

TWO NEW SPECIES OF MOTH-FLIES,
GENUS *PSYCHODA* LATREILLE, FROM
NORTHERN PUEBLA, MEXICO (DIPTERA: PSYCHODIDAE)

SERGIO IBÁÑEZ-BERNAL
Laboratorio de Entomología,
Instituto Nal. de Diagnóstico y
Referencia Epidemiológicos, DGE.
Prolongación de Carpio 470
Col. Santo Tomás,
11340, México, D.F., MEXICO.

ABSTRACT

Two new species of *Psychoda* from northern Puebla, Mexico, are described and illustrated based on male and female characters. *Psychoda capitipenis* n. sp. belongs to the Alternata complex or to the genus *Tinearia* Schellemborg (sensu Jezek), whereas *Psychoda plumbea* n. sp. is similar to *P. cinerea*, *P. tothastica* and *P. elegans*. Both of them are considerably different from all other species of the genus previously described.

RESUMEN

Se describen e ilustran dos nuevas especies de *Psychoda* del norte de Puebla, México, basadas en los caracteres masculinos y femeninos. *Psychoda capitipenis* n. sp. pertenece al complejo Alternata o al género *Tinearia* Schellemborg (sensu Jezek), mientras que *Psychoda plumbea* n. sp. es similar a *P. cinerea*, *P. tothastica* y *P. elegans*. Ambas son considerablemente diferentes a todas las demás especies del género previamente descritas.

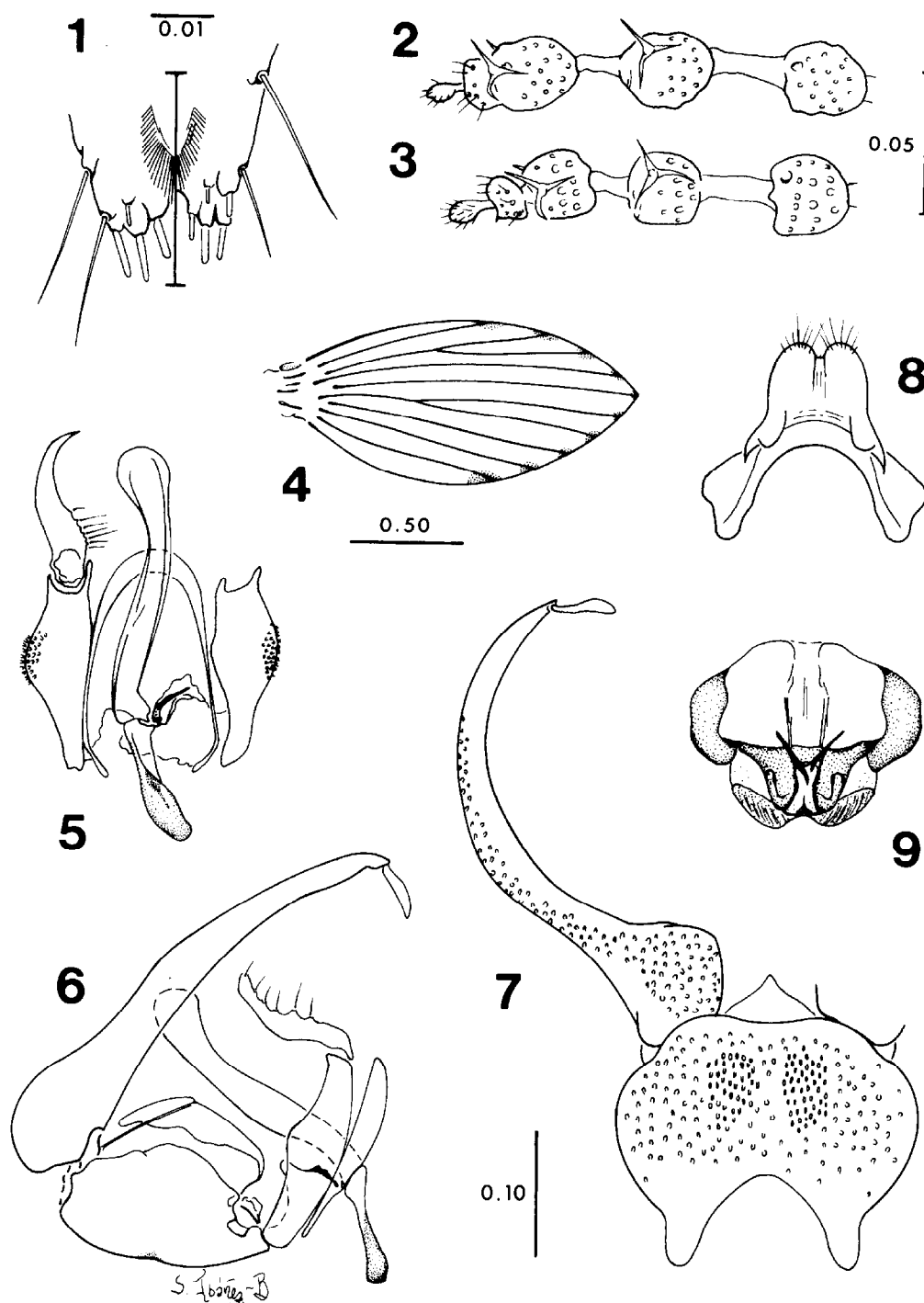
Only six species of the genus *Psychoda* Latreille (sensu Vaillant 1990) are known to occur in Mexico (Duckhouse 1973, Quate 1965, Vaillant 1973). Evidently, the small number of Mexican species known to date is a direct consequence of the lack of faunistic surveys, not of poor psychodid richness of the area. In this work, the original descriptions of two previously unknown species of *Psychoda* are presented and illustrated, based on the morphological characters of both sexes. All measurements are given in mm and read: mean \pm standard error (observed limits) n = number of observations.

Psychoda capitipenis Ibáñez-Bernal, new species
(Figs. 1-9)

MALE

General coloration bright pale yellow. Head vestiture bright pale yellow, except at vertex where each hair is more or less infuscated at tip. Foreleg with femur and tibia vestiture grayish; tarsomere 5 brown on all legs. Wing vestiture predominantly bright pale yellow over the veins, with some indefinite grayish areas and very evident dark brown patches at terminal portions of the main longitudinal veins, that of the cubital vein the largest.

Head: Eyes separated at narrowest distance by one-half to one facet diameter; eye-bridge with four rows of facets; interocular suture absent. Labellum flattened with one short preapical and three long apical blunt teeth and two spiniform setae (Fig. 1, left).



Figs. 1-9. *Psychoda capitipenis* n. sp. 1) Labellum; left, male; right, female. 2) Distal flagellomeres of male. 3) Distal flagellomeres of female. 4) Wing of male. 5-7) Male genitalia; 5) dorsal view of gonopods, shafts and adminiculum; 6) lateral view; 7) ventral aspect of ninth sternite and tenth tergites and surstyle. 8-9) Female genitalia. Figs. 5, 6, 7, 8 and 9 to same scale. All measurements in mm.

Palpus approximately 0.4 as long as antenna, proportion of segments 7.0: 8.0: 6.4: 8.8. Antenna with fifteen segments, about as long as wing width; ascoids composed of two anterior and one posterior branches, all branches short; scape about 1.2 as long as pedicel; first flagellomere with node twice as long as internode; following articles similar to first, but nodes progressively decreasing in size and internodes increasing in length to such an extent that node of flagellomere VII is as long as internode; flagellomere XI without internode; flagellomere XII smaller than the preceding and fused to it; flagellomere XIII small and pyriform with a thin pedicel, not fused to XII (Fig. 2).

Wing: Nearly twice as long as wide; Sc short, ending about level of base of R_1 ; proportion of R_{2+3} : R_3 = 7.0:10.0, M_{1+2} : M_2 = 6.0: 13.5; medial fork complete; CuA_2 ending distal to the level of forks of R_{2+3} and M_{1+2} (Fig. 4).

Genitalia: Inverted, asymmetrical, as in Figs. 5-7; surstyle long, a little longer than 2.0 times the greatest length of ninth tergite, with a single tenaculum, 0.13 as long as surstyle; ninth tergite with a deep proximal V-shaped cleft (Figs. 6, 7); gonocoxite a little longer than gonostyle, inflated at middle with alveoli of scales; gonostyle hirsute, curved. Main shaft apparently formed by the fusion of two shafts, nearly reaching the distal level of gonostyle, the apex globular; lateral shaft rudimentary. Aedeagus short, 0.5 as long as main shaft. Adminiculum diadem-like, lamina narrow (Figs. 5, 6).

Measurements: Head height (from lower margin of eyes to dorsal margin of vertex): 0.275 ± 0.01 (0.25-0.29) $n = 5$; proboscis length (from lower margin of eyes level to apex): 0.119 ± 0.01 (0.10-0.13) $n = 5$. Palpus length: 0.303 ± 0.01 (0.28-0.32) $n = 4$. Antenna length: 0.758 ± 0.047 (0.67-0.79) $n = 5$. Wing length: 1.76 ± 0.07 (1.62-1.80) $n = 5$; wing width: 0.70 ± 0.01 (0.67-0.72) $n = 5$. Foreleg length: 1.315 ± 0.07 (1.19-1.38) $n = 5$. Midleg length: 1.466 ± 0.07 (1.32-1.52) $n = 5$. Hindleg length: 1.564 ± 0.05 (1.47-1.60) $n = 5$. Surstyle length: 0.386 ± 0.01 (0.36-0.40) $n = 5$. Ninth tergite length at midline: 0.098 ± 0.01 (0.08-0.10) $n = 5$; lateral length: 0.175 ± 0.01 (0.16-0.18) $n = 5$. Gonostyle length 0.147 ± 0.01 (0.12-0.16) $n = 5$. Aedeagus and main shaft length: 0.285 ± 0.01 (0.27-0.31) $n = 5$.

FEMALE

Similar to male except for the following characteristics: One preapical short and four apical long blunt teeth and one pair of spiniform setae (Fig. 1, right). *Palpus* 0.4 as long as antenna; proportion of palpal segments: 7:7:5:8. *Antenna* slightly smaller than wing width (Fig. 3). *Wing:* proportion of R_{2+3} : R_3 = 7.5:11.5; M_{1+2} : M_2 = 7.0:13.5. *Genitalia* as in Figs. 8-9; subgenital plate with a middle-distal cleft about 0.25 as deep as the greatest length and two basilateral lobes; without genital digit.

Measurements: Head height: 0.29; proboscis length: 0.13. Palpus length: 0.30. Antenna length: 0.75. Wing length: 2.10; wing width: 0.82. Foreleg length: 1.32. Midleg length: 1.47. Hindleg length: 1.64. Cercus length: 0.24. Genital plate length at midline: 0.03, lateral: 0.05, basal width: 0.08.

IMMATURE STAGES

Unknown.

TYPES

Type locality: MEXICO; Puebla, Municipio de Xicotepec de Juárez, Carretera Xicotepec-Dos Caminos.

Holotype: Male. México, Puebla, Municipio Xicotepec de Juárez, carretera Xicotepec-Dos Caminos. 25-VIII-1990, S. Ibáñez-Bernal, col.

Allotype: female. Same data as holotype.

Paratypes: 11 males. Same data as holotype.

Resting adults were aspirated from underside of the leaves of Solanaceae in the margin of a pond; approximate elevation: 1,000 m.

Holotype, allotype and six paratypes mounted in Canada balsam on slides; three paratypes pinned; two paratypes in ethanol. Holotype, allotype and two paratypes deposited in the Arthropod Collection of the Laboratorio de Entomología, Instituto Nacional de Diagnóstico y Referencia Epidemiológicos (INDRE) (formerly: Instituto de Salubridad y Enfermedades Tropicales [ISET]). Two paratypes to be deposited in the Florida State Collection of Arthropods. Two paratypes to be deposited in the Walter Reed Biosystematic Unit, Museum Support Center; the rest of paratypes deposited in author's collection.

Etymology: from Latin capitis, head; penis, intromittent organ, referring to the capitae main shaft or globular apex of main shaft.

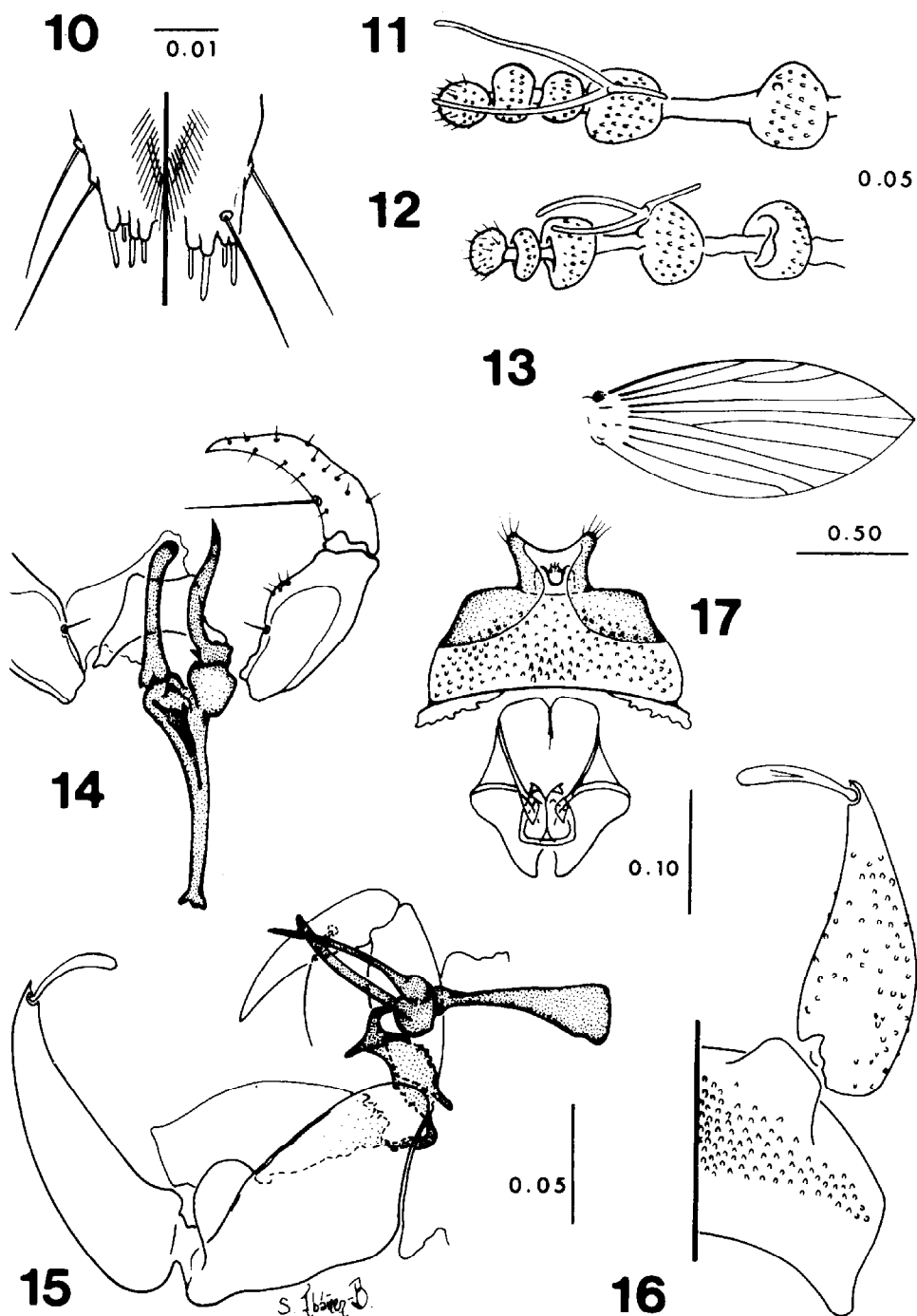
Comments: This species belongs to the *Alternata* complex of Quate (1955, 1955a) or to the genus *Tinearia* Schelleberg (sensu Jezek 1977) as indicated by the brown spots at the tips of main veins, the shape of the tip of the antenna and the small branches of the ascoids; the main shaft of male genitalia apparently formed by two elements and female without a genital digit. This complex is represented by *Psychoda alternata* Say, a cosmopolitan species, *P. alternicula* Quate, reported from Alabama, Florida, Georgia and Texas, *P. limicola* Vaillant in the United States, *P. lativentris* Berdén, present in North America and Europe and *P. pseudoalternata* Williams, apparently limited to the Hawaiian Islands. *P. capitipenis* new species, and these five species constitute an homogeneous group with some strong apomorphies, at least in the adult. Morphological studies of the known larvae do not support to date the reinstatement of the genus *Tinearia*, but it could be ultimately considered at least a subgenus. In this work the classification criterion of Vaillant (1990), which consider only the genus *Psychoda* in a broad sense, are follows. All the species of the complex are separable from each other by the shape of female subgenital plate and by some small differences of aedeagi of the male genitalia. The male of *P. capitipenis* has only four blunt teeth in all the specimens studied, differing at this respect of all other species of the complex which have five blunt teeth; in addition, the new species is unique in having the main shaft globular at the apex and the lateral shaft very reduced, not reaching the level of mid-portion of the main shaft. In the female, the genital plate is relatively simpler than in the other species of the complex, having the apex bilobate and with but two small rounded protuberances on basolateral corners. *P. capitipenis* and *P. alternata* are the only two species of the *Alternata* complex reported in Mexico. They are readily separable: the male of *P. alternata* has the basal portion of the main shaft longer than the distal portion, with the lateral shaft long, reaching the level of the main shaft apex; the female has the genital plate V-shaped.

Psychoda plumbea Ibáñez-Bernal, new species
(Figs. 10-17)

MALE

General vestiture lead-colored or silvery gray. Thorax a little paler than vertex; legs more infuscated. Integument dark brown.

Head: Eyes separated at narrowest distance by one facet diameter; eye-bridge with four rows of facets; without interocular suture. Labellum flattened with four long and one short apical blunt teeth and two spiniform setae (Fig. 10, left). Palpus about 0.33 as long as antenna, proportion of palpal segments 1.0: 1.22: 1.28: 1.55. Antenna with



Figs. 10-17. *Psychoda plumbea* n. sp. 10) Labellum; left, male; right, female. 11) Distal flagellomeres of male. 12) Distal flagellomeres of female. 13) Wing of male. 14-16) Male genitalia; 14) dorsal view of gonopods, shafts and adminiculum; 15) lateral view; 16) ventral aspect of ninth tergite and surstyle. 17) Female genitalia. Figs. 14, 15 and 16 to same scale. All measurements in mm.

sixteen segments, about 1.6 as long as wing width; ascoids with two long anterior and one short posterior branches, that of XIII segment with anterior branches reaching the antennal apex, posterior branch only reaching the basal margin of node (Fig. 11); scape about 1.33 as long as pedicel; first flagellomere with node as long as internode, following flagellomeres with node progressively decreasing in size and internodes increasing in length to such an extent that node of flagellomere VII is 0.65 as long as internode; flagellomere XI without internode; flagellomeres XII, XIII and XIV more or less of the same size, not fused (Fig. 11).

Wing: 2.3 as long as wide; Sc a little beyond basal level of R_1 ; proportions of $R_{2+3}:R_3 = 14:19$; $M_{1+2}:M_2 = 11:27$; medial fork complete (Fig. 13).

Genitalia: Inverted, asymmetrical, as in Figs. 14-16; surstyle short and pyriform, 1.6 as long as dorsal length of ninth tergite, with a single tenaculum, 0.3 as long as surstyle; ninth tergite subcuadrangular in dorsal view, with a shallow U-shaped basal cleft (Figs. 15, 16). Gonocoxite as long as gonostyle, a little inflated at middle and with a small alveoli patch; gonostyle with a long seta originated near the middle of the article on inner face. Main shaft nearly straight with rounded apex, 0.75 as long as aedeagus; lateral shaft sigmoidal in dorso-ventral view, sharp-pointed, as long as main shaft, but by position reaching well beyond the apical level of it; adminiculum reaching the apical third of gonocoxite in lateral view.

Measurements: Head height: 0.263 ± 0.009 (0.25-0.27) $n = 2$; proboscis length: 0.114 ± 0.0009 (0.10-0.12) $n = 2$. Palpus length: 0.322 ± 0.025 (0.30-0.34) $n = 2$. Antenna length: 1.036 ± 0.014 (1.02-1.04) $n = 2$. Wing length: 1.50 ± 0.042 (1.47-1.53) $n = 2$; wing width: 0.63. Foreleg length: 1.188 ± 0.10 (1.11-1.26) $n = 2$. Midleg length: 1.396 ± 0.006 (1.39-1.40) $n = 2$. Hindleg length: 1.442 ± 0.036 (1.41-1.46) $n = 2$. Surstyle length: 0.135; gonostyle length: 0.081; gonocoxite length: 0.081. Aedeagus length: 0.080 ± 0.0007 (0.080-0.081) $n = 2$; main shaft length: 0.062 ± 0.004 (0.059-0.066) $n = 2$; lateral shaft: 0.059 ± 0.009 (0.052-0.066) $n = 2$.

FEMALE

Similar to male except for the following features: *Palpus* about 0.4 as long as antenna; proportions of segments 1.0: 1.28: 1.28: 1.28. Antenna about 1.14 as wing width. *Wing* 2.5 as long as width; proportions of $R_{2+3}:R_3 = 6.5:9.0$; $M_{1+2}:M_2 = 4.5:13.0$. Genitalia as in Fig. 17; subgenital plate V-shaped, with a fold at each side; with a small genital digit.

Measurements: Head height: 0.25; proboscis length: 0.10. Palpus length: 0.32. Antenna length: 0.78. Wing length: 1.71; wing width: 0.68. Foreleg length: 1.14. Midleg length: 1.45. Hindleg length: 1.37. Cercus length: 0.17. Genital plate length at midline: 0.10, lateral: 0.12; basal width: 0.21.

IMMATURE STAGES

Unknown.

TYPES

Type Locality: México, Puebla, Municipio Xicotepec de Juárez, carretera Xicotepec-Dos Caminos.

Holotype: Male. México, Puebla, Mpio. Xicotepec de Juárez, Carretera Xicotepec-Dos Caminos, 25-VIII-1990, S. Ibáñez-Bernal, col.

Allotype: female; same data as holotype.

Paratypes: two males; same data as holotype.

The specimens were collected on pond riparian Solanaceae, adults aspirated from underside of leaves. Approximate site elevation: 1,000 m.

This species shared the under-leaf surface with *Psychoda capitipenis* new species. Holotype, allotype and one paratype mounted in Canada balsam; one paratype pinned.

Holotype and allotype deposited in Arthropod Collection of Laboratorio de Entomología, Instituto Nacional de Diagnóstico y Referencia Epidemiológicos (INDRE), México, D.F. Other specimens deposited in author's collection.

Etymology: From latin *plumbea*, lead-colored.

Comments: The presence of sixteen antennal segments, the distal three flagellomeres distinctly separated from each other and subequal in size and the four rows of facets, place this new species nearest to *P. cinerea* Banks, *P. elegans* Kincaid, and *P. tothastica* Quate. However, it is readily separable from them by only two spiniform setae in the labellum. The male genitalia are very similar to those of *P. thrinax* Quate, but the last have the median extension with three rows of facets, three spiniform setae, the lateral shaft arcuate, reaching the level of main shaft apex, and in the female the genital plate wider at apical portion and a biggest genital digit. *P. tothastica* differs from the new species by the presence of three spiniform setae in the labellum, male genitalia with the lateral shaft not reaching the level of the apex of the main shaft, and in the female genitalia by the distal portion of genital plate quadrate. All of the species mentioned have been recorded in Mexico (Rosario 1936, Quate 1955, Duckhouse 1973).

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