

FURTHER STUDIES OF ASIAN MACROCERINAE
(DIPTERA: MYCETOPHILIDAE), WITH THE
DESCRIPTION OF A NEW CHIASMONEURINE
GENUS, *LANEOCERA*

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Abstract.—*Laneocera*, a new Chiasmoneurine genus with a single included species, *L. magnifica* from southern India, is described. Four new species of *Macrocera*, *M. districta*, *M. alacra*, *M. elegantula* and *M. lacustrina* from the northern Indian subcontinent are described. Further records are furnished for *M. brunnea*, *M. inconspicua*, *M. nepalensis* and *M. simbhanjangana*. Wing photographs and drawings of mouthparts and terminalia are presented.

In 1913, de Meijere described the monotypic genus *Chiasmoneura* from Java with the unique female type, *C. anthracina*. In 1929, Edwards described a unique female, *C. cyclophora*, from the New Hebrides. Matile (1972) described four more species from the Ethiopian Region and also described a new genus *Chiasmoneurella* from that region. The new genus was based on differences from *Chiasmoneura* by antennal length and setation, and by development of the wing veins. In a collection of fungus gnats taken by F. Schmid in southern India, I have two specimens of a closely related form which I am referring to a new genus based on differences of female abdominal structures, the lack of a projecting vertexal prominence, the degree of development of the clypeus and the development of the wing venation.

The last study of Asian *Macrocera* was that by Coher (1963). The Asian material in the present study, mostly collected by F. Schmid, adds four new species from the northern portion of the Indian subcontinent. New data are given for four species: *M. brunnea* Brunetti, 1912; *M. inconspicua* Brunetti, 1912; *M. nepalensis* Coher, 1963 and *M. simbhanjangana* Coher, 1963. A complicated macrocerine fauna has developed in Southeast Asia, showing a connection to the African fauna as principally illustrated by the Chiasmoneurini.

Holotypes are deposited with the National Museum of Natural History, Washington, D.C.

Laneocera, new genus

It is a Chiasmoneurella

Diagnosis. This south Indian macrocerine genus related to *Chiasmoneura* is unique in several respects and broadens the characterization of the Chiasmoneurini. The genus, which is described from female specimens only, is principally characterized by reduced venation at fM, genital flaps on SVII and a reduced vertexal area.

Description. Female. 4.5 mm. Head with vertexal area not protruding, three equal ocelli, laterals on small prominences separated by a wide furrow with the median ocellus anterior; eyes ellipsoid; antenna filiform and at least as long as body; clypeus (Pl. 1) strongly inflated, setose; mouthparts (Pl. 1) strongly developed and curved

around and appressed to ventral portion of the head. Thorax with pleura and scutellum bare; mesoepimeron very narrow ventrally. Wing (Pls. 1, 2), macrocerine, R3 absent; anterior branch of R not thickened where it meets the costa; base of M and fM nearly obsolescent; base of first branch of Cu obsolescent; anal veins strongly developed; long macrotrichiae over entire wing with costa strongly setose, apical and posterior margins finely setose. Abdomen with SVII modified so that a pair of genital flaps (Pl. 1) is present; post-VII segments strongly reduced.

Male unknown.

Discussion. Chiasmoneurine elements of this genus are its habitus; the form of the head capsule; the long antennae; the setiferous, inflated clypeus; the mouthparts large and produced beneath the head; the proportions and form of the pleural sclerites; the pattern, venation, setation and form of the wing; the strongly reduced terminal abdominal segments. This macrocerine fly closely resembles a *Chiasmoneura*, but, the reduced vertexal area, the presence of genital flaps and reduced venation at fM are unique and serve to easily separate the two genera.

Type species. *Laneocera magnifica* n. sp. described as follows.

***Laneocera magnifica*, new species**

Diagnosis. Not presently closely related to any other Chiasmoneurini but clearly a member of that taxon.

Description. Female. 4.5 mm. Head brown, vertexal area subpentagonal, not produced and bare; occipital area lighter brown with strong brownish setae; eyes ellipsoid; lateral ocelli their own diameter from eye margin, each situated on a low prominence and separated by a broad median furrow with an anterior ocellus; antenna filiform with scape inflated and setiferous, pedicel doughnut-shaped, flagellar segments one to nine subequal in length; scape, pedicel and first flagellar segment yellowish brown, segments two to five with a narrow basal and distal yellowish band, remainder brown except for missing distal segments, flagellum at least as long as body; clypeus strongly inflated, setose (Pl. 1); palpi brown, four-segmented plus a basal boss, second, third and fourth segments flattened, second segment broadened apically with the third segment arising pre-apically from it; mouthparts well-developed, lying below the ventral surface of the head and strongly appressed to it. Thorax shiny red-brown, mesonotal setae sparse and short, humeri narrowly yellow-brown; pleura bare, mesoepimeron reduced so that it is very narrow ventrally, katepisternite about twice as large as anepisternite, anterior pronotum yellow-brown, scutellum and pronotum bare. Legs with forecoxa yellowish, mid coxa and hind coxa distally yellow-brown; femora yellowish basally, light brown distally, all legs appearing darker apically; hind femur narrow at base and widening apically; foretibia inflated apically; tibiae with apical with apical spurs subequal to terminal width of tibiae. Wing (Pls. 1, 2) with macrotrichia which are reduced in area of anastomosis; R3 absent; costa very setose. Halter yellow-brown with a long stem. Abdomen shiny red-brown, TI laterally yellow-brown, TV and TVI lighter, SIII also appearing lighter anteriorly. SVII divided into a pair of flaps (Pl. 1); segment VIII strongly reduced. *Note:* the posterior portion of the holotype abdomen was lost after the preliminary pencil sketches were completed. The illustration is from that sketch and represents the appearance as best as can be presently demonstrated.

Male. Unknown.

Holotype. INDIA: Madras, Devala, 3,000', 8 January 1959.

Paratopotype. Same data, abdomen incomplete, sex unknown. In my personal collection.

Macrocera brunnea Brunetti, 1912

Male. Wing with R5 at most one half as long as M1+2. Dististyle of the Singtam specimen narrower towards its base than that of the typical form.

Records. INDIA: West Bengal, Singtam, 2,625', 11 March 1959, male; Madras, Ootacamunda, 7,200', 25 December 1958, 3 males.

Discussion. The known range of *brunnea* is extended about 1,000 miles southward from south of Himalayas to a higher altitude in southern India. The discontinuous range is probably due to lack of collecting records from intermediate areas.

Macrocera nepalensis Coher, 1963

Male. Abdomen with T1 yellowish, TII-TIV with narrow anterior dark band, TV-TVI chestnut. Wing with Sc sparsely setose; length of R4 half of M1+2. Rumkheng male with R4 subequal to M12, tip of M1 bent towards R5, dististyle of terminalia subrectangular (possibly an artifact of a unique, uncharacteristically hardened specimen even after maceration in potassium hydroxide).

Female. Unknown.

Records. INDIA: Agra, 4,000', 5 April 1958; Assam, Shnongpdeng, 1,000', 7 April 1960; Rumkheng, 3,000', 20 March 1960; West Bengal, Singtam, 2,625', 11 March 1959, 2 specimens; Kumaon, Dobalgaon, 5,000', 14 April 1958.

Discussion. It is of interest to note the prehensile tarsi of this species which suggests a habit of hanging on spider webs or fungal mycelia, or perhaps a use in mating. The specimen from Rumkheng is double the size of all other known specimens.

Macrocera inconspicua Brunetti, 1912

Male. 5.5 mm. Antenna 5× body; mesonotum with median anterior chestnut stripe about $\frac{2}{3}$ its length and with two lateral stripes from posterior margin to anterior fourth. Wing with C produced beyond apex of R5 about one-fourth of distal margin of cell R5. Abdomen with posterior margin of TII-TVII light.

Female. 5.5 mm. As for the male with a slightly more robust body. Wing with C only slightly produced beyond R5; tip of wing slightly more rounded than that of male. Setation of Cu1 and Cu2 heavier than that of male. Abdomen with posterior margin of all segments light.

Records. INDIA: Kumaon, Tarsali, 6,000', 6 May 1958, male; Binaik Chatti, 7,000', 16 June 1958, female.

Discussion. Although the color and pattern of the abdomens of both male and female do not match *inconspicua* as given by Brunetti, this is probably the species he had before him. The female is described for the first time. The male terminalia (Pl. 1) are figured for the first time. Based on the form of the dististyle it forms a complex with plain-winged Palearctic *M. crassicornis* Winnertz, 1863 and the pattern-winged Oriental species, *nepalensis* Coher, and *lacustrina* and *alacra* n. spp.

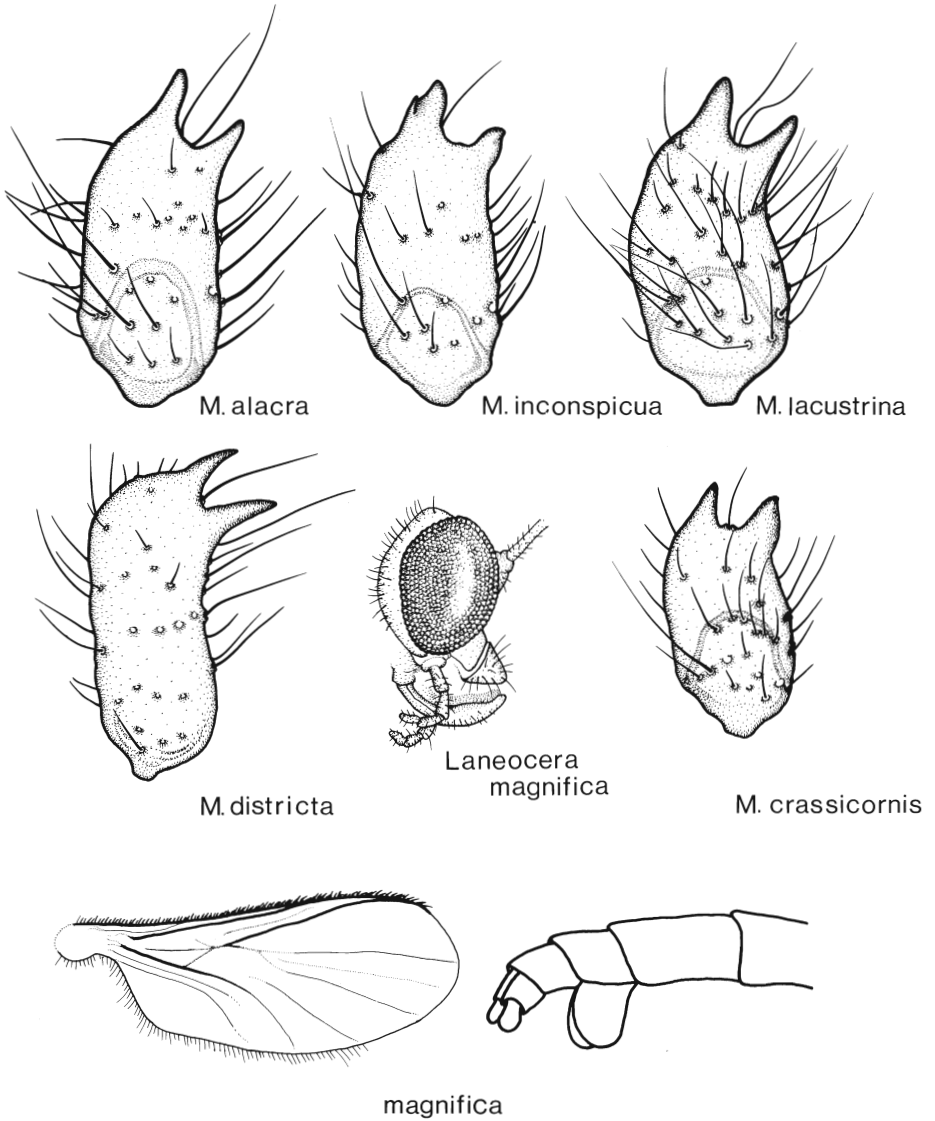


Fig. 1. Dististyles of Asian *Macrocera* spp. with smaller setae omitted. Lateral view of head of *Laneocera magnifica*. Wing of *L. magnifica* to show venation, pigmentation omitted. Sketch of the terminal abdominal segments of the female types of *L. magnifica* showing genital flaps on segment seven. Not drawn to scale.

Macrocera simbhanjangana Coher, 1963

Records. NEPAL: Simbhanjang, 8,190', 1 October 1956, female; 19 October 1957, 2 males; 8,150', 17 April 1957, female; 24 July 1956, 2 males.

Discussion. Flies taken at 8,190' are topotypes.

Macrocera districta, new species

Diagnosis. This species is somewhat like *M. alacra* n. sp. in that both have a well developed subapical wing band. They are easily separated by other characteristics of the wing such as the heavy basal infuscation of *alacra* and the heavy apical infuscation of *districta* and its broad, subapical band which reaches to the posterior margin.

Description. Male. Head reddish brown; antenna $2 \times$ wing, with first four flagellar segments yellowish, remainder brown. Thorax with mesonotum red-brown, posterior margin of katapisternite yellow, scutellum yellow, postnotum mostly yellowish with some posteromedian red-brown. Wing (Pl. 2). Halter yellow. Legs yellow; forefemur 0.5 length of hind femur; forebasitarsus 0.9 length of foretibia, tarsi not prehensile. Abdomen with TI–TVI dark posteriorly, TII shorter than TIII and TIV and about half dark. Terminalia (Pl. 1) with dististyle subrectangular and with two terminal spines almost lateral.

Female. Unknown.

Holotype. IRAN: Waliabad, 16 September 1956.

Discussion. *M. districta* is the first Asian *Macrocera* to be described with a wing band which lies distad of the anastomosed veins and the $fM1 + 2$; the band runs from the point where both R1 and R4 join the costa, to the apex of Cu2 at the posterior margin of the wing. In addition, the wing tip is broadly infuscated. The terminalia are somewhat like those of *M. elegans* Brunetti, although the apical spines are shorter and more blunt and the base of the dististyle is broader and more rounded.

Macrocera alacra, new species

Diagnosis. This new species has, as its closest relatives, *nepalensis* and *districta*. It is easily separated from these by the much more highly infuscated area at the base of the anastomosis of M and Rs as well as having the wing band pass distad of the $fM1 + 2$.

Description. Male. 5–6 mm. Head brown to red-brown; palpus brown to red-brown; antenna $2-2.5 \times$ wing, yellowish. Thorax with mesonotum yellow-brown to reddish-brown with pale acrostichal stripes and a very narrow median pale stripe in the darker forms; pleura yellow-brown to red-brown; scutellum yellow-brown; postnotum yellow-brown to red-brown. Wing (Pl. 2), fR entirely infuscated or with proximal angle hyaline; apex with slight infuscation in cell R5 and M1 (Gangrea) or beyond Cu1 (Dobalbeta). Legs with forefemur about 0.5 length of hind femur and slightly shorter than foretibia; all tarsi prehensile. Halter with knob dark, stem pale. Abdomen brown with lateral pale area or entirely red-brown. Terminalia (Pl. 1) with a subrectangular dististyle with two simple terminal spines; apical spines of dististyle more robust in Gangrea material.

Female. 4.5–5 mm. With the same characteristics as the male except for antenna $1.5 \times$ wing length, more extensive darkening of the apex of the wing, forebasitarsus about 0.85 length of foretibia.

Holotype. Male. INDIA: Kumaon, Gangrea, 9,000', 12 June 1958.

Paratopotypes. Two males with the same data.

Paratypes. Male. INDIA: Kumaon, Trijugi Narain, 7,000', 26 May 1958; two females, Dobalbeta, 8,000', 30 May 1958.

Allotype. Same data as the holotype.

Discussion. This species has a wing band lying distad of the anastomosed veins and $fM1+2$. The band does not attain the posterior margin of the wing but nearly reaches $Cu1$ or extends just beyond it; the apex of the wing is variably infuscated. Despite minor differences in the Gangrea specimens, they are considered to be conspecific with the other material of *alacra*. Much more material will have to be examined to determine whether this approach is correct.

Macrocera elegantula, new species

Diagnosis. Presently, this species is considered to be separable from its nearest relative, *M. flavicosta* Brunetti, by its much more extensively trichiate wing membrane and darker markings of the wing along the coastal margin.

Description. Female. 6.5 mm. Head mostly red-brown, darker around ocelli; palpus red-brown; antenna at least $2\times$ wing length, with scape and pedicel light brown. flagellum dark. Thorax with anepisternite, katepisternite and pleurotergite dark red-brown, mesoepimeron yellow-brown; mesonotum with light humeral area connected to light acrostichal stripes, remainder dark red-brown; scutellum yellow-brown; postnotum red-brown mediad, yellow-brown laterally. Forefemur less than half as long as hind femur. Forebasitarsus about 0.9 of foretibia. Wing (Pl. 2) with extensive macrotrichia apically in cell Sc and in all of cell $R1+2+3$, heaviest apically in cells $R4$, $R5$ and $M1$; $M2$ with trichiation occurring in a line to base, cells $Cu1$ and $Cu2$ with a similar line of setae less developed, anal cell with trichiation apically. Abdomen brown with light posterolateral areas on $TII-TV$; posterior segments damaged.

Male. Unknown.

Holotype. INDIA: Kumaon, Hanuman Chatti, 9,000', 30 June 1958.

Discussion. This species is closely related to or perhaps even conspecific with *flavicosta* but has more extensive markings along the costal area of the wing and a lighter but more extensive darkening around the apex of the wing than figured by Brunetti. The presence of extensive macrotrichia on the wing of this new species apparently serves to separate the two. *M. elegantula* has the most heavily trichiated wing of any Asian *Macrocera* known at this time.

Macrocera lacustrina, new species

Diagnosis. This species, which is close to *M. crassicornis* and *M. inconspicua*, can be separated from them by the infuscated marking at the anastomosis and fM of the wing. The wing is more yellowish than that of *crassicornis*; in *inconspicua*, the costa projects slightly beyond $R1$ and ends at the apex of the wing. The microtrichia of the wing are smaller than those on the membrane of *inconspicua* and the veins are less setose.

Description. Male. 5.5 mm. Head yellow-brown, antenna $1.5\times$ wing length. Thorax yellow-brown, broad median stripe on anterior two-thirds with acrostichal stripes from posterior margin to humeral angle; pleura yellow-brown with lighter scutellum

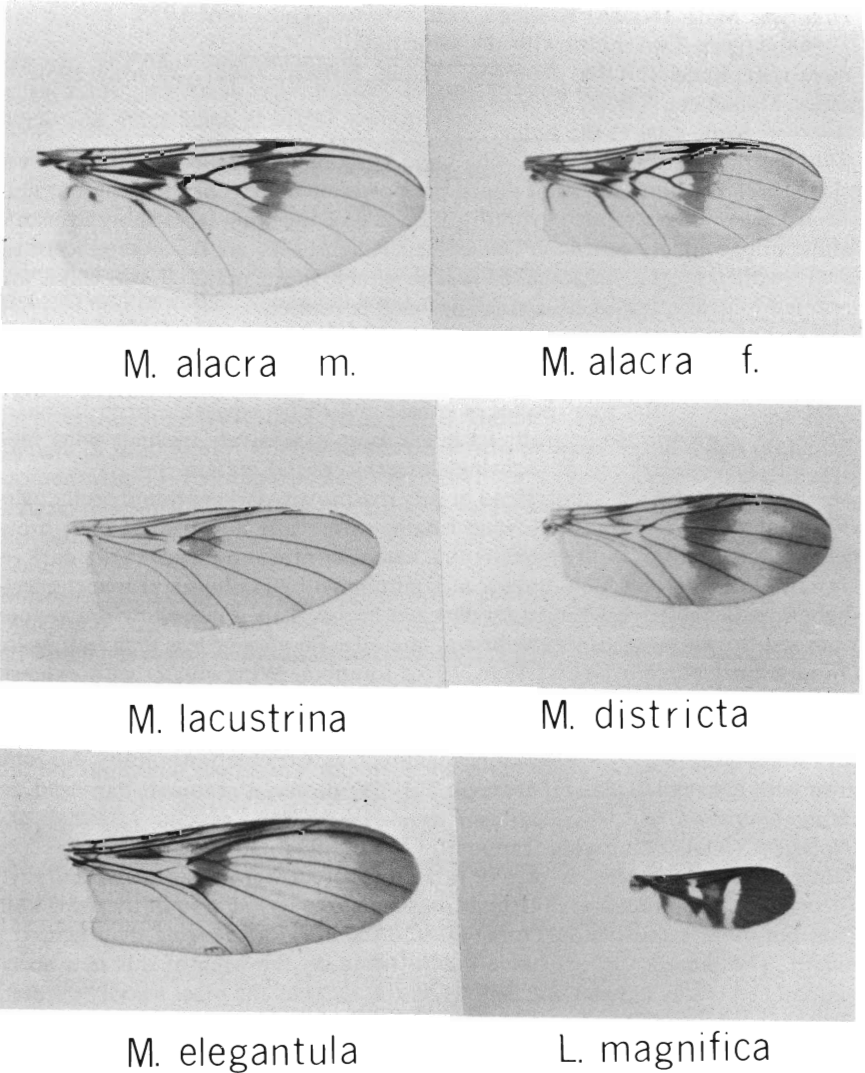


Fig. 2. Wings of Asian *Macrocera* spp. and *Laneocera magnifica*. Not photographed to scale.

and postnotum. Legs with forebasitarsus 0.9 length of foretibia, foretarsi prehensile (other legs missing). Wing (Pl. 2), clear, with a small dark area at anastomosis and fm; C ends at apex of R1. Abdomen yellow with posterior third of T1-TVI red-brown. Terminalia (Pl. 1) with a subrectangular dististyle with two broad apical spines.

Female. Unknown.

Holotype. PAKISTAN: Kumaon, Hanuman Chatti, 9,000', 30 June 1958.

Discussion. *M. lacustrina* has been taken at a higher altitude than any other species of *Macrocera* known to me. The terminalia are rather similar to those of *alacra*. However, the terminal spines of *lacustrina* are distinctly broader as is the entire dististyle.

KEY TO *MACROCERA* BASED ON KNOWN MALES

The wing of *vishnui* is known only from a single damaged specimen; it appears to fit the second couplet of 1 in the following key. The terminalia of *alternata* have not yet been studied nor figured.

1. Wing infuscation primarily confined to the costal area above R5 and through the anastomosis 2
 - Wing unmarked or marked otherwise 3
2. Costal margin of wing with a series of five dark infuscated spots and with suffused areas between them *alternata*
 - Costal margin of wing with a single infuscated spot where R1+2+3 joins the costa and cell R4 infuscated except at base, very lightly suffused at apex of cell R5 and M1 *brunnea*
3. Wing plain, no infuscated pattern 4
 - Wing variously infuscated 5
4. Apex of wing suffused or hyaline; dististyle with a single large apical spine plus a small spine at its base *simbhanjangana*
 - Wing slightly suffused; dististyle with two broad apical spines one of which has sinuous margins and the other notched and doubled *inconspicua*
5. Wing with a subapical infuscated band originating at or below apex of R4 and distad of fM 6
 - Wing otherwise marked 8
6. Infuscated area at fR small, nearly lining veins *districta*
 - Infuscated area at fR widespread 7
7. Subapical wing band very broad, dark markings through the anal-cubital area ... *ornata*
 - Subapical wing band about 3 times as long as wide, no dark markings in anal-cubital area *alacra*
8. Male dististyle with three long apical spines *trispina*
 - Male dististyle with two apical spines 9
9. Dististyle about 3 times as long as wide, curved 10
 - Dististyle about 1½ times as long as wide, subrectangular 11
10. No infuscation along R *elegans*
 - Wide infuscation along and above Rs *vishnui*
11. Infuscation at M and fM *lacustrina*
 - Infuscation at M, fM and base of M4 and at apex of R1+2+3, cells R5, M1 and extreme apex of M2 suffused *nepalensis*

KEY TO *MACROCERA* BASED ON KNOWN FEMALES

1. Wing plain, without infuscated pattern 2
 - Wing variously infuscated 3
2. Apex of wing suffused with a clear lighter band basad, an infuscated spot at the apex of R1+2+3 *simbhanjangana*
 - Wing clear, slightly yellowish, immaculate *inconspicua*
3. Wing with a subapical infuscated band originating at or below apex of R4 and distad of fM 4

- Wing otherwise marked 5
- 4. Subapical wing band very broad, dark markings through the anal-cubital area *ornata*
- Subapical wing band about 3 times as long as wide, no dark markings in anal-cubital area *alacra*
- 5. Apex of wing infuscated or heavily suffused 6
- Wing narrowly infuscated along costal margin 8
- 6. Dark apical area broadly margining wing to anal area *elegantula*
- Dark apical area reaching little, if any, beyond M4 7
- 7. Apical infuscated area mainly confined to cell R5 and less so in apex of cells R4 and M1, no infuscation between wing base and infuscated area that passes through the anastomosis *elegans*
- Heavily suffused broad, apical spot from cell R4 to or beyond M3, small species, Thailand *femina*
- 8. Wing with two infuscated spots along the costal area, unpigmented areas appearing between them *brunnea*
- Wing with four or five infuscated spots along the costal area, lightly pigmented area between these 9
- 9. Wing with four spots along costal area, no small infuscated spot above middle of Rs and little suffused posterior to M4 *flavicosta*
- Wing with five spots along costal area, a small infuscated spot above middle of Rs and infuscated at bend of M4 and Cu1 *alternata*

DEDICATION

This paper is dedicated to my old friend John Lane who helped to introduce me to the study of fungus gnats. The new genus *Laneocera* is named in his memory.

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