

A Revision of the Genera *Pararhinoleucophenga* DUDA and *Paraleucophenga* HENDEL (Diptera, Drosophilidae), with Special Regard to Archestinic Characters

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Abstract The genera *Pararhinoleucophenga* DUDA and *Paraleucophenga* HENDEL are revised with descriptions of three new species, one of the former genus and two of the latter. *Paraleucophenga argentosa* (OKADA) is synonymized with *P. invicta* (WALKER). Taxonomic treatment of archestinic characters is discussed.

The genera *Pararhinoleucophenga* DUDA and *Paraleucophenga* HENDEL are small genera, having been represented only by one and three species, respectively, mostly described from Southeast Asia.

Key to Genera

1. Arista plumose, ventral branches not very short. Carina broadly convexed below (thus the generic name). Scutellum without exceptional setae. 3rd costal section with warts. Basal section of R_{4+5} usually with bristles. M curved to R_{4+5} distally. Apodeme of aedeagus long.
..... *Pararhinoleucophenga*
- Arista with dorsal branches long, ventral branches fine. Carina undeveloped. Scutellum usually with exceptional setae. 3rd costal section without warts. M and R_{4+5} parallel. Apodeme of aedeagus undeveloped.
..... *Paraleucophenga*

Genus *Pararhinoleucophenga* DUDA

Pararhinoleucophenga DUDA, 1924, Arch. Naturg., 90A (3): 185.

Type species. *Drosophila maura* DE MEIJERE.

Pararhinoleucophenga maura (DE MEIJERE)

(Fig. 1 D-F)

Drosophila maura DE MEIJERE, 1911, Tijdschr. Ent., 54: 406 (Java).

Pararhinoleucophenga maura: DUDA, 1924, Arch. Naturg., 90A (3): 185 (Java, Sumatra); DUDA, 1926, Suppl. ent., 14: 49 (Sumatra).

Leucophenga maura: OKADA, 1976, Makunagi, (8): 3 (Sri Lanka).

Diagnosis. Body about 2.5–3.0 mm in length. Acrostichal hairs in about 12 rows. Wing (Fig. 1 D) brownish especially anteriorly; 3rd costal section with about 2 warts. C3-fringe entire. Basal section of R_{4+5} with bristles. Periphallalic organs (Fig. 1 F) black; epandrium rounded below; surstylus elongate, distally with about 8–10 teeth. Phallic organs (Fig. 1 E) brownish black; aedeagus hairy, apparently bilobed; apodeme of aedeagus 1.5 times as long as aedeagus; anterior paramere seemingly absent.

Distribution. Java, Sumatra, India, Sri Lanka.

Pararhinoleucophenga nuda OKADA, n. sp.

(Fig. 1 A–C)

♂. Body about 4 mm in length, deep castaneous brown. Eye large, bare. Antenna with 2nd joint deep castaneous brown; 3rd grayish brown, twice as long as broad. Arista with 4 upper and 3 lower, rather short branches and a fork. Frons $5/8$ as broad as long, anteriorly narrowing. Face mat grayish black. Cheek very narrow. Proclinate orbital shorter than others; anterior reclinate much nearer to proclinate than to posterior reclinate. 2nd and 3rd orals slightly shorter than

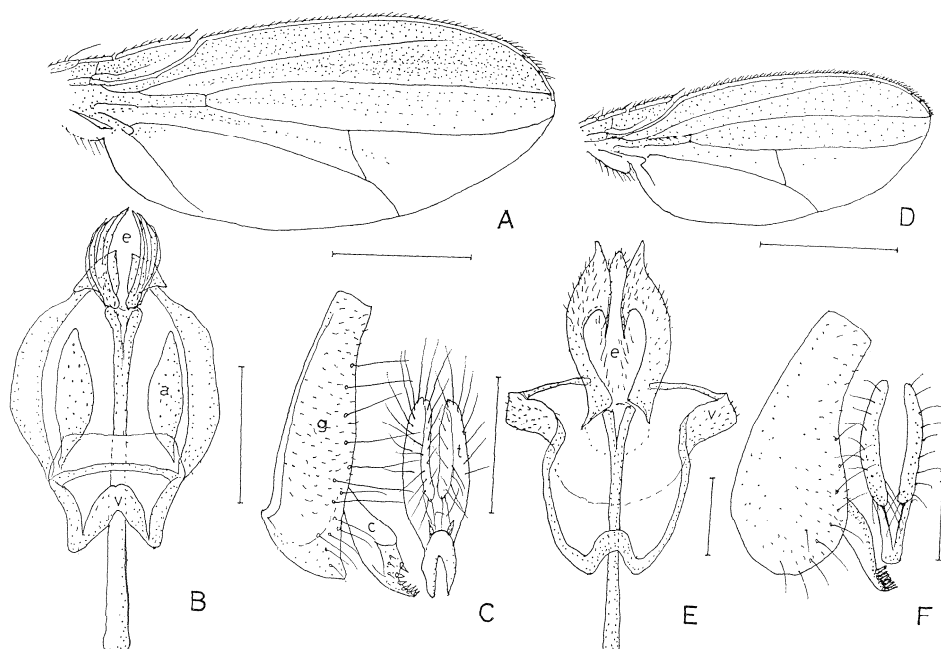


Fig. 1. A–C, *Pararhinoleucophenga nuda* n. sp., ♂; D–F, *P. maura*, ♂. — A, D, Wing; B, E, phallic organs; C, F, periphallalic organs. a, anterior paramere; c, surstylus; e, aedeagus; g, epandrium; t, cercus; v, hypandrium. Scales 1.0 mm for wings, 0.1 mm for other figures.

vibrissa. Mesoscutum mat dark red brown. Scutellum large, mat red brown, apically rounded. Thoracic pleura darker below. Humerals ca. 5, long. Anterior dorsocentrals 1/4 as long as posteriors. Acrostichal hairs in 14 or more rows. Three long sternopleurals. Lateral scutellars divergent, long; apicals equally apart from each other and from laterals. Legs yellowish brown. Wing (Fig. 1 A) brownish especially anteriorly; basal section of R_{4+5} without bristles. 3rd costal section with 2 warts. C-index 3.7; 4V-index 1.4; 4C-index 0.5; 5x-index 1.0; Ac-index 4.0; C3-fringe 4/5. Halter yellowish gray. Abdominal tergites mat pruinose dark brown; 1-2T slightly paler. Periphallalic organs (Fig. 1 C) dark orange brown; epandrium angular caudally below; surstylus elongate, with about 7 teeth distally; cercus elongate. Phallic organs (Fig. 1 B) dark brown; aedeagus apparently bilobed, each lobe plumate; apodeme of aedeagus very long, about 5 times as long as aedeagus; anterior paramere oblong.

Holotype. ♂, Alishan, Formosa, 14. VIII. 1967 (THROCKMORTON). Type in the National Science Museum, Tokyo (NSMT).

Distribution. Formosa.

Relationship. This species lacks a generic character of the bristles on the basal section of R_{4+5} (thus the specific name). It differs from *P. maura* also by having C3-fringe not entire and the apodeme of aedeagus longer.

Genus *Paraleucophenga* HENDEL

Paraleucophenga HENDEL, 1914, Suppl. ent., 3: 114; BÄCHLI, 1971, Explor. Parc natn. Upemba, (71): 128; LIN & WHEELER, 1972, Univ. Texas Publ., (7213): 254.

Type species. *Paraleucophenga invicta* (WALKER).

Paraleucophenga invicta (WALKER)

(Fig. 2 A-B)

Leucophenga invicta WALKER, 1857, J. Proc. Linn. Soc. Lond., (2), 4: 130 (Sarawak).

Leucophenga (Trichiaspiphenga) invicta: DUDA, 1924, Arch. Naturg., 90A (3): 185 (Formosa).

Paraleucophenga invicta: LIN & WHEELER, 1972, Univ. Texas Publ., (7213): 254 (Formosa).

Paraleucophenga triseta HENDEL, 1914, Suppl. ent., 3: 114 (Formosa).

Leucophenga (Trichiaspiphenga) argentosa OKADA, 1956, Syst. Study Dros. Jap., 24 (Japan) [n. syn.].

♂, ♀. Body about 4 mm in length. Arista with 10 long upper and 6 fine lower branches. Palpus black. Mesoscutum yellowish brown, silvery shining in ♂; thoracic pleura paler. C3-fringe 3/5. Halter yellow, knob dark above. Abdominal tergites yellow, silvery shining in ♂, with medially and laterally produced caudal black bands in ♀. Periphallalic organs (Fig. 2 A) yellowish brown; epandrium rounded below; surstylus quadrate, ventrally with about 4 short black teeth. Phallic organs (Fig. 2 B) brown; aedeagus robust, with pale round crown; anterior paramere oblong, black.

Specimens examined. 1 ♀, Mt. Kiyosumi, Chiba Pref., 11–13. VII. 1960 (OKADA); 1 ♂, 1 ♀, Kuantsuling, Tainan, 6. IV. 1965 (SAIGUSA); 1 ♀, Wulai, Taipei, 16. VIII. 1967 (OKADA); 1 ♂, Muara Mongkos, Sarawak, 25–27. VI. 1975 (SHIMA).

Distribution. Sarawak, Java, Sumatra, Formosa, Japan.

Paraleucophenga shimai OKADA, n. sp.

(Fig. 2 C–D)

♂. Body about 4 mm in length. Arista with 12 long upper and about 10 very short lower branches. Palpus yellow. Ocellar triangle black, gray pruinose. Periorbit yellowish gray. Frons yellowish gray, longer than broad. Face yellowish white. Clypeus yellow. Cheek very narrow, yellow. 2nd oral 2/3 length of vibrissa. Mesoscutum mat yellowish brown, not silvery shining. Scutellum brown, without setae beside scutellars. Thoracic pleura mostly brownish black. Humeral 1, long. Anterior dorsocentrals half as long as posteriors. Lateral scutellars divergent, apicals slightly longer than laterals, nearer to each other than to laterals. Sterno-index 0.7, median sternopleural long. Legs yellow. Wing hyaline, slightly fuscous anteriorly. C-index 3.7; 4V-index 1.8; 4C-index 0.7; 5x-index 1.0; Ac-index 1.6; C3-fringe 8/9. Halter orange yellow. Abdominal tergites orange yellow, 2–3T laterally with mat black spots, 4T to abdominal end mat black. Periphallalic organs (Fig. 2 C) brown; epandrium truncate below; surstylus huge, complex, with about 8 short teeth distally. Phallic organs (Fig. 2 D) black; aedeagus with round tip; anterior paramere large, fusiform.

Holotype ♂, Erawin Waterfall, Thailand, 10. XII. 1975 (SHINONAGA, SHIMA); 15 ♂ paratypes, same data as holotype; 14 ♂ paratypes, Saiyok, Thailand, 10–11. XII. 1975 (SHINONAGA, SHIMA). Types in NSMT.

Distribution. Thailand.

Relationship. This species is distinguishable from the foregoing species, *P. invicta*, by paler wing, darker abdominal tergites and huge surstylus. Absence of scutellar setae is exceptional among the genus.

Paraleucophenga javana OKADA, n. sp.

(Fig. 2 E–F)

♂. Body about 4.5 mm in length. Eye dark red. Antenna yellowish gray. Arista with about 10 upper long and 12 lower very short branches. Palpus yellowish gray, with a long apical and a few shorter ventral setae. Clypeus yellowish gray. Ocellar triangle mat black. Periorbits mat yellowish white. Frons mat yellowish white, parallel-sided, slightly narrower than median length anteriorly. Face yellowish white, unicolorous. Carina undeveloped, very weakly convexed. Cheek yellowish white. Anterior reclinate orbital slightly longer than proclinate, three times nearer to proclinate than to posterior reclinate, which is twice as long as

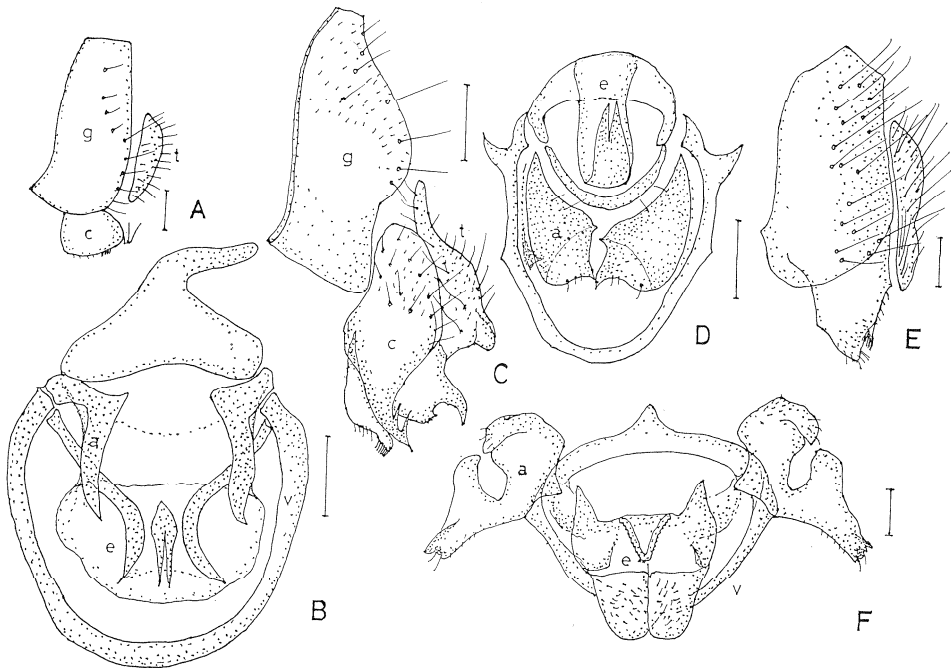


Fig. 2. A-B, *Paraleucophenga invicta*, ♂; C-D, *P. shimai* n. sp., ♂; E-F, *P. javana* n. sp., ♂.
— A, C, E, Periphallalic organs; B, D, F, phallic organs. Signs as in Fig. 1. Scales
0.1 mm.

proclinate. Vibrissa very long, other orals fine. Mesoscutum and scutellum mat orange brown, silvery shining, humeral callus paler. Scutellum laterally with a few rather long setae beside scutellars. Thoracic pleura pale yellow, white pruinose. Humeral 1, long. Acrostichal hairs in about 10 irregular rows. Anterior dorso-centrals $2/5$ as long as posteriors; length distance of dorso-centrals $2/7$ cross distance. Lateral scutellars divergent, apicals nearer to each other than to laterals. Sterno-index 0.7, median sternopleural slightly shorter than anteriors. Legs yellow; knee-joint of hind leg black. Wing fuscous along long veins; posterior crossvein clouded. C-index 4.5; 4V-index 1.1; 4C-index 0.5; 5x-index 1.5; Ac-index 1.5; C3-fringe $5/9$. Halter yellow, knob fuscous. Abdominal tergites mat black, silvery shining, basal segments paler. Periphallalic organs (Fig. 2 E) pale; epandrium rounded below, darker above; surstylus triangularly pointed below, with about 8 blunt black teeth subventrally. Phallic organs (Fig. 2 F) pale; aedeagus robust; anterior paramere large, complex.

Holotype ♂, Tugu, Java, 27-30. VII. 1971 (OKADA); 1 ♂ paratype, same data as holotype. Types in NSMT.

Distribution. Java.

Relationship. This species resembles *P. invicta* in thoracic coloration, but

differs in abdominal patterns, ventrally pointed surstylus and complex anterior paramere.

***Paraleucophenga semiplumata* (DUDA)**

Leucophenga semiplumata DUDA, 1939, Anns. hist.-nat. Mus. natn. hung., **32**: 38 (Uganda).

Leucophenga semiplumata: BURLA, 1954, Rev. suis. Zool., **61**: 209.

Paraleucophenga semiplumata: BÄCHLI, 1971, Explor. Parc natn. Upemba, (71): 129 (Congo, Uganda).

♂, ♀. Body about 3 mm, yellowish brown. Mesoscutum caudally silvery shining in ♂. Humeral 1. 3 long sternopleurals. Scutellum with a few setae beside scutellars. Wing grayish brown. Halter yellow. Surstylus simple, Anterior paramere complex.

Distribution. Uganda, Congo.

Key to the Species of the Genus *Paraleucophenga*

1. Scutellum without setae beside scutellars; ♂ mesoscutum not silvery shining; surstylus complex.....*P. shimai* n. sp.
- Scutellum with setae beside scutellars; ♂ mesoscutum silvery shining; surstylus simple..... 2.
2. Surstylus pointed below; anterior paramere complex
-*P. javana* n. sp.
- Surstylus truncate below
- 3.
3. Anterior paramere simple, blade-like.....*P. invicta*.
- Anterior paramere complex.....*P. semiplumata*.

Treatment of Archestinic Characters

The generic characters are not necessarily archekastic (ruling every member of a taxon: STENZEL, 1963) in view of the concepts of numerical taxonomy. This may accept the archestinic characters (ruling some members of the taxon: STENZEL, 1963) to be introduced in the hierarchic system.

Concerning the genera under consideration, the bristles on the basal section of R_{4+5} and the setae on the scutellum beside scutellars are the diagnostic characters of *Pararhinoleucophenga* and *Paraleucophenga*, respectively. These two characters are, however, found to be of archestinic, the former does not occur in *Pararhinoleucophenga nuda* and the latter does not in *Paraleucophenga shimai* n. sp. Other diagnostic characters of both genera, especially of male genitalia, are archekastic.

<i>Pararhinoleucophenga</i>	Archestinic characters basal section of R_{4+5} setigerous	Archekastastic characters carina developed; R_{4+5} and M convergent; apodeme of aedeagus long
<i>Paraleucophenga</i>	scutellum setigerous	carina undeveloped; R_{4+5} and M parallel; apodeme of aedeagus not developed

Occurrence of archestinic characters makes it sometimes reasonable or even necessary to repeat description of generic characters in the species description.

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Literature Cited

- STENZEL, H. B., 1963. A generic character, can it be lacking in a given genus? *Syst. Zool.*, **12**: 118-121.