

Dolichopodidae (Diptera) from Papua New Guinea IX:
Mischopyga gen. nov. and *Physopyga* gen. nov.,
two new genera from the mangrove in Papua New Guinea*

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ABSTRACT: The new genera *Mischopyga* gen. nov. with *M. artificies* as type and *Physopyga* with *Ph. miranda* as type are described from the mangrove in Papua New Guinea. *Mischopyga* resembles superficially the Diaphorinae but differs from its representatives by the stalked hypopygium. *Physopyga* is placed in the Rhaphiinae.

RESUME: Les nouveaux genres *Mischopyga* et *Physopyga*, avec respectivement *M. artificies* et *Ph. miranda* comme espèce-type, sont décrits des mangroves de Papouasie Nouvelle-Guinée. Le genre *Mischopyga* a des affinités avec la sous-famille des Diaphorinae mais en diffère par son hypopyge pédonculé. Le genre *Physopyga* est placé dans les Rhaphiinae.

1. INTRODUCTION

The study of the dolichopodid fauna of the beach and the mangrove of Motupore Island and Bogoro Inlet, reveals the presence of several Hydrophorine species and a number of new genera that are difficult to place in any of the existing subfamilies (Grootaert & Meuffels, 1988; Meuffels & Grootaert, 1989). The genus *Thinophilus* was quite widespread and present on the mud flats in and out of the mangrove. *Thinolestris luteola*, a small yellow species of Hydrophorinae was found in great numbers between the pebbles on the rocky part of the beach. Unlike *Thinolestris luteola*, a still undescribed *Cymatopus* species had a larger area of activity. It was also present on the mud flat exposed to the sun. Several species belonging to the recently described genus *Phacaspis* (Meuffels & Grootaert, 1989) were only found on the mudflats in the mangrove, generally hunting near the waterfront. The larger Sciapodinae were frequently observed on the leaves of the mangrove trees but apparently they did not come down on

the mud. Curiously enough, *Teuchophorus* and *Sympycnus* species, which were very abundant in the mangrove of North Papua New Guinea (Meuffels & Grootaert, 1986; Meuffels & Grootaert, 1987) were quite rare here in the South. In the North we sampled only brackish water mangroves, so it is possible that these genera cannot stand high saline conditions. Further an unidentified *Cryptophleps* species and several *Diaphorus* species were observed.

In the present paper, another two new genera are described which were found associated with the mangrove. *Mischopyga artifices* gen. nov. sp. nov. was swept from mangrove trees on Motupore Island while *Physopyga miranda* gen. nov. sp. nov. was found on the mudflats along the creek, Bogoro inlet.

2. MATERIAL

The material described in the present paper was collected by the first author during a stay at the biological station on Motupore Island (University of Papua New Guinea) from 9 to 23rd September 1987. This period is near the end of the dry season. Motupore Island is a small island at about 2 km outside the coast in Bootless Bay while Bogoro inlet is a creek that debouches in Bootless Bay. The area is situated at about 20 km southeast of Port Moresby, capital of Papua New Guinea.

The material is preserved in alcohol in the collections of the 'Koninklijk Belgisch Instituut voor Natuurwetenschappen' in Brussels.

3. SYSTEMATIC PART

Mischopyga gen.n.

Mischopyga gen.n. Dolichopodidarum, incertae sedis (gender: feminine).
Derivatio nominis: Greek: 'with stalked hypopygium'.

Species of moderately large stature, with a stalked hypopygium; no flattened posterior area on mesonotum; acr biseriata; femur III without a real preapical bristle; coxae III with an exterior bristle, first joint of tarsus III much shorter than second joint. Antenna short, with dorsal arista.

Male

Head. Frons moderately broad (at level of ocellar triangle about a third of width of head). Face very narrow, without transverse suture. Palpi and rostrum very short; palpi haired, with a very small bristle. Eyes shortly haired, without enlarged facets. Occiput slightly convex. Chaetotaxy: 2 ocellars, 2 verticals, 2 minute postocellars, 2 short postverticals, in row with the postocular cilia but somewhat stronger, however shorter than adjacent postocular cilia. Postocular cilia uniseriate above and laterally, pluriseriate and longer below.

Antennae short; first joint bare; second joint somewhat encompassing at

middle (exteriorly) the third joint, bearing short apical bristles that are longest dorsally. Third joint somewhat triangular with rounded basal angles and a very blunt apex, deeper than long. Arista inserted dorsally; first arista joint very short and thick, looking like a tubercle arising from dorsal margin of third antennal joint, wider than long; second arista joint thin, shortly pubescent.

Thorax without flattened posterior area, only shallowly sunken just in front of scutellum. Acr short, biseriata, running backwards unto level of fourth pair of dc; 5 dc; humeri with 1 bristle and a small hair. Propleurae with 1 bristle and some hairs; prothorax also with 1 bristle and some short hairs. Scutellum with 2 large and 2 small marginals.

Legs without ornamentation, feebly bristled. Coxae II and III with an exterior bristle. Femur II with a downwards pointing rather anteroventral preapical; femur III without a real preapical. First joint of tarsus III much shorter than second joint. Tarsi with very small pulvilli.

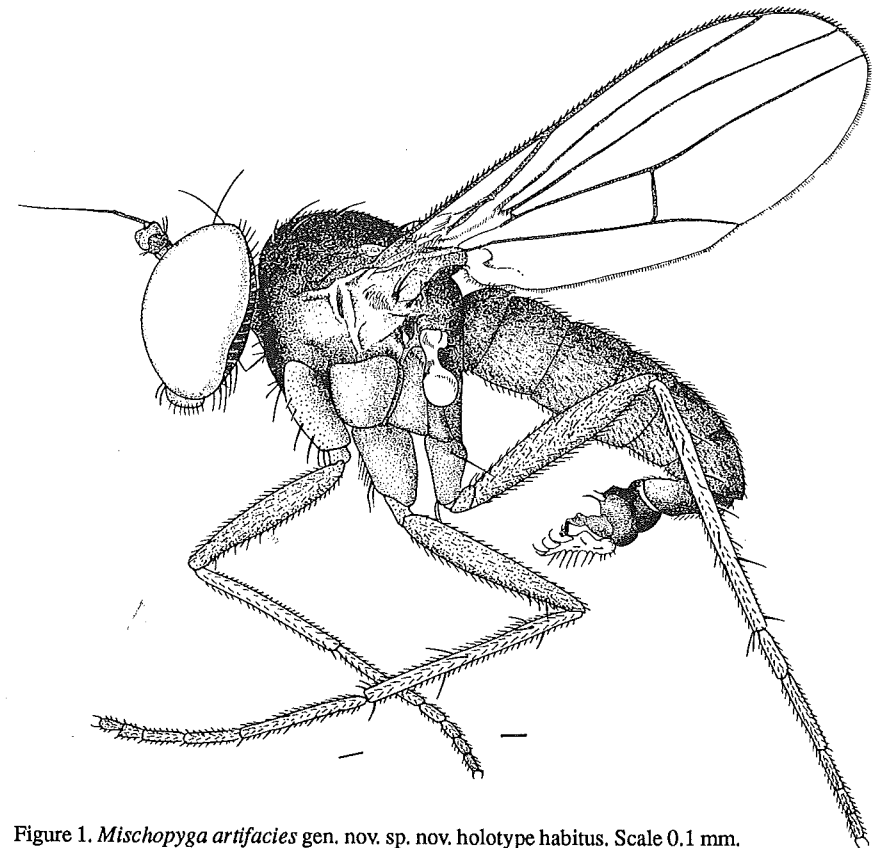


Figure 1. *Mischopyga artifices* gen. nov. sp. nov. holotype habitus. Scale 0.1 mm.

Wings clear, rather narrow. r1 and r2+3 diverging; r2+3 and m1+2 parallel apically. Tp straight, a little shorter than apical part of m3+4. No anal vein.

Abdomen with 6 normal segments; seventh segment forms a stalk to hypopygium. Marginal bristles of tergites short, hardly longer than the hairs. Hypopygium stalked.

Type species: *Mischopyga artificias* sp. nov. male.

***Mischopyga artificias* sp. nov.** Figs. 1-4. Derivatio nominis: (Lat.) 'With narrow face'.

Male

Body length: 3 mm; wing length: 2.6 mm.

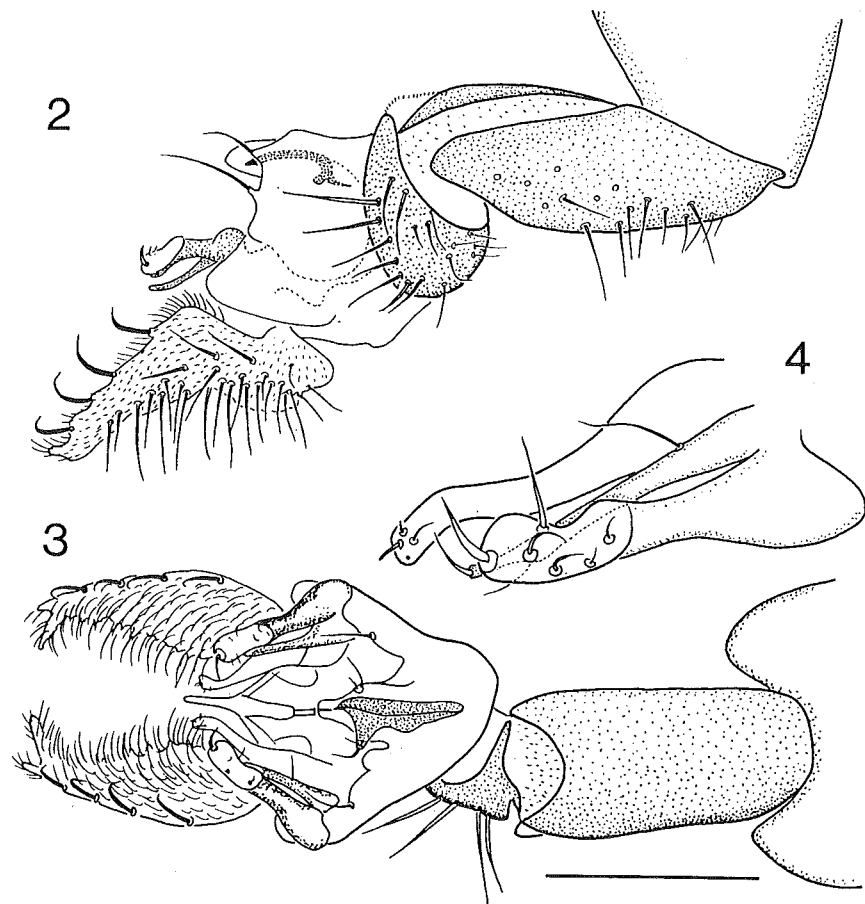


Figure 2-4. *Mischopyga artificias* gen. nov. sp. nov. holotype male terminalia. 2 side view; 3 ventral view; 4 detail of telomeres. Scale 0.1 mm.

Head. Frons and face with moderately shining dark green metallic ground colour; eyes nearly touching each other on middle of face. Palpi dark brown with brownish hairs and a very short black bristle. Rostrum brown. All postocular cilia yellowish. *Antennae* dark brown, third joint pubescent, shaped as described under the genus.

Thorax. Mesonotum and scutellum with shining dark metallic green ground colour; pleurae with moderately shining blackish brown, partly dark metallic green ground colour. Acr biseriate, short; 5 dc. All bristles black.

Legs. Coxae, trochanters and femora dark brown; apical fifth of femur I yellow. Tibiae and basal joints of tarsi yellow; tarsi dark from tip of basal joints onwards.

Coxa I with black hairs and an irregular vertical row of black bristles; at apex a few weaker bristles. Trochanter I bare. Femur I posteriorly near base with a few short, erect hairlike bristles; posteroventrally on apical half a row of short bristle-like hairs, becoming longer towards tip of femur. Tibia I slightly longer than femur, without bristles or serration; only at tip some very short bristles; posteroventrally at tip a short fringe. Last three joints of tarsus I short. Length ratio of tibia I and tarsus I: 20: 12: 3.5: 2.5: 2: 2.5.

Coxa II with a black exterior bristle, anteriorly haired. Trochanter II ventrally shortly haired. Femur II with a downward pointing anterior (or rather anteroventral) preapical bristle; ventrally the hairs are slightly lengthened, becoming bristle-like on apical fourth. Tibia II longer than femur; 2 ad, 2 pd; 1 anterior bristle near base; 1 ventral bristle beyond middle; a circlet of apical bristles. First four joints of tarsus II with rather strong apicoventral spinules; first joint ventrally with a few short bristles. Length ratio of tibia II and tarsus II: 27: 15: 6: 4.5: 2.5: 2.5.

Coxa III with a black exterior bristle. Trochanter III with a dorsal bristle-like hair and some ventral short hairs. Femur III anteroventrally with slightly lengthened hairs, with an indistinct anteroventral preapical. Tibia III longer than femur; 2 ad, 4 pd of unequal length; a circlet of short apical bristles. Tarsus: first joint much shorter than second joint; first three joints ventrally spinulose. Length ratio of tibia III and tarsus III: 33: 5.5: 10: 5: 2.5: 2.5.

Wings slightly brownish tinged, with brownish yellow veins. Tp 3/5 times as long as apical part of m3+4. Length ratio of basal and apical parts of m1+2: 4: 7. Halteres whitish yellow. Squamulae yellow with a black border and dark brown cilia.

Abdomen with shining dark metallic green ground colour, laterally and ventrally with a brownish hue. Tergites set with short black hairs; marginal bristles hardly longer or stronger than the hairs. Hypopygium stalked, blackish with yellow cerci. Genitalia as in Figs. 2-4. Cerci somewhat triangular, oblong, with a rather acute apex, dorsally with short rigid hairs; at ventral margin some bent bristles.

Female

Unknown.

Material: Holotype male: Papua New Guinea, Motupore Island, 10.IX.1987, caught by sweeping small trees in the mangrove along the island.

Discussion

Using the key to the subfamilies in Robinson (1970), one arrives at the Diaphorinae (fourth wing vein not forked, vertex of head not excavated; third and fourth veins not divergent; first antennal segment bare; posterior crossvein not longer than last section of fifth vein; acrostichal bristles present, abdomen not flattened dorsally; face without median vertical furrow; hind femur without distinct preapical bristle; posterior slope of thorax not flattened; arista dorsal). The stalked, rather large hypopygium however does not fit with the hitherto assumed variation width. Recently, Bickel (1987) described the genus *Kowmungia* from Australia, having also the hypopygium stalked by the seventh abdominal segment. The likeness with *Mischopyga* however is only superficial, for Bickel's genus has e.g. a distinct frontoclypeal suture, an apical arista, posterior fourth of mesonotum distinctly flattened and femur III with a preapical bristle.

Physopyga n.gen.

Physopyga n.gen. in subf. Rhaphiinae (Gender: feminine).

(Derivatio nominis: (Gr.) φυσσων πυγη: 'with inflated hypopygium').

Metallic green coloured species of feeble stature. Head about as high as wide, with small palpi and a short rostrum. Eyes bare, separated in both sexes. Occiput slightly convex. 2 ocellar, 2 vertical and 2 short postvertical bristles. Postocular cilia uniseriate. Antennae inserted well above middle of head; first joint short, bare; third joint elongate; lanceolate, rather pointed, with an apical arista. Mesonotum without flattened posterior slope; acrostichals biseriate, short; 4 (5?) dc. No propleural bristles. Scutellum with 2 marginals. Pleurae bare. Legs of male ornamented; tarsi of all legs short, tarsus I of male with modified pulvilli. Coxae II and III with exterior bristles. Femur III without preapical bristle. First joint of tarsus III longer than second joint. In male, second joints of tarsi II and III shorter than third joints. Costa of wing reaches tip of m1+2. m1+2 bent upwards in its apical part, so as to reach costa near tip of r2+3. Tp shorter than apical part of m3+4. Wing of male narrow, without anal lobe. No real anal vein present. Abdomen cylindrical, longer than thorax. Hypopygium of male of very peculiar shape, with a large, laterally compressed, somewhat inflated capsule and modified, loosely attached cerci.

Typus generis: *Physopyga miranda* n.sp.

Discussion

This genus clearly belongs within the subfamily Rhaphiinae by its elongate third antennal joint with apical arista, bare first antennal joint, not flattened posterior slope of mesonotum, and biseriate acrostichals. Within this subfamily, it stands apart by its peculiarly shaped hypopygium and the absence of dornen on the female oviscapit.

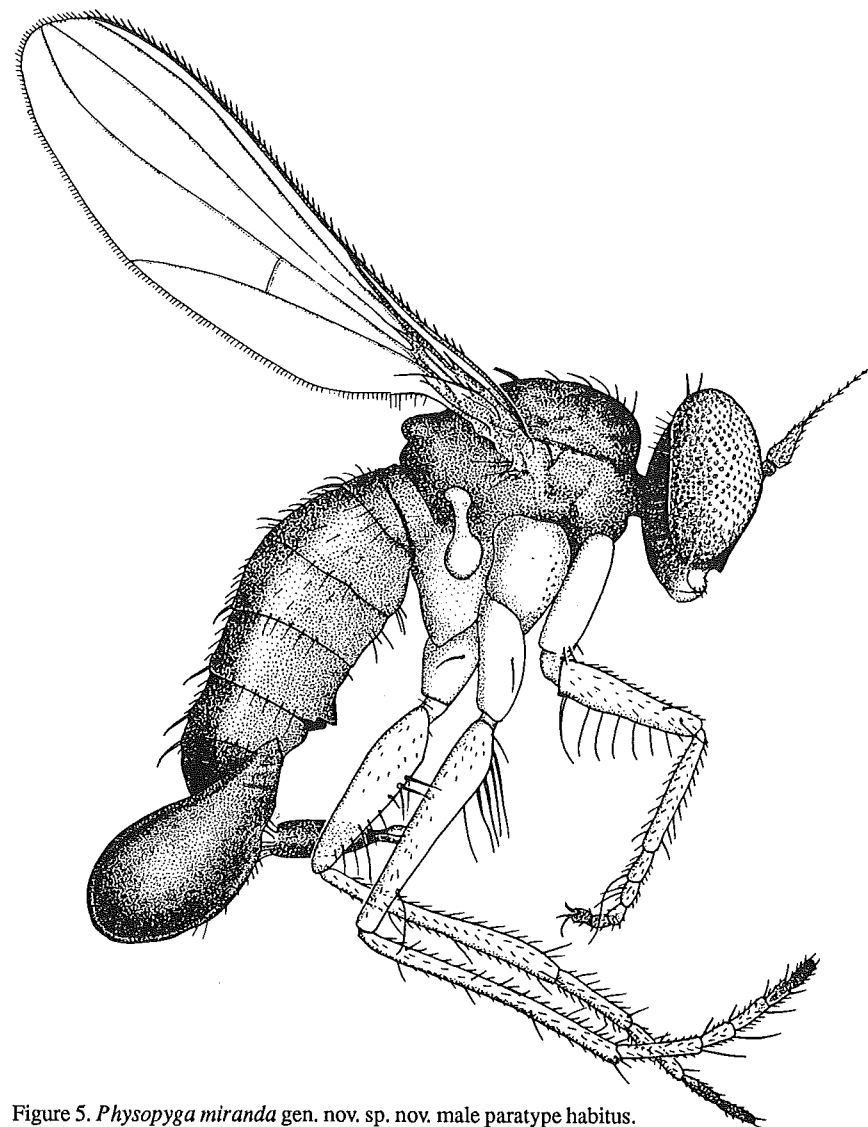


Figure 5. *Physopyga miranda* gen. nov. sp. nov. male paratype habitus.

***Physopyga miranda* sp. nov. Figs. 5-11.**

(Derivatio nominis: Lat. mirandus = wonderful, strange).

A rather small, metallic green coloured Rhapsiine species with lanceolate antennae and typical wing venation. Male with highly ornamented legs and a peculiar hypopygium.

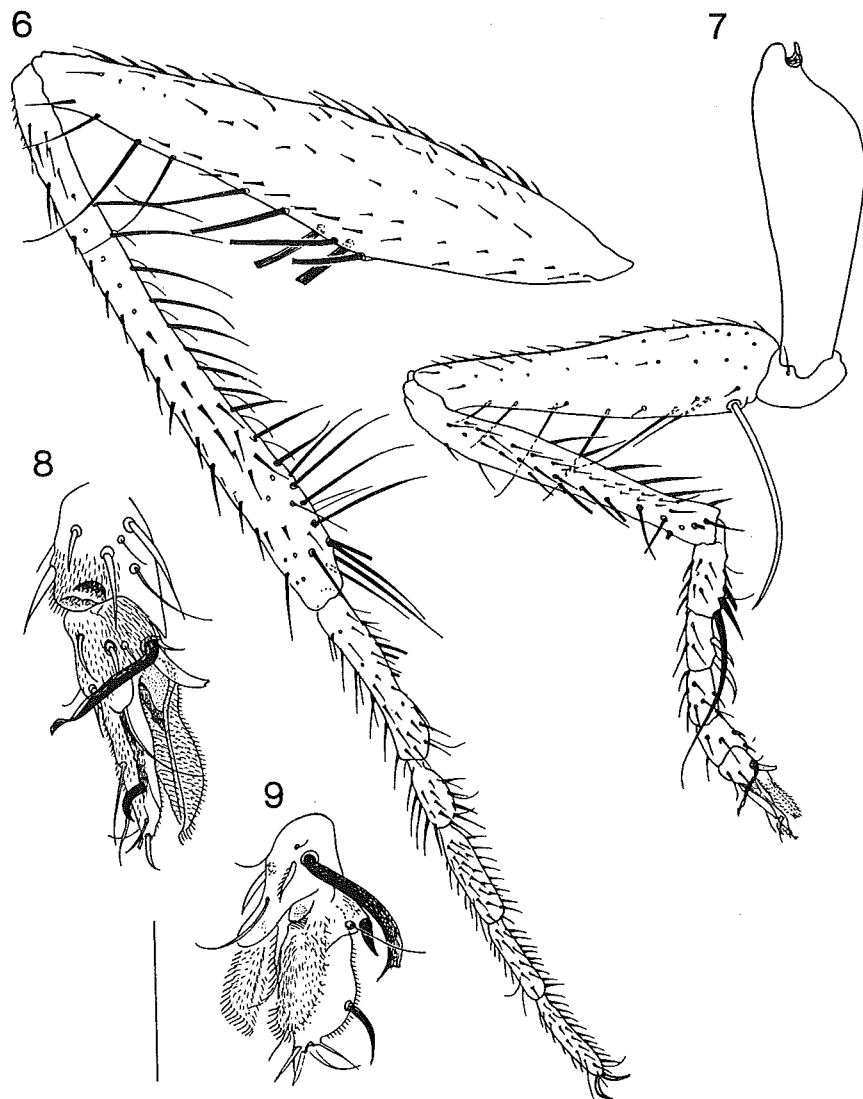
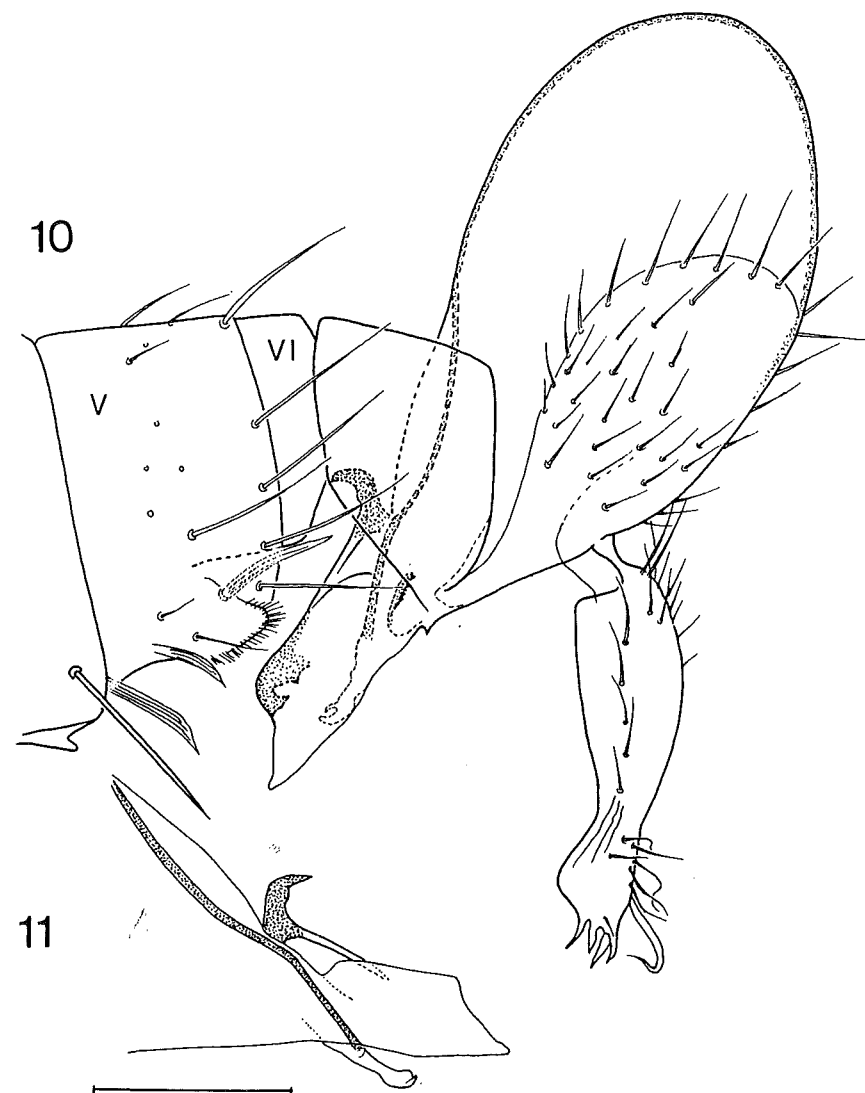


Figure 6-9. *Physopyga miranda* gen. nov. sp. nov. male paratype. 6. hind leg; 7. front leg; 8, 9. detail of terminal tarsal segment of front leg. Scale 0.1 mm.

Male

Body length (without hypopygium) 2.2 mm; wing length 2.2 mm.

Head. Frons with shining metallic green ground colour. Face narrow, with dark brown ground colour (head badly damaged!). Palpi small, yellow, with short black bristly hairs and a short black apical bristle. Rostrum black. Occiput



Figures 10-11. *Physopyga miranda* gen. nov. sp. nov. male paratype. 10. hypopygium; 11. detail of tip of aedeagus and hypandrium. Scale 0.1 mm.

with shining black ground colour. Postocular cilia black above, whitish below. Antennae very slender; first and second joints brownish yellow, second joint with a narrow brown apical border; third joint brown, slightly paler at base. First antennal joint longer than wide; second joint with very short apical bristles; third joint lanceolate, about four times as long as wide, with very short pubescence. Arista apical, about as long as antenna, shortly pubescent; first aristal joint about a quarter of the length of third antennal joint.

Thorax. Mesonotum and scutellum with beautifully shining dark metallic green ground colour, with bronzy, blue and purple reflections. Pleurae shining dark metallic green. ac short, biseriate; 4 (5?) dc, preceded by some hairlets. Scutellum with two marginals, each flanked by a short hair. Propleurae with a few white hairlets.

Legs and coxae pale yellow. Coxa I anteriorly at base brownish; coxa II with a vague dark spot at base. Pulvilli of tarsus I blackish; three last joints of tarsi II and III feebly darkened.

Coxa I anteriorly at apex with about 5 short dark bristles. Trochanter I bare. Femur I (Fig. 7) ventrally at base with a very long, bent, yellow bristle, pointing obliquely in posterior direction; a row of about 6 thin, rigid, hairlike ventral yellow bristles, longest near base (there a little longer than diameter of femur), gradually growing shorter distally; a very small and weak posteroventral preapical bristle. Femur I has hairs only dorsally and anteriorly on apical third, and is further practically bare. Tibia I slightly shorter than femur; anterodorsally a row of short brownish bristles, growing longer distally; anteroventrally a row of 5 short brownish yellow bristles, longest near apex of tibia; at apex a short yellow fringe. Tarsus I (Fig. 8-9) peculiarly ornamented. First joint bearing at ventral apex a very long, bent, yellowish brown bristle, reaching nearly to tip of tarsus, preceded by 2-3 short black, spinelike bristles. Second joint ventrally with two short but strong brown bristles. Third and fourth joints ventrally with a few short spinules. Fifth joint short, but looking longer as a result of the lengthening of its curiously deformed pulvilli, one of which bears at and near apex short bristles of unequal length and strength, including a strong black clawlike preapical bristle. Between the pulvilli a hairlike empodium is visible. Claws seem to be absent, but the fifth tarsal joint bears some modified strong bristles, including a rather long black, somewhat flattened and curled, bristle. Length ratio of tibia I and tarsus I: 9: 2.5: 1.5: 1.5: 1: 1.

Coxa II with a weak exterior bristle. Trochanter II with a strong black, inwardly directed bristle, besides some weak bristles. Femur II rather strongly thickened near base, ventrally on basal third with a row of 6 bristles of varying length and strength; 1 short and weak bristle at very base; the second, third and fifth bristles are long but not very strong; the fourth one is longest and strongest; the last bristle is a little shorter and rather thin. Near tip of femur II an av. Tibia II a little longer than femur. 3 short ad, 3 short av; posteroventrally at middle a rather strong black bristle; from this bristle to tip of tibia a row of slightly shorter

yellowish hairlike bristles; a few short apical bristles. Tarsus II short, with a very short second joint. First joint posteroventrally with a row of pale rigid hairs. First to fourth joints with rather strong apicoventral spinules and dorsally each with an apical bristle, shortest on fourth joint. Length ratio of tibia II and tarsus II: 20: 6.5: 2: 3: 2: 2.5.

Coxa III with a weak black exterior bristle near base. Trochanter III with a small anterodorsal bristle. Femur III thickened, with its greatest depth just in front of middle; from this point towards tip anteroventrally and ventrally a row of rather long bristles, starting just in front of middle of femur with two very strong black bristles; at same level, more posteroventrally, two weaker and shorter bristles. No preapical. Tibia III about as long as femur, slightly swollen ventrally on apical fourth. 3 short pd; posteroventrally a row of rather long pale hairlike bristles on basal half; anteroventrally a row of short hairlike bristles, at most about as long as diameter of tibia. Ventrally on the swollen apical fourth a number of partly black, partly yellowish bristles of varying length and strength, pointing in various directions. A circlet of apical bristles. Tarsus III ventrally rather spinulous, bearing some longer bristles ventrally on first two joints, dorsally with rather long hairs, especially on first two joints. Second joint shortened. Length ratio of tibia III and tarsus III: 17: 6.5: 2.5: 3: 2.5: 3.

Wings slightly brownish tinged. m1+2 first diverging from r2+3, bent upwards in its apical part and ending into costa close to tip of r2+3. Tp straight, much shorter than apical part of m3+4. Anal lobe not developed; anal vein only a fold. Halteres yellow. Squamulae yellow with dark cilia.

Abdomen shining dark metallic green with coppery and blue reflections; sides with a brownish hue, especially so on second and third segments. Hairs and marginal bristles rather short, black. Sternites brownish, with transverse rows of erect black hairs. Fourth and fifth segments ventrally somewhat modified, apically protruding, bearing flattened bristles.

Hypopygium (Fig. 10) of unusual shape, consisting of a large, laterally compressed, slightly inflated capsule, basally with fused hypandrium and telomeres, and rather loosely attached, modified cerci. Tip of aedeagus rounded, hidden between the paired hypandrial extensions (?) of telomeres (Fig. 11).

Female

Body length 2.2-2.3 mm; wing length 2.1 mm.

Head. Face broader than in male, nearly parallel-sided, more than twice as wide as width of third antennal joint. Antenna a little shorter than in the male.

Legs and coxae yellow; coxa I slightly brownish at base; coxa II basally with a brownish streak. Tip of fifth joint of tarsus I and last three joints of tarsi II and III slightly browned. Legs without ornamentations; pulvilli of tarsus I normal.

Coxa I anteriorly with a few scattered brown hairs, apically with some black bristles. Tibia I anterodorsally with an irregular, partly double row of short black bristles. Length ratio of tibia I and tarsus I: 9: 3: 1.5: 1.5: 1: 1.75. Femur II with a

short av near tip. Tibia II with 3 very short dorsal bristles and 1 pv about at middle. Length ratio of tibia II and tarsus II: 17: 6: 2.5: 2.75: 2: 2.5. Tibia III with some short ad and pd; 1 ventral bristle just beyond middle. Length ratio of tibia III and tarsus III: 20: 6: 3: 3: 2: 2.5.

Wings. Anal lobe feebly developed.

Abdomen. Venter yellowish. Oviscapt yellow, without dornen.

Material: Holotype male: Papua New Guinea, Bogoro Inlet (National Capital District), 13.ix.1987, sample no. 0163, leg. P. Grootaert. Paratypes: 2 females + remnants of a male and female, from same origin as holotype.

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