in measurement technique.

Schawaller (1994) identified several specimens from Thailand as *D. siamensis* but based on their distribution, some most likely represent other species. In his illustration of the chelal trichobothrial pattern, Schawaller (1994, fig. 33) depicts 20 trichobothria on the fixed finger and hand, and 12 on the movable finger. This is slightly inaccurate, as no specimens of *Sironcus* examined for this study have such a pattern. Therefore, the only confirmed localities from which *S. siamensis* has been recorded are in Koh Chang, southern Thailand (Fig. 22).

***Sironcus sierwaldae* sp. nov.**

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:820F9A91-78FD-4856-9F8C-922B1B777BBD>
(Fig. 28)

Dhanus siamensis (With): Kusch, 1982:66, fig. 2 (misidentification).

Material examined.—*Holotype male*. THAILAND: *Kanchanaburi Province*: Sai Yok National Park, near Headquarters [14°26'N, 98°51'E], 120 m, 14 November 2000, P. Schwendinger (MHNG).

Paratypes. THAILAND: *Kanchanaburi Province*: 1 ♀, collected with holotype (MHNG); 1 ♀, Tham Kung Lawa (= Tham Kaeng Lawa) [14°17'59"N, 98°58'58"E], 155 m, 11 April 1978, [H.] Kusch (NHMW). MYANMAR: *Magway Region*: 1 ♀, Shwesettaw Wildlife Reservation, 20°05'51.1"N, 94°33'24.5"E, 450 feet, 29 September 2003, deciduous forest, P. Sierwald (FMNH).

Diagnosis.—*Sironcus sierwaldae* differs from other species of the genus, except *S. stonei*, by the finely granulate prolateral faces of the pedipalpal femur and tibia (Fig. 28B). It differs from *S. stonei* by the less slender pedipalpal segments, e.g., patella 2.55 (♂), 2.79–2.89 (♀) x in *S. sierwaldae* and 3.45 (♂), 3.39 (♀) x longer than broad in *S. stonei*.

Description (adult).—*Color*: pedipalps and carapace red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera: with 7 (♂, ♀) setae on hand; movable finger with 1 seta; galea very slender and elongate; fixed finger with 7 (♂, ♀) small teeth; movable finger with 6 (♂), 8 (♀) small teeth; rallum of 4 blades, all blades serrate; lamina exterior absent.

Pedipalp (Fig. 28B): femur and patella lightly granulate on prolateral surface, remaining segments smooth; trochanter 2.29 (♂), 2.19–2.41 (♀), femur 3.69 (♂), 3.81–4.12 (♀), patella 2.55 (♂), 2.79–3.15 (♀), chela (with pedicel) 4.14 (♂), 3.58–3.98 (♀), chela (without pedicel) 3.76 (♂), 3.40–3.78 (♀), hand 2.25 (♂), 1.45–1.61 (♀) x longer than broad, movable finger 1.47 (♂), 1.37–1.40 (♀) x longer than hand. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 28C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 28C). Chelal hand without microsetae near *eb* and *esb* (Fig. 28C). Chelal teeth juxtadentate, fixed finger with 34 (♂), 36 (♀) low, triangular teeth (Fig. 28D); movable finger with ca. 25 (♂), 27 (♀) teeth, but only the distal 8 or so with distinct crowns.

Carapace (Fig. 28A): 0.90 (♂), 0.66 (♀) x longer than broad; lateral margins convex; with 2 bulging eyes; epistome absent; with 27 (♂), 25 (♀) setae, including 6 near anterior margin and 4 near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 8 (♂, ♀) additional setae; chaetotaxy of coxae I–IV: ♂, 7: 7: 8: 9; ♀, 8: 7: 7: 11.

Legs: femur + patella 2.32 (♂), 2.64 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 28E); arolium undivided, shorter than claws, bearing a ventral hooked process (Fig. 28E).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 4: 4: 8: 11: 11: 13: 14: 14: 13: 10 (including 4 tactile setae): 6 (including 4 tactile setae): 2; ♀, 4: 4: 8: 9: 10: 12: 13: 14: 14: 12 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 11: (1) 10 [3 + 3] (1): (1) 8 (1): 16: 17: 18: 18: 19: 17: 8 (including 2 tactile setae): 2; ♀, 9: (1) 6 (1): (1) 8 (1): 15: 16: 17: 16: 17: 16: 7 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac bifurcate; female with large gonosac covered with pores.

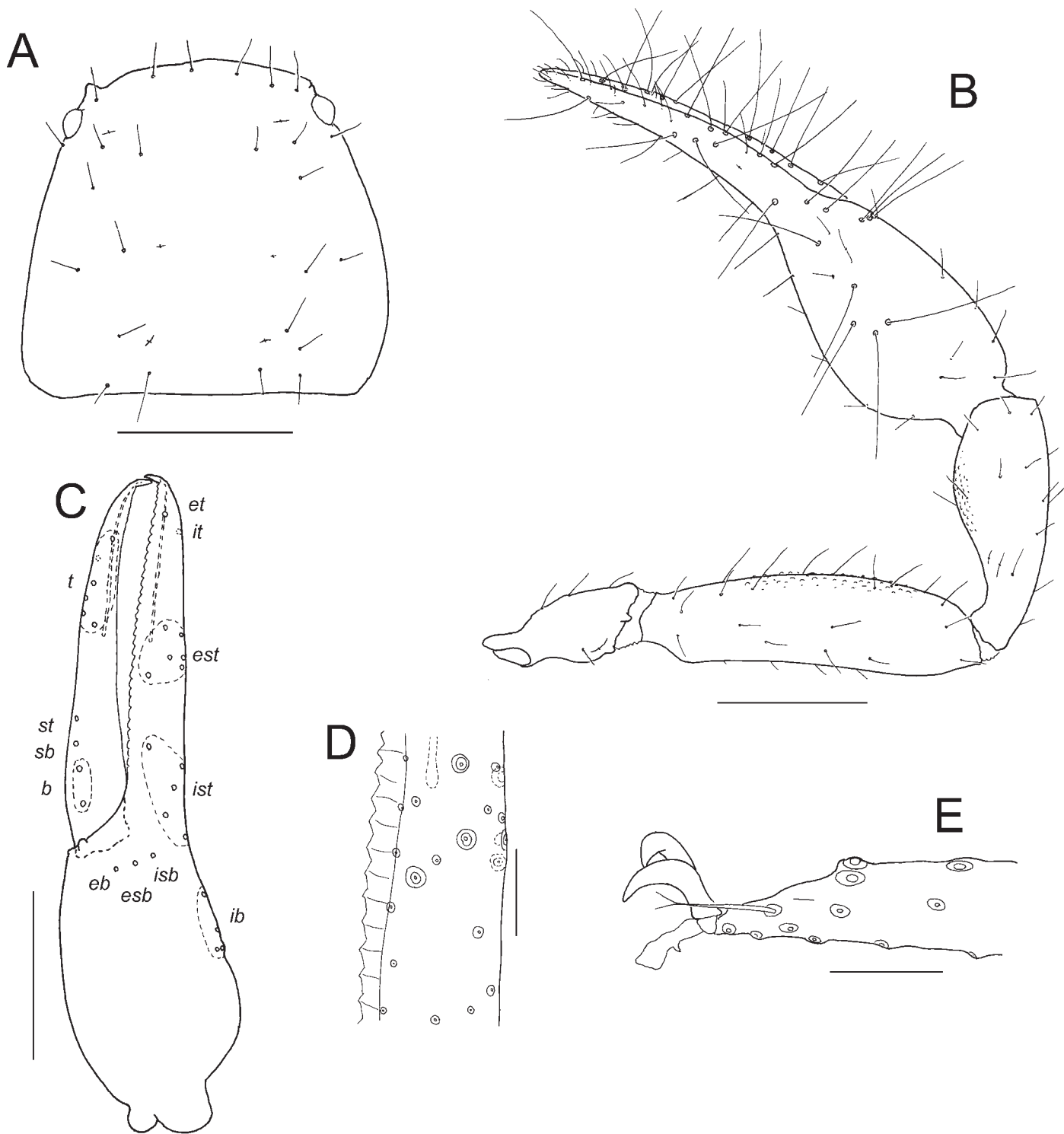


Figure 28.—*Sironcus sierwaldae* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A–C); 0.05 mm (D, E).

Dimensions (mm): male: holotype: Body length 1.59. *Pedipalp*: trochanter 0.275/0.12, femur 0.59/0.16, patella 0.42/0.165, chela (with pedicel) 1.005/0.255, chela (without pedicel) 0.96, hand length 0.39, movable finger length 0.575. *Chelicera* 0.28/0.135, movable finger length 0.185.

Carapace 0.47/0.52; eye diameter 0.05. *Leg I*: femur 0.32/0.085, patella 0.18/0.08, tibia 0.205/0.055, metatarsus 0.15/0.05, tarsus 0.24/0.04. *Leg IV*: femur + patella 0.51/0.22, tibia 0.34/0.09, metatarsus 0.205/0.065, tarsus 0.29/0.045.

Females: paratype from Sai Yok National Park followed by other female (when measured): Body length 1.87 (2.06–2.13). *Pedipalp*: trochanter 0.325/0.135 (0.285–0.31/0.12–0.13), femur 0.695/0.18 (0.61–0.64/0.155–0.16), patella 0.52/0.18 (0.46–0.505/0.16–0.165), chela (with pedicel) 1.165/0.325 (1.05–1.075/0.27–0.285), chela (without pedicel) 1.105 (0.985–1.02), hand length 0.47 (0.435), movable finger length 0.66 (0.595–0.605). Chelicera 0.34/0.17, movable finger length 0.225. Carapace 0.385/0.58; eye diameter 0.05. Leg I: femur 0.37/0.095, patella 0.185/0.09, tibia 0.225/0.065, metatarsus 0.155/0.055, tarsus 0.23/0.04. Leg IV: femur + patella 0.58/0.22, tibia 0.395/0.095, metatarsus 0.23/0.07, tarsus 0.345/0.05.

Remarks.—*Sironcus sierwaldae* has been found in rainforest habitats in western Thailand (Kanchanaburi Province) and south-western Myanmar (Magway Region) (Fig. 22). The female specimen from Tham Kung Lawa was identified by Max Beier as *Dhanus siamensis* and listed by Kusch (1982).

Etymology.—This species is named for the collector of one of the paratypes, Petra Sierwald.

Sironcus stonei sp. nov.

<http://zoobank.org/NomenclaturalActs/urn:lsid:zoobank.org:act:7520A67D-6B74-433B-BCAE-7B614D2B07E9>
(Fig. 29)

Material examined.—*Holotype male*. THAILAND: *Ratchaburi Province*: Amphoe Chom Bung, Tham Chom Phon (label uses the alternative term “Tham Chom Phol”) [13°37'N, 99°35'E], 25 August 1981, F.D. Stone (BPBM, WM6120.01002).

Paratypes. THAILAND: *Ratchaburi Province*: 1 ♀, 1 tritonymph, collected with holotype (BPBM, WM6120.01002–3).

Diagnosis.—The pedipalpal segments of *Sironcus stonei* are slightly more elongated than those of other species of *Sironcus* (Fig. 29B), especially the patella which is 3.45 (♂), 3.39 (♀) x longer than broad, but is 2.69–3.08 (♂), 2.47–2.97 (♀) in the other species.

Description (adult).—*Color*: pedipalps and carapace red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight or slightly curved, and acicular.

Chelicera: with 7 (♂), 6–7 (♀) setae on hand; movable finger with 1 seta; galea very slender and elongate; fixed finger with 8 (♂), 9 (♀) teeth; movable finger with 4 (♂), 6 (♀) small teeth; rallum of 4 blades, all blades serrate; lamina exterior absent.

Pedipalp (Fig. 29B): femur and patella lightly granulate on prolateral surface, remaining segments smooth; trochanter 2.32 (♂, ♀), femur 4.31 (♂), 4.44 (♀), patella 3.45 (♂), 3.39 (♀), chela (with pedicel) 4.30 (♂), 4.12 (♀), chela (without pedicel) 4.11 (♂), 4.12 (♀), hand 1.67 (♂), 1.62 (♀) x longer than broad, movable finger 1.49 (♂, ♀) x longer than hand. Fixed chelal finger with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 29C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *et*, *isb* and *it* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6

trichobothria. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger (Fig. 29C). Chelal hand without microsetae near *eb* and *esb* (Fig. 29C). Chelal teeth juxtadentate, fixed finger with 38 (♂), 40 (♀) low, triangular teeth with the highest point in the distal half (Fig. 29D); movable finger with ca. 30 (♂), 32 (♀) teeth, but only the distal 10 or so with distinct crowns.

Carapace (Fig. 29A): 1.13 (♂), ? (♀) x longer than broad; lateral margins slightly convex; with 2 bulging eyes; with small epistome; with 24 (♂, ♀) setae, including 6 near anterior margin and 4 near posterior margin; without furrows.

Coxal region: manducatory process with 2 long apical setae, plus 7 (♂, ♀) additional setae; chaetotaxy of coxae I–IV: ♂, 5: 7: 6: 8; ♀, 6: 7: 6: 8.

Legs: femur + patella 2.36 (♂), 2.72 (♀) x longer than deep; subterminal tarsal setae bifurcate (Fig. 29F); arolium undivided, shorter than claws, bearing a ventral hooked process (Fig. 29F).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: ♂, 4: 4: 7: 9: 9: 9: 10: 9: 10: 9 (including 4 tactile setae): 10 (including 2 tactile setae): 2; ♀, 4: 5: 7: 9: 9: 11: 10: 11: 13: 10 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: ♂, 11: (1) 9 [3 + 2] (1): (1) 6 (1): 9: 10: 11: 14: 12: 12 (including 2 tactile setae): 6 (including 2 tactile setae): 2; ♀, 11: (1) 7 (1): (1) 6 (1): 12: 14: 12: 12: 11: 6 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with median genital sac not visible in slide preparation; female with large gonosac covered with pores.

Dimensions (mm): male: holotype: Body length ? (damaged). *Pedipalp*: trochanter 0.325/0.14, femur 0.755/0.175, patella 0.57/0.165, chela (with pedicel) 1.225/0.285, chela (without pedicel) 1.17, hand length 0.475, movable finger length 0.71. Chelicera 0.305/0.145, movable finger length 0.195. Carapace 0.565/0.50; eye diameter 0.05. Leg I: femur 0.365/0.095, patella 0.19/0.085, tibia 0.23/0.065, metatarsus 0.16/0.055, tarsus 0.225/0.05. Leg IV: femur + patella 0.59/0.25, tibia 0.40/0.095, metatarsus 0.225/0.065, tarsus 0.345/0.05.

Female: paratype: Body length ca. 2.42. *Pedipalp*: trochanter 0.36/0.155, femur 0.865/0.195, patella 0.61/0.18, chela (with pedicel) 1.34/0.325, chela (without pedicel) 1.28, hand length 0.525, movable finger length 0.78. Chelicera 0.27/0.175, movable finger length 0.225. Carapace 0.57/? (flattened); eye diameter 0.04. Leg I: femur 0.415/0.10, patella 0.21/0.09, tibia 0.28/0.06, metatarsus 0.185/0.055, tarsus 0.25/0.04. Leg IV: femur + patella 0.64/0.235, tibia 0.45/0.10, metatarsus 0.245/0.085, tarsus 0.37/0.065.

Description (tritonymph).—*Chelicera*: galea long and slender, slightly curved; with 6 setae on hand; 1 on movable finger; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.33, femur 4.30, patella 2.85, chela (with pedicel) 4.21, chela (without pedicel) 4.00, hand 1.60 x longer than broad; movable finger 1.51 x longer than hand (without pedicel). Fixed chelal finger with 16 trichobothria, movable chelal finger with 8 trichobothria (Fig. 29E); *isb* and *sb* absent; *eb*, *esb*, *et* and *it* regions each with 1 trichobothrium; *eb* and *esb* at base of finger; *ib* region with 4 trichobothria; *ist* region with 4 trichobothria; *est* region with 3 trichobothria; *et*

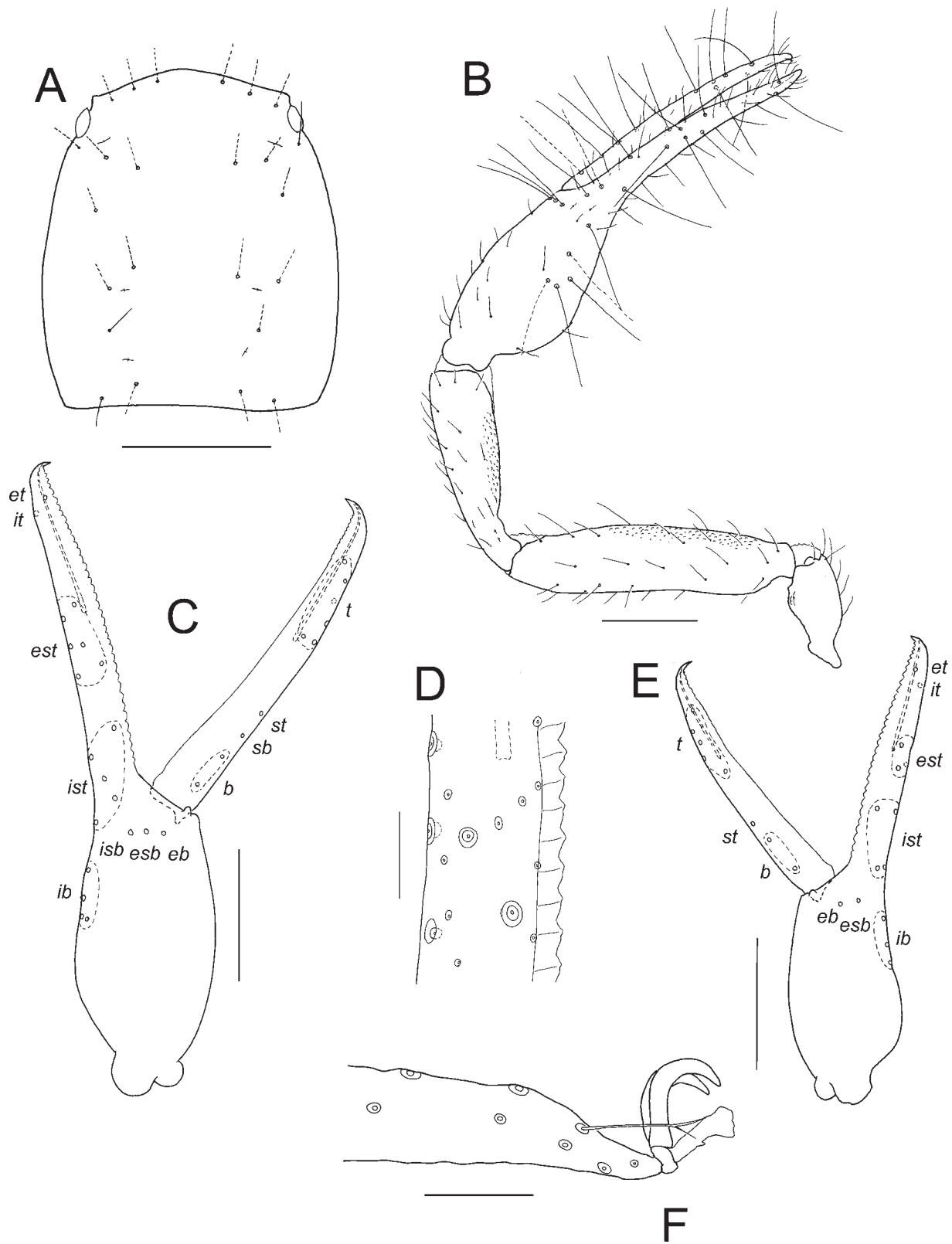


Figure 29.—*Sironcus stonei* sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Left pedipalp, dorsal; C. Right chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph paratype; F. Distal end of tarsus IV showing arolium, claws and subterminal seta, other setae omitted. Scale lines = 0.25 mm (A–C, E); 0.1 mm (D); 0.05 mm (F).

slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: anterior margin slightly medially prominent; with 2 small bulging eyes; with 19 setae including 5 setae near anterior margin and 4 near posterior margin.

Legs: much as in adult.

Dimensions (mm): Body length ? (damaged). **Pedipalp:** trochanter 0.245/0.105, femur 0.58/0.135, patella 0.385/0.135, chela (with pedicel) 0.905/0.215, chela (without pedicel) 0.86, hand length 0.345, movable finger length 0.52. **Carapace** 0.435/0.445.

Remarks.—*Sironcus stonei* has been found inside Tham Chom Phon, a cave set in a small limestone hill on the western outskirts of Chom Bueng.

Etymology.—This species is named for the collector of the type specimens, Fred Stone.

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