

**Further additions to the genus *Leucophenga*
from Kumaon, India**
(Insecta, Diptera, Drosophilidae)

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Abstract

Leucophenga angulata n. sp., *Leucophenga clubiata* n. sp., and *Leucophenga okhalkandensis* n. sp. are described from Kumaon region, India.

Key words: *Leucophenga*, new species, Kumaon, drosophilid, Diptera, Drosophilidae.

Introduction

The great importance of Drosophilidae in genetic and evolutionary studies evoked most of the countries of the world to study the Drosophilid fauna thoroughly. The Indian subcontinent, however, still remains an exception, because most parts are yet to be explored. Recent surveys have yielded considerable data on Indian Drosophilid species (SINGH & GUPTA 1977, 1981, GUPTA & SINGH

1979, Dwivedi & GUPTA 1979, 1980, KUMAR & GUPTA 1988, GUPTA & KUMAR 1986, SINGH & BHATT 1988, SINGH & NEGI 1989, 1992, SINGH & DASH 1993, 1998). The present paper deals with the results of surveying studies undertaken in Kumaon region of Uttar Pradesh, which is previously unexplored (Fig. 1).

Systematic section

***Leucophenga angulata* n. sp.**

Figs. 2–8

Holotype: ♂ (Accession No. NTL-62) Paharpani, Nainital District, Uttar Pradesh, India, 10. VIII. 1992, SINGH & DASH. SMF D 3701.

Paratypes: 5 ♂♂, 3 ♀♀ (Cytogenetics Laboratory, Nainital) 1 ♂, 1 ♀ (*Drosophila* collection, Dept. of Biology, Tokyo Metropolitan University, Tokyo, Japan); all same data as holotype.

Etymology: The specific name *angulata*, referring to the angular shape of paramere.

The remaining alcoholic preserved specimens of the paratype series (Accession No. NTL-63) along with the mounted slides of genitalia and other taxonomic structures are deposited in

the Cytogenetics Laboratory, Zool. Dept. Kumaon University, Nainital, and in the Senckenberg Museum, Frankfurt am Main (SMF D 3701).

Diagnosis: Body yellowish, Abdominal tergites yellowish with a pattern of dark areas in ♂ and ♀.

Description: Head (♂, ♀): Arista with 6 dorsal and 3 ventral branches including the terminal fork. Antennae with 2nd and 3rd segments yellowish brown. Frons including the ocellar triangle light brown. Orbitals in the ratio of 10:7:13. Anterior reclinate orbital closer to proclinate. Vibrissa well developed, second oral not differentiated. Palpi pale slender with 3–4 marginal setae. The greatest width of cheek from the base of oral to eye border is about 1/10th greatest diameter of eye. Eyes dark red. Face and cheek dark brown.

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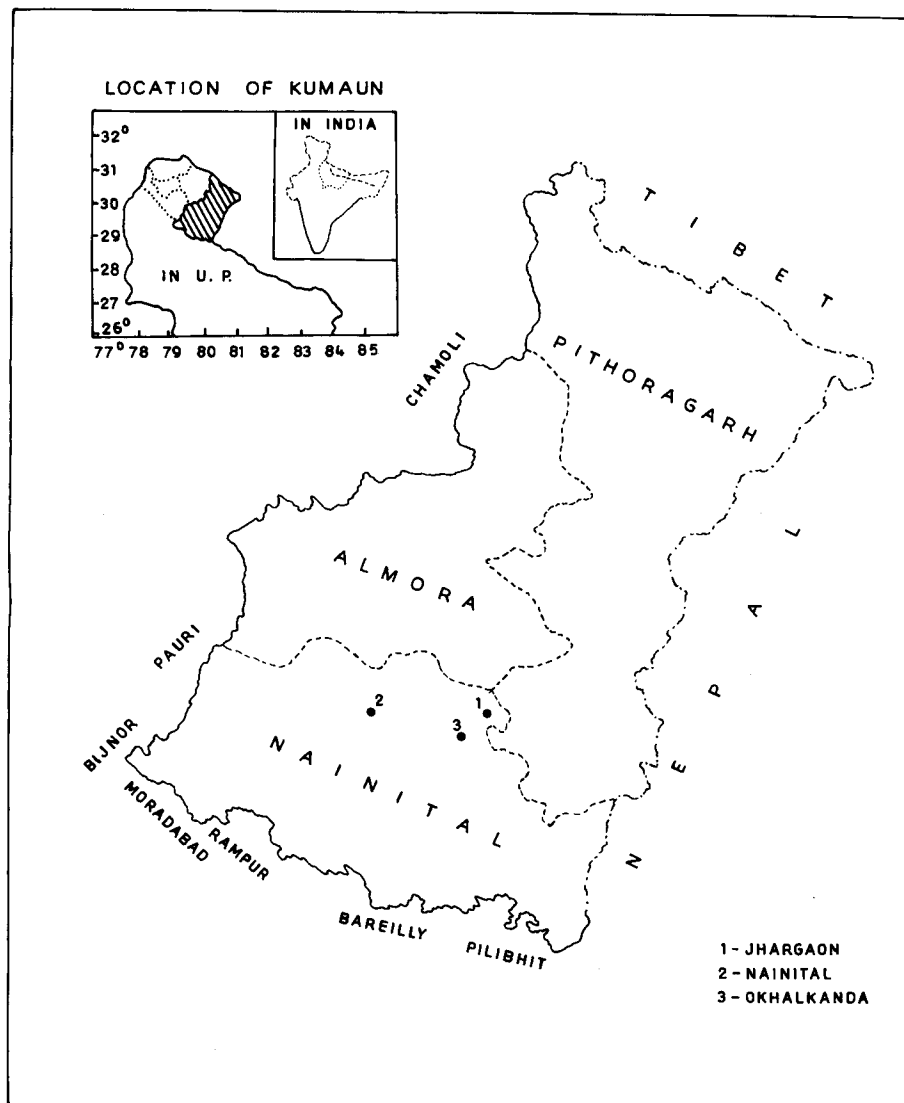


Fig. 1. Map of Kumaon region showing collection localities.

Thorax (♂, ♀): Acrostichal hairs in about 8–10 irregular rows. Anterior scutellars divergent, posterior crossing each other. Anterior dorsocentral two fifth length of posterior dorsocentral, Distance between anterior and posterior dorsocentral about half the distance between the two anterior dorsocentrals. Mesonotum and scutellum light brown. Mesonotum with two dark brown areas on both sides. Sterno index 0.8.

Wings (♂, ♀): transparent, approximate indices: C-index 3.18; 4V-index 1.82; 4C-index 0.97; 5X-index 1.52. C_1 bristles two unequal. C_3 bristles on basal about one half of the third costal section (Fig. 4).

Legs (♂, ♀): Legs yellowish brown; preapicals on all three tibiae; apicals on first and second tibiae (Fig. 5).

Abdomen (♂, ♀): Abdominal tergites yellow with pattern of dark areas. 1st abdominal tergite with two lateral dark spots. 2nd, 3rd and 4th abdominal tergites with two lateral and one middle black spot, 5th tergite with

two lateral black bands and 6th abdominal tergite completely yellow (Figs. 6, 7).

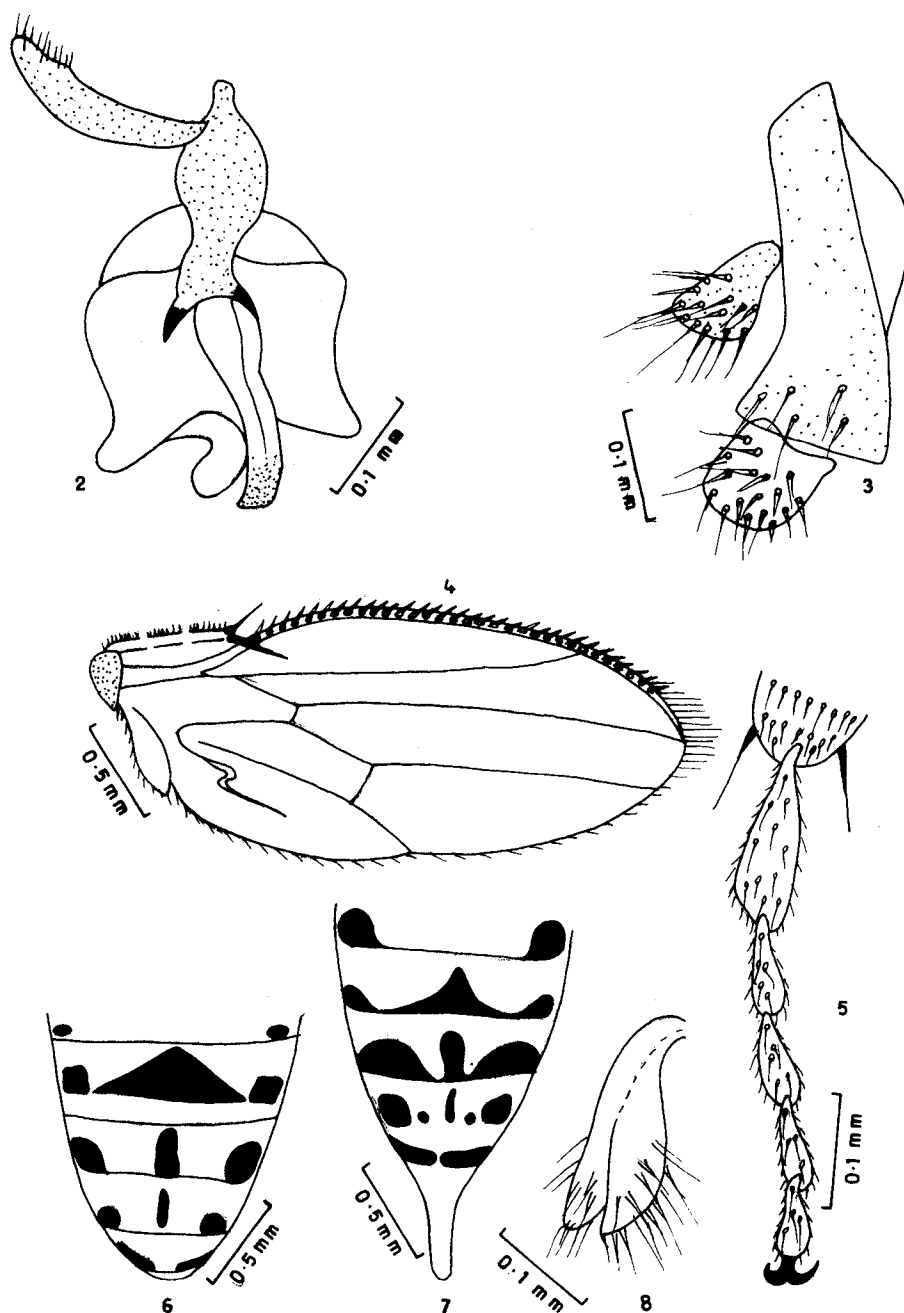
Average length of body: 6.7 mm (♂), 7.2 mm (♀).

Periphallallic organs (Fig. 3): Epanthrium narrow above and broad below. Upper portion bare, lower portion with about 5–6 large bristles. Primary surstylus large, quadrate with about 17–18 small thick bristles. Cerci small, triangular with about 13–14 large bristles.

Phallic organs (Fig. 2): Aedeagus large, narrow at the tip and swollen in the middle. Anterior gonapophyses large leaf like with several small sensilla. Posterior gonapophyses small and fused with the base of aedeagus. Basal apodeme of aedeagus slightly larger than ventral fragma. Ventral fragma quadrate.

Egg-guide (Fig. 8): Lobe pointed at the tip with 20–22 long bristles.

Remarks: This species is a member of the genus *Leucophenga* where it resembles *L. subpollinosa* DE



Figs. 2-8. *Leucophenga angulata* n. sp. - 2) phallic organs; 3) periphallallic organs; 4) wing, 5) ♂ foreleg; 6) abdomen ♂; 7) abdomen ♀; 8) egg-guide.

MEIJERE 1914 in the structure of periphallallic organs but distinctly differs from it in other structural details.

Leucophenga clubiata n. sp.

Figs. 9-13

Holotype: ♂ (Accession No. NTL-64), Government House, Nainital District, Uttar Pradesh, India, 15. vii. 1992, SINGH & DASH. SMF D 3702.

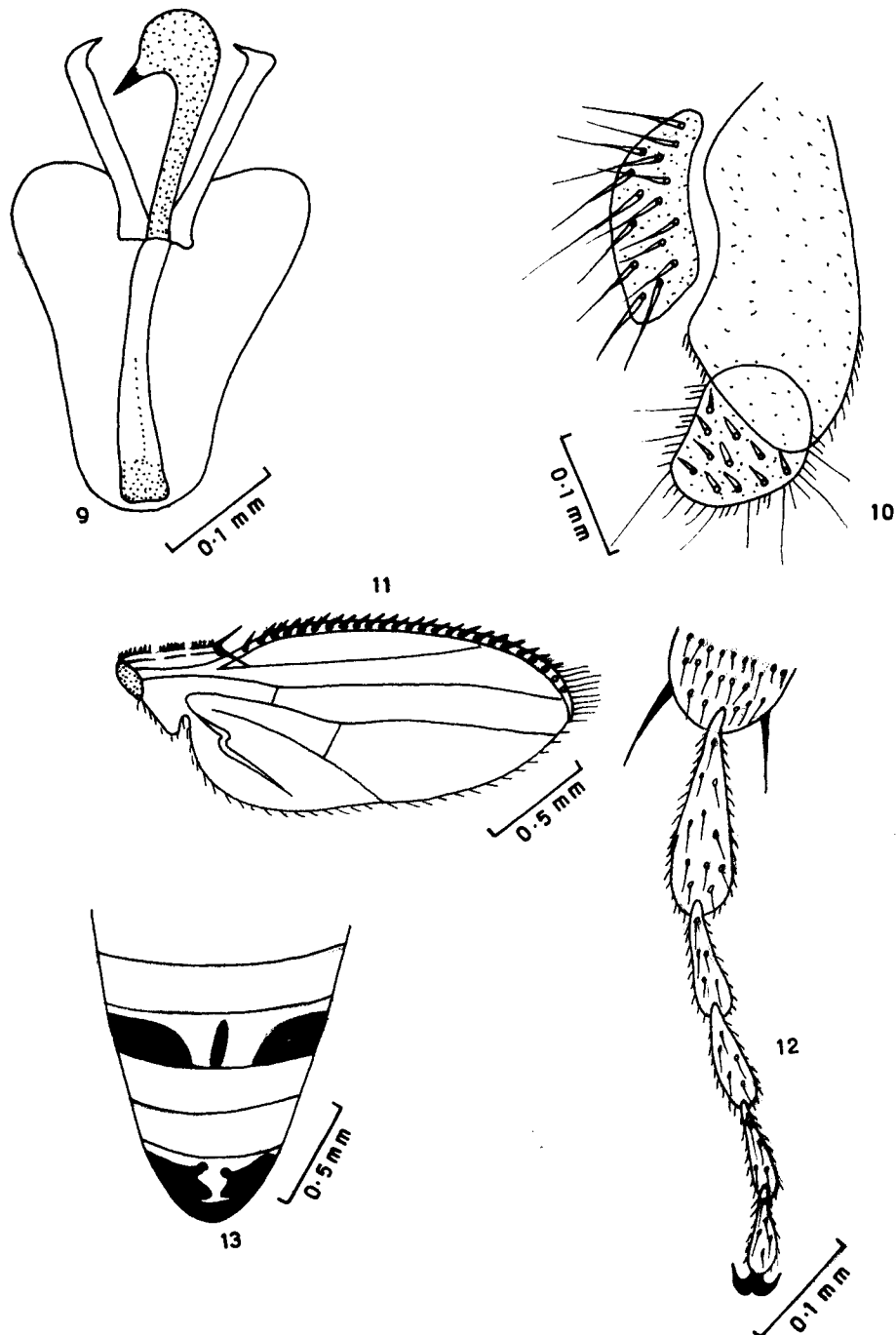
Paratypes: 6 ♂♂, 1 ♀ (Cytogenetics Laboratory, Nainital) (*Drosophila* collection, Dept. Biol. Tokyo Metropolitan Univ., Tokyo, Japan); all same data as holotype.

Etymology: Referring to the club-like shape of the aedeagus.

The remaining alcoholic preserved specimens of the paratype series (Accession No. NTL-65) along with the mounted slides of genitalia and other taxonomic structures are deposited in the Cytogenetics Laboratory, Zool. Dept., Kumaon University, Nainital, and in the Senckenberg-Museum, Frankfurt am Main (SMF D 3702).

Diagnosis: Body yellowish, abdominal tergites yellowish with a pattern of dark areas in male only.

Description: Head (♂, ♀): Arista with 8 dorsal and 3 ventral branches including the terminal fork.



Figs. 9-13. *Leucophenga clubiata* n. sp. - 9) phallic organs; 10) peripheral phallic organs; 11) wing; 12) ♂ foreleg; 13) abdomen ♂.

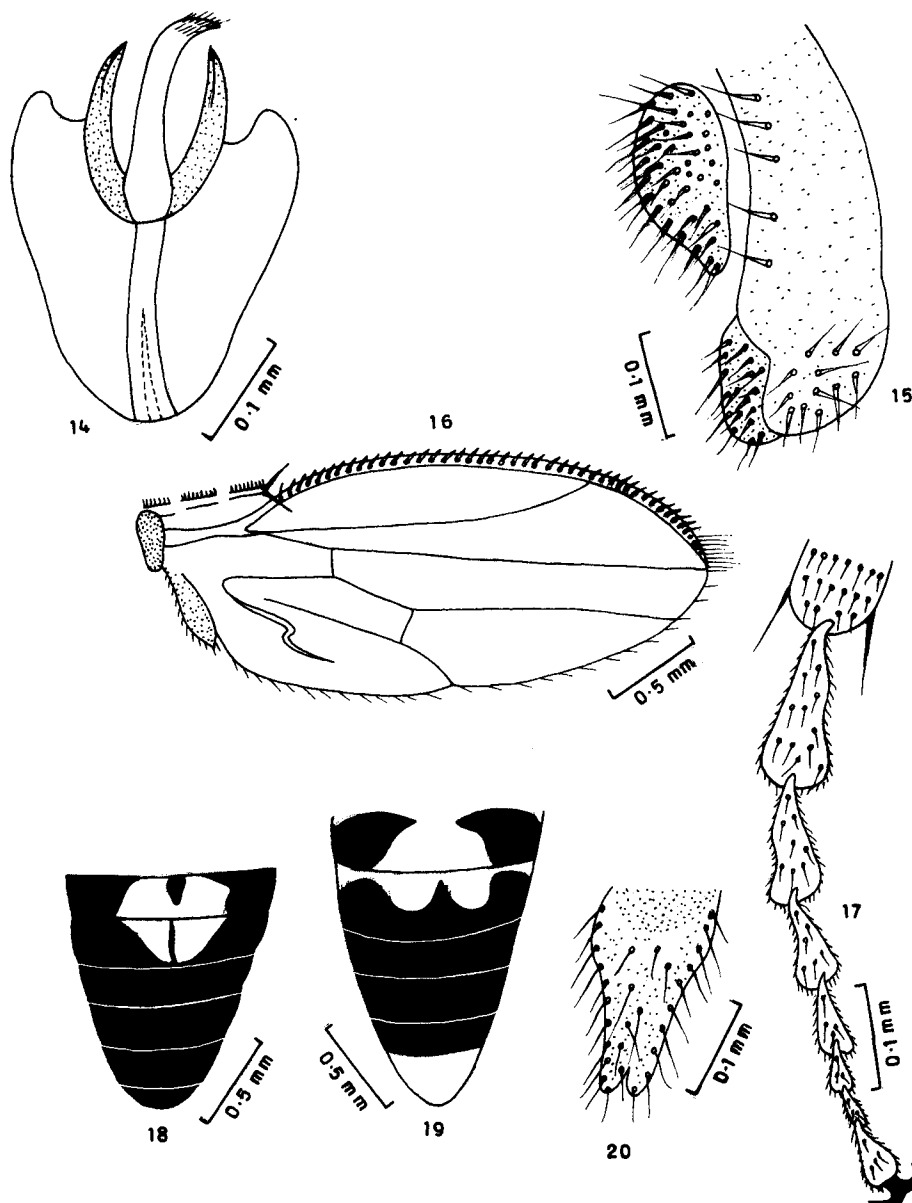
Antennae with 2nd and 3rd segments light brown. Frons including the ocellar triangle light brown. Orbital in the ratio of 6:8:5. Anterior reclinate orbital close to proreclinate. Vibrissa well developed, second oral not differentiated. Palpi pale, slender with 3-4 marginal setae. Face and cheek dark brown, greatest width of cheek one-fifth greatest diameter of eye. Clypeus dark brown. Eyes dark red.

Thorax (♂, ♀): Acrostichal hairs in 8 irregular rows. Anterior scutellars parallel, posterior crossing each other.

Anterior dorsocentral two fifth length of posterior dorsocentral about half the distance between the two anterior dorsocentrals. Mesonotum and scutellum light brown. Sterno-index 0.87.

Wings (♂, ♀): Transparent, approximate indices: C-index 2.22; 4V-index 2.12; 4C-index 1.30; 5X-index 1.46. C1 bristles two unequal; C3 bristles on basal about three quarters of the third costal section (Fig. 11).

Legs (♂, ♀): Yellowish brown, preapicals on all three tibiae; apicals on first and second tibiae (Fig. 12)



Figs. 14–20. *Leucophenga okhalkandensis* n. sp. – 14) phallic organs; 15) periphallallic organs; 16) wing; 17) ♂ foreleg; 18) abdomen ♂; 19) abdomen ♀; 20) egg-guide.

Abdomen (♂, ♀): Abdominal tergites white with a pattern of dark areas. In male 1st abdominal tergite completely white; 2nd tergite with two large lateral and one central black spot; 3rd and 4th tergites completely white; 5th tergite with two lateral black spots and 6th tergite completely black. (Fig. 13).

Average length of body: 5.6 mm (♂), 5.8 mm (♀).

Periphallallic organs (Fig. 10): Epandrium narrow above broad below, completely pubescent. Primary surstylus large oval, fused with epandrium with about 10–11 small black teeth and several fine bristles. Cerci large, separated from epandrium, with about 15–20 large bristles.

Phallic organs (Fig 9): Aedeagus large, curved and club shaped. Basal apodeme of aedeagus equal to ventral fragma. Anterior gonapophyses large, rod like and point-

ed at tip. Posterior gonapophyses absent. Novasternum rounded. Ventral fragma triangular.

Remarks: This species is a member of the genus *Leucophenga* where it resembles *L. leucoxona*, DUDA (1923) in the structure of periphallallic organs but distinctly differs from it in other structural details.

Leucophenga okhalkandensis n. sp.

Figs. 14–20

Holotype: ♂ (Accession No. NTL-66) Okhalkanda, Nainital District, Uttar Pradesh, India, 15. VIII. 1992. SINGH & DASH. SMF D 3703.

Paratypes: 5 ♂♂, 3 ♀♀ (Cytogenetics Laboratory, Nainital); 1 ♂, 1 ♀ (*Drosophila* collection, Dept. Biol., Tokyo Metropolitan Univ., Tokyo, Japan); all same data as holotype.

Etymology: The name is referring to the type locality.

The remaining alcoholic preserved specimens of the paratype series (Accession No. NTL-67) along with the mounted slides of genitalia and other taxonomic structures are deposited in the Cytogenetics laboratory, Zool Dept., Kumaon University, Nainital and in the Senckenberg-Museum, Frankfurt am Main (SMF D 3703).

Description: Head (♂, ♀): Arista with 5 dorsal and 2 ventral branches including the terminal fork. Antennae 2nd and 3rd segments light brown with a dark brown spot in between the segments. Frons including the ocellar triangle bright yellow. Orbital bristles in the ratio 9:8:13. Anterior reclinate orbital closer to proclinate. Vibrissa well developed. Second oral not differentiated. Palpi light brown with 3–4 marginal setae. Face and cheek dark brown. The greatest width of cheek from the base of oral to eye border is about 1/2th greatest diameter of eye.

Thorax (♂, ♀): Acrostichal hairs in about 9–10 irregular rows. Anterior scutellars divergent, posterior crossing each other. The distance between the anterior and posterior dorsocentrals half the distance between the two anterior dorsocentrals. Anterior dorsocentral two fifth length of posterior dorsocentral.

Wings (♂, ♀): Transparent, approximate indices: C-index 2.72; 4V-index 2.07; 4C-index 1.04; 5X-index, 0.25. C₁ bristles are two unequal; C₃ bristles on basal about three quarters of third costal section (Fig. 16).

Legs (♂, ♀): Light yellow, preapicals on all three tibiae (Fig. 17).

Abdomen (♂, ♀): Abdominal tergites yellow with a pattern of dark areas. In male 1st abdominal tergite with two lateral and one middle black spot; 3rd, 4th, 5th and

6th abdominal tergites completely black. In female 1st abdominal tergite with two lateral black spot, 2nd abdominal tergite with two lateral and one middle triangular spot. 3rd, 4th and 5th abdominal tergites completely black; 6th abdominal tergite completely yellow (Figs. 18, 19).

Average length of body: 6.8 mm (♂), 7.1 mm (♀).

Periphallallic organs (Fig. 15): Epandrium narrow above and broad below, upper portion with about 4–5 large bristles. lower portion with about 10–12 small bristles. Primary surstylus small leaf like, fused with epandrium and with about 17–18 small bristles. Cerci large, triangular with about 40–45 large bristles.

Phallic organs (Fig. 14): Aedeagus large, Curved at tip with small sensilla. Anterior gonapophyses large leaf like. Posterior gonapophyses absent. Basal apodeme of aedeagus equal to ventral fragma. Novasternum rounded. Ventral fragma triangular.

Egg-guide (Fig. 20): Lobed, with about 27–29 large bristles.

Remarks: This species is a member of the genus *Leucophenga* where it resembles *L. albifasciata* OKADA 1966 in having similar periphallallic organs but distinctly differs from it in other structural details.

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