

Notes on taxonomy of *Pygophora* Schiner, 1868 (Diptera: Muscidae)Таксономические заметки по *Pygophora* Schiner, 1868
(Diptera: Muscidae)N.E. Vikhrev
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Зоологический музей, МГУ им. М.В. Ломоносова, Большая Никитская ул., 2, Москва 125009, Россия.KEY WORDS: *Pygophora*, Muscidae, Diptera, taxonomy, new species, new subspecies, new synonym.КЛЮЧЕВЫЕ СЛОВА: *Pygophora*, Muscidae, Diptera, систематика, новый вид, новый подвид, новый синоним.

ABSTRACT. *Pygophora unicolor* is divided into 2 subspecies: nominotypical *P. u. unicolor* Stein, 1920 from Sunda Isl. and *P. u. crosskeyi* **ssp.n.** from S Asian mainland. *P. yanbulat* **sp.n.** is described from New Guinea. Hitherto unknown female of *P. papuana* Vikhrev, 2015 is described. New synonym established: *P. hirtimana* Malloch, 1935 = *P. tarsaseta* Snyder, 1965, **syn.n.**

РЕЗЮМЕ. *Pygophora unicolor* разделена на 2 подвида: номинативный *P. u. unicolor* Stein, 1920, населяющий Зондские острова, и *P. u. crosskeyi* **ssp.n.** из материковой части Южной Азии. Описан новогвинейский вид *P. yanbulat* **sp.n.** Описана ранее неизвестная самка *P. papuana* Vikhrev, 2015. Предложен новый синоним: *P. hirtimana* Malloch, 1935 = *P. tarsaseta* Snyder, 1965, **syn.n.**

Introduction

The Paleotropical genus *Pygophora* Schiner, 1868 is distributed in S Asia, Melanesia, Micronesia, Australia and Africa. It includes 75–80 valid (or so far valid) species. *Pygophora* is a lucky genus among Coenosini because its world fauna was thoroughly revised by Crosskey [1962] who gave a key and redescriptions of 53 species known at that time. However, even species considered by Crosskey [1962] pose many taxonomical problems due to strong intraspecific variability in *Pygophora* and lack of available specimens. I try to publish these data as the collection of the Zoological Museum of Moscow University accumulates material which allows to clarify some questions. In the present paper four species are considered.

P. unicolor was described by Stein in 1920 from female collected on Java. Females of *Pygophora* are problematic for identification, but due to entirely black colour of the body this species seemed unmistakable.

The male of *P. unicolor* was described 88 years later from a single male specimen [Shinonaga, Tewari, 2008]. In ZMUM collection *P. unicolor* is now represented by 7 males from Thailand, 11 males from Malaysian Borneo and series of 26 females originated from India, Goa state in the west to Indonesia, Bali Island in the east. This rich material allowed to specify the taxonomy of *P. unicolor*: to correct serious errors in the description of male [Shinonaga, Tewari, 2008] and to provide a species diagnosis. I also found that *P. unicolor* is represented by two geographic forms which I regard here in taxonomic rank of subspecies: the nominotypical *P. u. unicolor* Stein, 1920 and *P. u. crosskeyi* **ssp.n.** here described.

In 2014 in Baliem Resort's garden (Indonesia, Papua prov., 2000 m asl.) I collected a male of entirely black *Pygophora* which strongly differs from *P. unicolor*. I had not mentioned this specimen in previous paper on *Pygophora* [Vikhrev, 2015] because I hoped to visit Baliem Resort again. I really came back there in December 2017 and this time a series of 14 males and 13 females were collected and described below as *P. yanbulat* **sp.n.**

P. papuana Vikhrev, 2015 is very large and setulose species which lives at extremely high altitude (3350 m asl.). The hitherto unknown female *P. papuana* was found in 2017 and is described here.

It is amusing that all 3 species of *Pygophora* mentioned above have an entirely dark body, so this diagnostic character is not as reliable as we thought.

Material and methods

The majority of the specimens studied are stored in the Zoological Museum of Moscow University (ZMUM), in this case not indicated in text.

Localities are given as follows: country, region, geographical coordinates in the decimal degrees format.

The following generally accepted abbreviations for morphological structures are used: *f1*, *t1*, *f2*, *t2*, *f3*, *t3* = fore-, mid-, hind- femur or tibia respectively; *ac* — acrostichal setae; *dc* — dorsocentral setae; *a*, *p*, *d*, *v* = anterior, posterior, dorsal, ventral seta(e).

Pygophora hirtimana Malloch, 1935

Figs 1–2.

Pygophora hirtimana Malloch, 1935.

Pygophora tarsaseta Snyder, 1965, **syn.n.**

MATERIAL. Nouvelles Hebrides (VANUATU), I. Tanna (19.5°S 169.3°E), A. De la Rue, 1934, 1♂ (Museum national d'Histoire naturelle, Paris, France).

DISTRIBUTION. PNG, Bismarck Archipelago (type locality); Solomon Islands; Japan: Bonin Isl. (27.1°N 142.2°E); Vanuatu (new record). It is mysterious for me how *P. hirtimana* could settle such a remote islands as Bonin and Tanna.

DISCUSSION. Apparently, Snyder [1965] didn't read Crosskey's [1962] revision of *Pygophora*, the first species he described *P. boninensis* Snyder, 1965 is most probably *P. macularis* Wiedemann, 1830. I suspect that the majority of Snyder's species of *Pygophora* are synonyms, but examination of the type material in Bishop Museum is required to be sure. However, *P. tarsaseta* Snyder, 1965 with the intricately modified hind tarsus is no doubt a synonym of *P. hirtimana* Malloch, 1935 as follows from drawings on Figs 1–2 (the bunch of setulae on *tar1*–3 may look longer or shorter depending on angle of view) and as well from descriptions.

Pygophora papuana Vikhrev, 2015

Fig. 3.

Pygophora papuana Vikhrev, 2015.

MATERIAL. Holotype ♂: INDONESIA, *W Papua* prov., Lake Habbema, 3350 m asl, 4.14°S 138.71°E, 26.12.2014, N. Vikhrev. The same locality, 10.12.2017, N. Vikhrev, 1♂, 1♀.

DISTRIBUTION. An endemic of the highlands of New Guinea.

NOTES ON MALE. This species was known from single male holotype [Vikhrev, 2015], the second collected male generally fits well the description, but some points could be specified. Orbital chaetotaxy should be described as follows: apart from typical 2 inclinate and 2 reclinate setae there are 2–3 strong supernumerary inclinate setae and 4–6 additional setulae around inclinate setae (1). Chaetotaxy of *t2* of the holotype was described as “3 strong *pd*”, the second male has 1 *ad* and 3 *pd* on left *t2* and 4 *pd* on right *t2* (2). Additional presutural *dc* seta is unusually strong for *Pygophora*, so it is better to describe *dc* as: 2+3 (3). The type locality was indicated as West Papua Province, actually it is Papua Province of Indonesia (4).

FEMALE (Fig. 3) of this species was unknown. According to examination of the first female specimen collected in 2017, it differs from male as follows: body length larger: 7.7 mm; wings darkened on anterior half only; *t1* with 2 *pv*; *t2* with 4 *pd* and a dense row of 4–5 shorter *ad* setae in middle 1/3; *t3* without apical lobe; shape of abdomen typical for *Pygophora* female, with pointed apex.



Figs 1–3. *Pygophora* spp.: 1 — ♂ hind tarsus, *P. hirtimana*, by Crosskey [1962: 531, fig. 24]; 2 — ♂ hind tarsus, *P. tarsaseta*, by Snyder [1965: 230, fig. 13f]; 3 — ♀ *P. papuana*.

Рис 1–3. *Pygophora* spp.: 1 — ♂ задняя лапка, *P. hirtimana* по Crosskey [1962: 531, fig. 24]; 2 — ♂ задняя лапка, *P. tarsaseta* [по Snyder [1965: 230, fig. 13f]; 3 — ♀ *P. papuana*.

Pygophora unicolor Stein, 1920

REMARKS. In 1920 Paul Stein described a new species of *Pygophora* by single female from Java. Crosskey's [1962] diagnosis of *P. unicolor* was: "distinguished from

all other species yet known by entirely dark ... colour (of body)". When Crosskey [1962] published his revision of the genus, the male of *P. unicolor* was still unknown, while females were recorded also from India (Tamil Nadu



Figs 4–7. *Pygophora* spp.: 4 — ♂ *P. unicolor unicolor* (Borneo); 5 — ♂ *P. unicolor crosskeyi* ssp.n. (Thailand); 6 — ♂ Holotype *P. yanbulat* sp.n.; 7 — ♀ paratype *P. yanbulat* sp.n.

Рис 4–7. *Pygophora* spp.: 4 — ♂ *P. unicolor unicolor* (Борнео); 5 — ♂ *P. unicolor crosskeyi* ssp.n. (Таиланд); 6 — ♂ Голотип *P. yanbulat* sp.n.; 7 — ♀ парагип *P. yanbulat* sp.n.

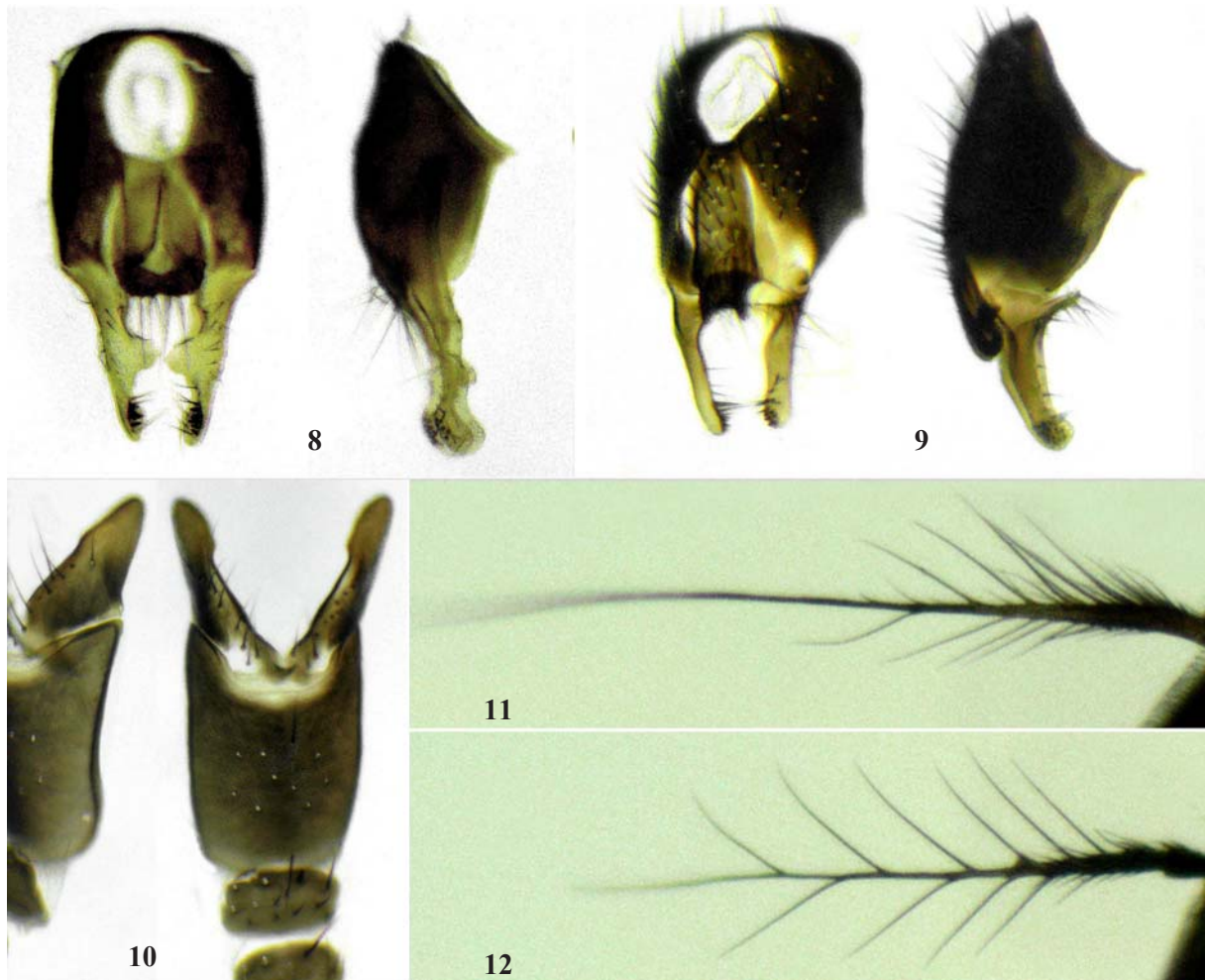
and Karnataka states), Peninsular Malaysia (Pahang state) and Papua New Guinea. A single male of *P. unicolor* was finally found in 1993 again in Tamil Nadu and described [Shinonaga, Tewari, 2008]. In ZMUM collection *P. unicolor* is now represented by 18 males and 26 females. Such a rich material allows to specify the taxonomy of this species.

1. Diagnosis. ♂♀: Small *Pygophora* with entirely black body. Frons not widened, supernumerary inclinate setae absent, arista long plumose in basal part and bare apically. ♀: Typical “*Pygophora*” femoral chaetotaxy: 3 strong and long *pv* setae on basal half of *f2* and *f3* and a complete row of *av* on *f3* of which 2–3 in apical third are long and strong. Postpedicel unmodified. All femora dark in basal 2/3. ♂: The most remarkable character of male *P. unicolor* is the reduced leg chaetotaxy: strong *pv* and *av* setae on *f2* and *f3* described for female are reduced to 1(2) short and fine setulae on each surface, except for 1 medium strong preapical *av* on *f3* (Figs 4–5). Postpedicel long, almost reaching mouth-margin (failing short by about 0.1 of its length). Both calypters are hyaline brown (Figs 4–5).

2. The diagnosis given above quite contradicts the de-

scription of male *P. unicolor* by Shinonaga, Tewari [2008] which in my opinion has significant errors: “upper and lower squama creamy white ... *f2* with 2 long bristles on the middle of *pv* surface ... *f3* with a sparse row of long bristles on *av* surface...”. The most important error is that the most remarkable character of male *P. unicolor*, the reduced femoral chaetotaxy is missing.

3. Examination of our material of *P. unicolor* shows that there are 2 geographical forms which I regard here in the subspecies rank. The nominotypical *P. u. unicolor* Stein, 1920 is represented by larger specimens and males with all femora basally dark. Crosskey [1962] examined the holotype of *P. unicolor* (type locality: Indonesia, Java, Wonosobo (7.35°S 109.90°E, 750 m asl)) and described it as having body length 5 mm and abdomen entirely black. Our specimens from Borneo and Bali belong to the nominotypical subspecies, the geographical reason (Java situating between Bali and Borneo) also confirms it. The South Asian mainland from India to Vietnam is inhabited by a subspecies described below as *P. unicolor crosskeyi* **sp.n.** It has a smaller size and males with mostly or entirely yellow femora.



Figs 8–12. *Pygophora* ssp.: 8 — *P. u. crosskeyi* **ssp.n.**, paralobes of hypopygium ventral and lateral; 9 — *P. yanbulat* **sp.n.**, paralobes of hypopygium ventral and lateral; 10 — *P. yanbulat* **sp.n.**, sternite 5 ventral; 11 — *P. u. unicolor*, ♂ arista; 12 — *P. yanbulat* **sp.n.**, ♂ arista.

Рис 8–12. *Pygophora* ssp.: 8 — *P. u. crosskeyi* **ssp.n.**, парало́бы гипопигиума, вентра́льно и латера́льно; 9 — *P. yanbulat* **sp.n.**, парало́бы гипопигиума, вентра́льно и латера́льно; 10 — *P. yanbulat* **sp.n.**, стернит 5 вентра́льно; 11 — *P. u. unicolor*, ♂ ари́ста; 12 — *P. yanbulat* **sp.n.**, ♂ ари́ста.

Pygophora unicolor unicolor Stein, 1920

Figs 4, 11.

Pygophora unicolor unicolor Stein, 1920.*Pygophora unicolor* Stein, 1920.

MATERIAL: INDONESIA, Bali prov., Handara Golf Resort, 8.245°S 115.160°E, 1300 m asl, 17–22.12.2016, N. Vikhrev, 1♀; Bedugul, 8.272°S 115.158°E, 1300 m asl, 23–27.12.2016, N. Vikhrev, 1♀. MALAYSIA, Borneo, Sabah state, Kinabalu Mt. env., 5.977°N 116.579°E, 1430 m asl: 18–25.12.2011, N. Vikhrev, 5♂♂, 4♀♀; 13–17.02.2014, N. Vikhrev, 6♂♂, 4♀♀.

DISTRIBUTION. Sunda Islands: Borneo, Java, Bali. The below given description of *P. yanbulat* sp.n. poses a question: if Crosskey's New Guinean record from Kassam (6.24°S 146.00°E) was a misidentification of *P. yanbulat* sp.n. or both species are distributed in New Guinea? Colleagues from Bishop Museum may examine Kassam's specimen and clarify the situation.

REMARKS. Males from Malaysian Borneo in ZMUM collection seem to be the first known males of nominotypical subspecies of *P. u. unicolor*. Male genitalia are identical to those of *P. u. crosskeyi* sp.n. (Figs 8 and 10), differences between two subspecies are in body size and leg colour of males.

Among 11 ♂♂ of *P. u. unicolor* there is one with remarkable femoral chaetotaxy: setae on *f*₂ and left *f*₃ are reduced while right *f*₃ has 3 *pv* and 2 *av* setae almost as strong as in females.

Pygophora unicolor crosskeyi Vikhrev, sp.n.

Figs 5, 8.

MATERIAL. Holotype ♂: THAILAND, Chiang Mae prov. (Rd. 1095, 5 km E of border with Mae Hong Son prov.), 19.25°N 98.64°E, 1130 m asl, 15.11.2010, N. Vikhrev. Paratypes, 6♂♂, 16♀♀: INDIA: Goa state (Margao env.), 15.124°N 74.003°E, 19.02.2009, K. Tomkovich, 1♀; Meghalaya state, Tyrna env., YPTrap, 25.24°N 91.67°E, 18–21.12.2013, K. Tomkovich, 2♀♀; West Bengal state, Kalimpong, 27.07°N 88.44°E, 1–11.12.2013, K. Tomkovich, 2♀♀. THAILAND: Chanthaburi prov.: Krating Resort env., 12.82°N 102.13°E, N. Vikhrev: 23.12.2007, 1♀; 8.02.2009, 1♀; A. Ozerov, 8.02.2009, 1♂; N. Vikhrev, 1–4.11.2009, 4♂♂ 4♀♀; Pong Nam Ron env. (12.92°N 102.25°E), 20.12.2008, N. Vikhrev, 1♀; Chiang Mai prov.: Sop Poeng env., 19.122°N 98.805°E, 13–17.11.2009, N. Vikhrev, 1♀; (Rd. 1095, 5 km E of border with Mae Hong Son prov.), 19.25°N 98.64°E, 1130 m asl, 15.11.2010, N. Vikhrev, 1♀; Chonburi prov., Chan Ta Then waterfall, 13.242°N 101.045°E, 3.02.2009, N. Vikhrev, 1♀; Trat prov., Ko Chang Isl., 12.1°N 102.3°E, 8–14.12.2011, N. Vikhrev, 1♂. VIETNAM, Lao Cai prov., Lao Cai env., 22.492°N 103.897°E, 135 m asl, 3.11.2015, D. Gavryushin, 1♀.

DISTRIBUTION. S Asian mainland from India in the west through Thailand to Vietnam in the east.

DIAGNOSIS. Small *Pygophora* with male femora yellow except for hind one which is more or less darkened in basal half. Paralobe of hypopygium at middle of the inner surface with a characteristic semicircular-shaped process (Fig. 8); sternite 5 as on Fig. 10.

P. unicolor crosskeyi sp.n. differs from the nominotypical *P. u. unicolor* as follows:

— Body length: ♂ — 3.8–4.1 mm, ♀ — about 5 mm. ♂: Femora mostly dark, only apical 1/4 yellow (Fig. 4). ♀: Abdominal tergites entirely black. Sunda Islands: Borneo, Java and Bali. *P. u. unicolor* Stein

— Body length: ♂ — 2.9–3.2 mm, ♀ — about 4 mm. ♂: Legs yellow, only *f*₃ more or less darkened in basal 2/3 (Fig. 5). ♀: tergites 3 to 5 whitish-grey on posterior margin. S Asian mainland: India, Thailand, Vietnam.

..... *P. u. crosskeyi* sp.n.

VARIATIONS. 1. One male (Thailand, Trat prov.) and female (Thailand, Chonburi prov.) have all femora and tibiae

evenly dark brown. Shinonaga, Tewari [2008] also described their male as “legs entirely dark brown”.

2. Three females (Thailand, Chiang Mae; India, Goa and West Bengal) have postpedicel entirely orange-yellow instead of normal brown with a yellowish base.

ETYMOLOGY. Named in memory of R. W. Crosskey, whose contribution to the study of the genus *Pygophora* is difficult to overestimate.

Pygophora yanbulat Vikhrev, sp.n.

Figs 6, 7, 9–10, 12–13.

MATERIAL. Holotype ♂: INDONESIA, Papua prov., Wame-na env., Baliem Resort, 2000 m asl, 4.059°S 139.032°E, 16–25.12.2014, N. Vikhrev, 1♂. Paratypes, 14♂♂, 13♀♀, the same locality, 11–16.12.2017, N. Vikhrev, M. Yanbulat.

DESCRIPTION. MALE (Fig. 6). Body length: 3.2–3.7 mm.

Head. Frons black, fronto-orbital plates brown, parafacial and face whitish-grey, occiput grey. Frons at least 1/3 head width. Anterior facets of eye enlarged. Apart from typical 2 inclinate and 2 reclinate setae, fronto-orbital plates with 1 supernumerary inclinate seta (0.3–0.6x as long as strong inclinates) and 1 small setulae near anterior inclinate seta. Antenna dark brown, postpedicel long, falling mouth margin by 0.1 of its length; postpedicel 5 times as long as wide. Arista with 6(5) upper and 4(3) lower hairs, these hairs form a sparse rows almost all along the length of arista (i.e. as in *P. longipila* Stein, 1910, not as in most *Pygophora*), arista hairs as long as width of postpedicel (Fig. 12). Palpi yellow with dense black setulae, mentum of proboscis shining black.

Thorax black, scutum in anterior view greyish-black, with 3 indistinct black vittae, humeral calli and pleura grey dusted. Typical 1+3 strong *dc*, but one more pair of *dc* setulae is distinct in front (0.3–0.4x as long as anterior *prst dc*). Acrostichal setulae in 2 rows, no minute hairs between *ac* rows present; 1–2 pairs of *prst ac* are distinctly elongated. Wings distinctly and evenly darkened. Calypters brownish, halter yellow.

Legs black, but knees yellowish and tibiae more or less brownish, especially fore tibia. *fl* with a row of 9–10 strong *pv* setae and 10–12 weak setulae. *t1* with long fine *pv* (2–2.5x *t1* width). *f2*: a row of 6–8 *a* setae in basal half; complete row of *av* which are in basal half 0.5–0.7x as long as femur width and short in apical half; 3(2) fine long (1.3x femur width) *pv* in basal half and a row of short *pv* in apical half; 2 preapical *pd. t2* with 2 *p* setae (1.5x as long as tibia width). *f3* in basal half with 3 *pv*, the second one the longest, about 2x as long as femur width; in apical half with 3 strong *av. t3* with 1 *av*, 2 *ad* and 2 *pd*, all strong 1.5–2x as long as tibia width.

Abdomen entirely dark. Anterior margin of tergites dusted grey, this dusting is more extensive and distinct on lateral surface; posterior margin of tergites has narrow whitish band. Tergites without specialized bristles; tergite 5 without marked dorsal keel. The paralobe of hypopygium as on Fig. 9; abdominal sternite 5 as on Fig. 10.

FEMALE (Fig. 7) differs from male as follows: larger, body length: 3.6–4.3 mm; arista with longer hairs; postpedicel shorter, falling mouth margin by 0.25 of its length; scutum in anterior view distinctly grey dusted, with 3 distinct black vittae; calypters whitish; all tibiae brownish; posterior margin of tergites with more extensive whitish band; shape of abdomen typical for *Pygophora* female, with pointed apex.

ETYMOLOGY. Named after the co-collector of the type series and my wife Maria Yanbulat, the surname is given in the nominative case as apposition.



Fig. 13. Baliem Resort, type locality of *P. yanbulat* sp.n.
Рис. 13. Курорт Балием, типовое место *P. yanbulat* sp.n.

DIAGNOSIS. *P. yanbulat* sp.n. differs from other species with entirely black body as follows:

— Supernumerary inclinate seta absent. Aristal densely haired in basal half, while apical half hairless (Fig. 11). Frons at middle 1/4 or less of head width. ♂: Mid and hind femora without strong setae. Tibiae and apical 1/4 of femora yellow, sometimes legs entirely yellow (Figs 4–5). At middle of the parolobe of hypopygium on the inner surface there is a characteristic semicircular-shaped process (Fig. 8). ♀: Apical 1/4 of femora yellow. Acrostichal with 2 rows of setulae and minute hairs inside.

..... *unicolor* Stein
— Apart from typical 2 inclinate and 2 reclinate setae, fronto-orbital plates with 1 supernumerary inclinate seta. Aristal hairs form a sparse rows almost all along the length of arista (Figs 12). Frons at middle 1/3 or more of head width. ♂: Mid and hind femora with setae as strong as in female, femoral setae 1.5–2x as long as width of femora (f_2 with 3 pv ; f_3 with 3 pv and 3 av). Legs entirely black or dark brown, only knees yellowish (Fig. 6). The parolobe of hypopygium without inner process at middle (Fig. 9). ♀: Femora entirely black (Fig. 7). Acrostichal setulae in 2 rows, without minute hairs inside. *yanbulat* sp.n.

The size, body shape and presence of supernumerary inclinate seta *P. yanbulat* sp.n. reminds *P. enigma* Crosskey, 1962, which also was collected in Baliem Resort. However,

P. enigma has the abdomen mostly and legs entirely yellow; the arista is haired on basal half only; the male genitalia are strongly different.

ECOLOGY. The majority of specimens of *P. yanbulat* sp.n. were collected at forest edge around Baliem Resort, from tree and brush foliage from a height of 1.5–3.0 m, some specimens from the Resort garden (Fig. 13).

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