

**LETHAEINI (HEMIPTERA: LYGAEOIDEA: RHYPAROCHROMIDAE)
ASSOCIATED WITH FIGS IN MEXICO, WITH THE DESCRIPTION OF A
NEW SPECIES OF *CISTALIA***

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Abstract.—Descriptions and illustrations of some Lethaeini associated with *Ficus* spp. in Mexico are presented. Notes on the biology of *Cistalia pallidifemur* Cervantes and Gamez, *Cryphula apicata* (Distant), *C. trimaculata* (Distant), *Neopetissius slaterorum* O'Donnell, *Paragonatas costaricensis* Distant, *P. divergens* Distant, and *Petissius spinipes* (Stål), and their distribution, mainly within the Mexican Gulf Coast region, are included. *Cistalia pallidifemur*, n. sp., is described and illustrated. All species included in this study are considered facultative seed predators of figs.

Key Words: *Cistalia*, *Ficus*, Lethaeini, Mexico

Members of Lethaeini are normally small in size, with a shining to subshining dorsal surface. They are separated from other rhyparochromid tribes by the following synapomorphies: linear placement of trichobothria on abdominal sternum V, loss of y-chromosome, extreme modification of the sperm reservoir, and development of iridescent head areas (Slater and O'Donnell 1978, O'Donnell 1991). Nymphs lack a Y-suture but have lateral evaporative areas. In most genera, there is a conspicuous trichobothrium present near each anterolateral pronotal angle (Slater and Baranowski 1990, Schuh and Slater 1995). Very little is known about the biology of Lethaeini. Sweet (1964) reported *Cryphula trimaculata* Distant as a ground-litter inhabitant of long-lasting old fields vegetated with perennial bunch grasses. It definitely prefers to feed on seeds of *Panicum* spp. but it also feeds on seeds of fescue, millet, and strawberry. Slater (1972) found that several species of *Neolethaeus* in South Africa were obligatory terrestrial and facultative terres-

trial seed predators, mainly of *F. sycomorus* L. and *F. capensis* Thunb. Baranowski and Slater (1979) described the biology of *Cryphula affinis* (Distant) and *C. bennetti* Baranowski and Slater in Trinidad, where both species were found under *Stachytarphaeta jamaicensis* (L.) Vahl. (Verbenaceae). They mentioned that although both species were found in the same area, they were usually in different microhabitat conditions, with *C. affinis* preferring relatively moister situations. Slater and Baranowski (1990) reported *Cistalia signoreti* (Guérin), *Cryphula trimaculata* (Distant), *Paragonatas costaricensis* (Distant), and *P. divergens* (Distant) from Florida. They recounted what Sweet mentioned about the biology of *C. trimaculata* and pointed out that *P. divergens* was found in temporary early succession stages of old-field habitats and apparently fed on a variety of seeds. Nymphs of 1st, 4th, and 5th instars of *C. signoreti* have been described (Slater and Baranowski 1973). Baranowski and Slater (1979) described all immature instars of *Cryphula bennetti* Bar-

anowski and Slater and *C. affinis* (Distant). O'Donnell (2001), while describing the genus *Neopetissius*, found that most of the material has been collected at light, although she had records of *N. slaterorum* O'Donnell found in litter of *Ficus* sp.

Here we describe the biology of six Leptaeini that are associated with several species of figs, and include descriptions of some nymphal stages of *Cistalia pallidifemur*, n. sp., *C. trimaculata*, *N. slaterorum*, *P. divergens*, and *Petissius spinipes* Stål. The description of a new species and the distribution of all species within Mexico also are given.

MATERIAL AND METHODS

Monthly collecting trips between 2001 and 2003 were made to several localities in the Mexican states of Campeche, Tamaulipas, and Veracruz. The objective was to collect lygaeoids associated with wild, fruiting fig trees.

Around 30 fig species were sampled from localities from sea level to an altitude of 1,500 m. Several types of vegetation were included: low tropical dry forest, medium tropical forest, high tropical rain forest, and cloud forest. The methodology followed is described in detail in Cervantes et al. (2004). Measurements are given in mm \pm 1SD.

Additional data of their distribution in Mexico is also reported, based on specimens deposited in Coleccion Nacional de Insectos from Instituto de Biologia, Universidad Nacional Autonoma de Mexico (CNIN) and based on Slater and Brailovsky (2000). Voucher specimens and nymphs have been deposited at Coleccion Entomologica del Instituto de Ecologia, A.C. Xalapa, Veracruz, Mexico (IEXA). Other abbreviations used are BMNH, The Natural History Museum, London, U.K., and AMNH, American Museum of Natural History, New York, NY, USA. Deposition of the specimens of the new species described here are listed in the description of the species.

RESULTS

Cistalia pallidifemur Cervantes and Gámez, new species (Figs. 1A–C, 2A–D)

Diagnosis.—Dorsal and ventral surfaces of head and antennal segments I, II, and IV dark brown. Femora with basal two-thirds pale yellow and apical third pale brown. Head covered with small semierect hairs and dorsal surface covered with small silvery hairs. Parameres with sides of blade smooth.

Adult (Fig. 1C).—Body slightly elongated with parallel margins. Head, pronotum, scutellum, clavus, chorion, ventral surface, and antennal segments I, II, and IV dark brown. Dorsal and ventral surfaces of head covered by small semierect hairs, with dorsal hairs slightly longer; eyes reddish brown and ocelli yellowish brown; antennal segment III with basal third dark brown, remainder pale yellow. Rostrum pale brown, reaching mesocoxae. Lateral pronotal margins with sparse long hairs; dorsal surface covered by small silvery hairs; anterior pronotal margin slightly concave and posterior pronotal margin straight; lateral pronotal margins weakly rounded; anterior lobe impunctate, and posterior lobe with small punctures. Coxae and trochanters pale brown, femora with basal two-thirds pale yellow and apical third pale brown; tibiae and tarsi yellowish brown; fore femur with a series of hairs along inner margins; tibiae with long, widely-spaced spines. Evaporative area rough, with peritreme orange brown. Scutellum, clavus, and chorion covered by small decumbent hairs; scutellum with small punctures, clavus and chorion with larger punctures forming rows. Hemelytral membrane smoky. Ventral abdominal surface covered with short hairs, but with several long setae along middle.

Male genitalia: Parameres sickle shaped with sides of blade smooth (Fig. 2C).

Male measurements (n = 10): Body length 5.57 ± 0.09 ; head length 0.64 ± 0.1 ; width through eyes 1.06 ± 0.05 ; interocular

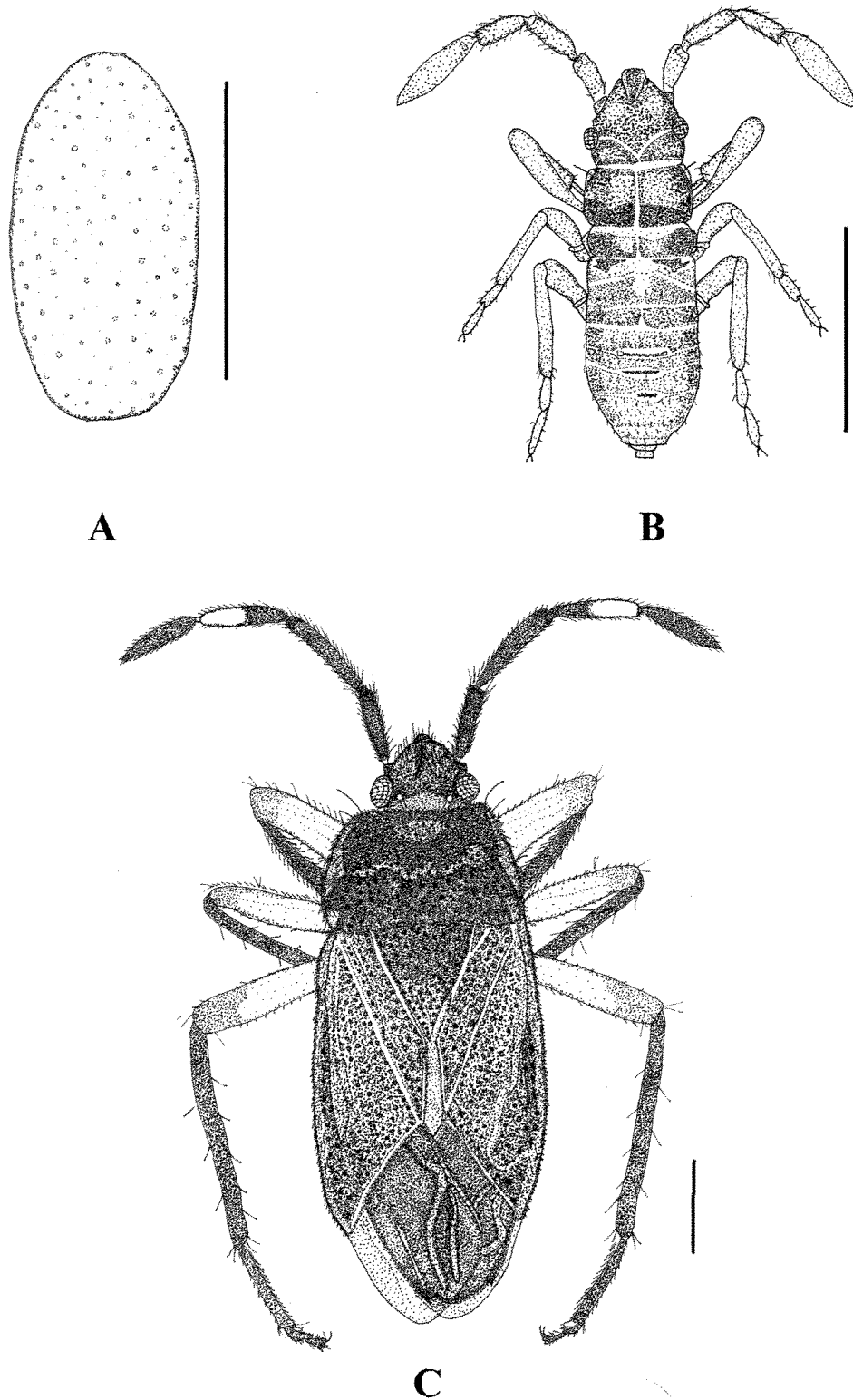


Fig. 1. *Cistalia pallidifemur*. A, Egg. B, First instar. C, Adult. Scale = 1 mm.

distance 0.56 ± 0.04 ; interocellar distance 0.39 ± 0.2 ; postocular distance 0.06 ± 0.2 ; antennal segment lengths: I 0.68 ± 0.04 , II 0.99 ± 0.3 , III 0.89 ± 0.03 , IV 0.91 ± 0.07 ; rostral segment lengths: I 0.72 ± 0.03 , II 0.73 ± 0.04 , III 0.66 ± 0.05 , IV 0.42 ± 0.05 ; pronotum: length 1.11 ± 0.07 , width across humeral angles 1.97 ± 0.07 , width across anterior margin 1.3 ± 0.09 ; scutellum: length 1.18 ± 0.06 , width 1.01 ± 0.07 ; fore leg: femur length 1.45 ± 0.07 , tibia length 1.38 ± 0.08 , tarsomere lengths: I 0.53 ± 0.4 , II 0.14 ± 0.2 , III 0.2 ± 0.02 .

Female measurements (n = 10): Body length 5.95 ± 0.3 ; head length 0.65 ± 0.09 ; width through eyes 1.09 ± 0.02 ; interocular distance 0.59 ± 0.02 ; interocellar distance 0.41 ± 0.02 ; postocular distance 0.07 ± 0.04 ; antennal segment lengths: I 0.69 ± 0.03 , II 1.01 ± 0.07 , III 0.88 ± 0.04 , IV 0.96 ± 0.5 ; rostral segment lengths: I 0.74 ± 0.04 , II 0.76 ± 0.06 , III 0.65 ± 0.06 , IV 0.44 ± 0.04 ; pronotum: length 1.17 ± 0.08 , width across humeral angles 2.06 ± 0.14 , width across anterior margin 1.3 ± 0.08 ; scutellum: length 1.21 ± 0.1 , width 1.16 ± 0.13 ; fore leg: femur length 1.46 ± 0.08 , tibia length 1.45 ± 0.08 , tarsomere lengths: I 0.52 ± 0.03 , II 0.17 ± 0.02 , III 0.21 ± 0.01 .

Types.—Holotype: male, MEXICO, VERACRUZ, San Andres Tuxtla, Estacion Biologica Los Tuxtlas, 12.XI.2001, light traps, A. Sanchez (IEXA). Paratypes: MEXICO: CAMPECHE: Escarcega, 4.VI.1982, O. Canul, 2 ♂ (CNIN); km 78 Escarcega-Xpuhil, 31.V.2001, light traps, L. Cervantes, C. Mayorga, 1 ♂ (IEXA). CHIAPAS: Agua Azul, 22.V.1979, L. Rivera, 1 ♀; Km 9 Palenque-Ocozingo, 5.V.1982, V. Melendez, 2 ♂, 2 ♀, A. Ibarra, 1 ♂, 1 ♀; km 7 Tapachula-Talisman, Finca Chinita, 20.IV.1983, H. Brailovsky, 1 ♂; Tapachula-Huixtla, 26.XII.1985, H. Velasco, 1 ♂. OAXACA: San Pedro Juchatengo, 12.VII.04, L. Cervantes, A. Delgado, C. Mayorga, 1 ♂, 1 ♀ (CNIN). PUEBLA: San Diego, 13.VI.1953, H. Brailovsky, 1 ♂; Tenango de Doria, 5.II.1986, H. Brailovsky,

E. Barrera, 1 ♂, 2 ♀; Yohualichan, 7.II.1986, E. Barrera, 1 ♀; Km 10 Xicotepec-Patla, 2.VII.1994, G. Ortega, E. Barrera, 1 ♂. QUERETARO: Chuvuje, 21.VI.1998, L. Cervantes, G. Ortega, 1 ♂, 5 ♀; km 8 Neblinas-Agua Zarca, 19.VIII.1998, H. Brailovsky, E. Barrera, 2 ♀. QUINTANA ROO: Felipe Carrillo Puerto, Buenavista, 22.VI.1989, A. Cadena, L. Cervantes, 1 ♀ (CNIN). VERACRUZ: San Andres Tuxtla, Estacion Biologica Los Tuxtlas, 12.XI.2001, light traps, A. Sanchez, 1 ♀ (IEXA); 14.V.1985, L. Cervantes, 1 ♂; 17.V.1985, L. Cervantes, 2 ♂; 18.V.1985, L. Cervantes 1 ♂, 1 ♀; 19.V.1985, L. Cervantes, 1 ♀; 20–26.VII.1985, E. Ramirez, 1 ♀; 28.VII.1985, C. Mayorga, 1 ♂, 1 ♀; 30.VII.1985, C. Mayorga, 1 ♂, 1 ♀; 24.VIII.1985, C. Mayorga, 1 ♀; V. Melendez, 1 ♂; 29.VIII.1985, C. Mayorga, 1 ♀; 30.VIII.1985, C. Mayorga, 1 ♂; 1–10.IX.1985, A. Ibarra, 1 ♀; 11.IX.1985, E. Ramirez, 1 ♀; 6.X.1985, C. Mayorga, V. Melendez, 1 ♂, 2 ♀ (CNIN); 16.IX.1987, F. Arias, 3 ♀ (BMNH); 17.IX.1987, F. Arias, 4 ♂, 3 ♀ (AMNH); 17.IX.1988, C. Mayorga, 1 ♀; 13–20.XI.1988, E. Mejorada, 1 ♂; 6.IX.1989, J.L. Colin, 1 ♀; 12.IX.1989, J.L. Colin, H. Rojas, 1 ♂ and 1 ♀; 18.IX.1989, J.L. Colin, H. Rojas, 1 ♂; 20.IX.1989, J.L. Colin, H. Rojas, 1 ♀; 6.X.1989, J.L. Colin, H. Rojas, 1 ♀; 31.X.1989, J.L. Colin, H. Rojas, 1 ♂, 1 ♀ (CNIN); 11.XI.1989, J.L. Colin, H. Rojas, 2 ♀ (NMNH); 1–3.IV.1993, H. Brailovsky, 1 ♂, 1 ♀; San Andres Tuxtla, 8.XI.1977, H. Brailovsky, 1 ♀; San Andres Tuxtla, Km 3 Estacion los Tuxtlas-Catemaco, 2.XII.2001, under *Ficus insipida* Willd., A. Sanchez, L. Cervantes, 3 ♀; San Andres Tuxtla, Ejido Lazaro Cardenas, 12.VII.1989, J.L. Colin, H. Rojas, 4 ♂, 3 ♀; Nanchital, 5.X.1976, light traps, H. Brailovsky, 1 ♂; Rio Maquinas, 17.VII.1991, E. Mejorada, B. Arellano, 1 ♀ (CNIN); Jalcomulco, 3.XII.1999, L. Cervantes, 1 ♂, 1 ♀; Misantla, km 18 Misantla-Juchique, 26.I.2002; under *Ficus pertu-*

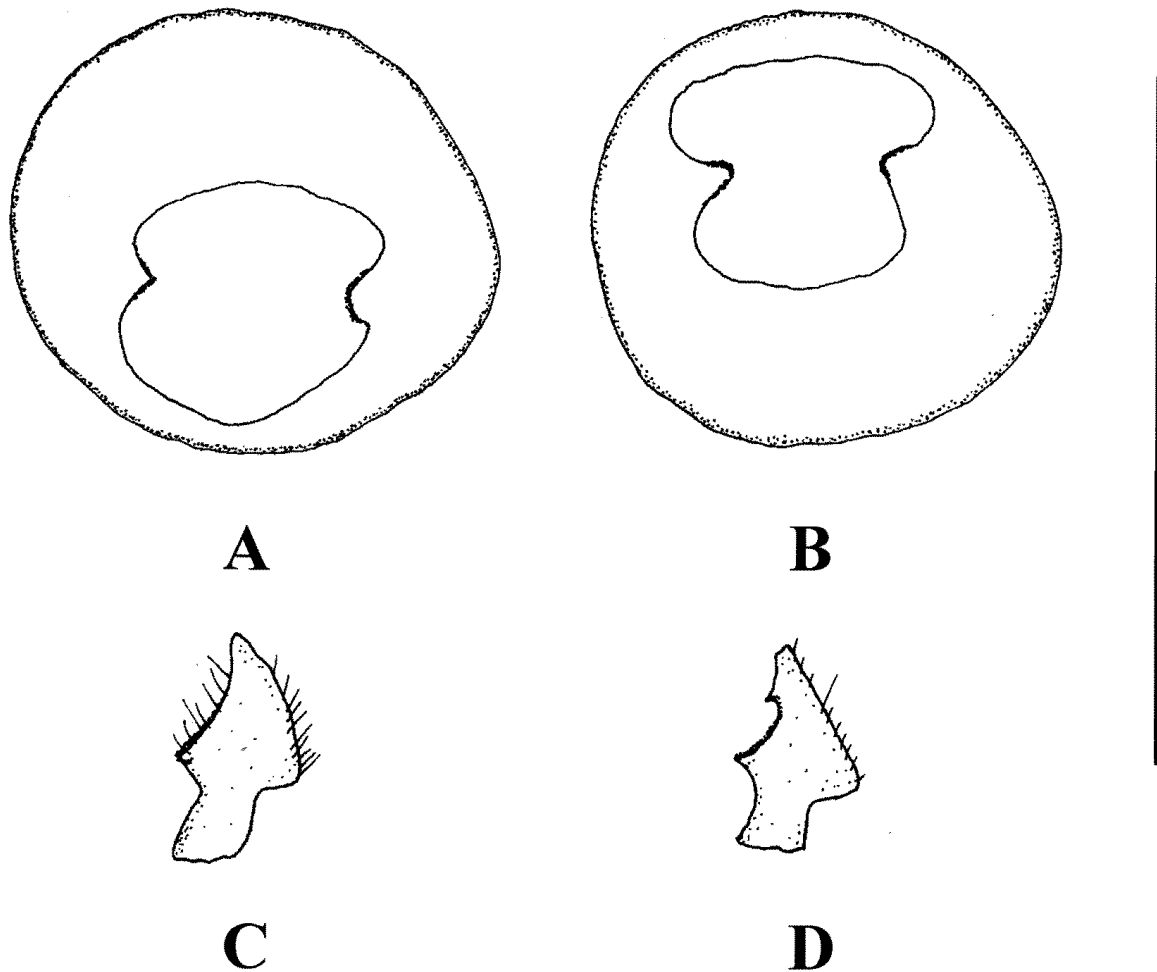


Fig. 2. A, Pygophore of *Cistalia pallidifemur*. B, Pygophore of *C. explanata*. C, Paramere of *C. pallidifemur*. D, Paramere of *C. explanata*. Scale = 1 mm.

sa L., I. Pacheco, L. Cervantes, 1 ♀ (IEXA).

Discussion.—This species differs from *C. explanata* in the form of the parameres. In *C. explanata* the blade has a small spine on the inner side (Fig. 2D), whereas the pygophores of both are very similar (Figs. 2A–B). *Cistalia pallidifemur* differs from *C. explanata* by the general coloration of the femora; *C. explanata* has all femora from pale brown to brown, while *C. pallidifemur* has the basal two-thirds pale yellow and the apical third brown.

In Slater and Baranowski's key (1973), *C. pallidifemur* will run to *C. alboannulata* and *C. neotropicalis*, because it has slightly more than half of the third antennal seg-

ment pale, although it is never more than three-quarters pale.

Etymology.—Named for the pale basal two-thirds of the femora.

Distribution.—MEXICO: Campeche, Chiapas, Puebla, Queretaro, Quintana Roo, and Veracruz.

Egg (Fig. 1A) ($n = 7$).—Oval, pale yellow, chorium surface smooth, with irregular distributed small punctures. 1.22 ± 0.03 mm long by 0.57 ± 0.04 mm wide.

First instar (Fig. 1B).—Head, pro-, and mesonota pale brown, pro- and mesonota with small pale yellow punctures irregularly distributed; eyes red; antennal segments brownish gray, with intersegmental unions pale yellow with reddish areas; margins of

segments II and III dark brown. Rostrum pale brown. Metanotum pinkish, with lateral margin pale brown; thoracic pleurae brown; legs pale yellow; abdominal segments I to III redish, rest of abdomen pinkish. Rostrum extending beyond metacoxae. Scent glands present as brown bands on abdominal segments III–IV, IV–V, and V–VI. Dorsal and ventral surface of abdomen covered by small decumbent hairs. Three small brownish gray plates present on ventral middle line of segments VII–IX. Measurements ($n = 4$). Body length 1.75 ± 0.21 ; head length 0.39 ± 0.08 ; width through eyes 0.49 ± 0.02 ; interocular distance 0.34 ± 0.02 ; postocular distance 0.07 ± 0.06 ; antennal segment lengths: I 0.23 ± 0.02 , II 0.25 ± 0 , III 0.22 ± 0.03 , IV 0.44 ± 0.02 ; rostral segment lengths: I 0.34 ± 0.02 , II 0.31 ± 0.02 , III 0.22 ± 0.03 , IV 0.25 ± 0.04 ; pronotum: length 0.25 ± 0 , width across humeral angles 0.52 ± 0.03 , width across anterior margin 0.423 ± 0.03 ; fore leg: femur length 0.46 ± 0.06 , tibia length 0.46 ± 0.05 , tarsomere lengths: I 0.14 ± 0.02 , II 0.2 ± 0.01 .

Biology.—*Cistalia pallidifemur* was collected in leaf litter of *Ficus insipida* Willd. and *F. pertusa* L. (Moraceae), throughout the year. Individuals usually run under the dead leaves, feeding on seeds of fallen fruits. This species also was collected at light traps.

Cryphula apicata (Distant)
(Fig. 3)

Adult (Fig. 3).—3.5 mm long. Pronotum and scutellum shiny black; pronotum with lateral margins emarginated; posterior margin of pronotum with pale areas. Scutellum with only apex ochraceous; antennal segments brown, with segments I and II slightly paler; antennal segment II longest; third and fourth subequal, segment III with apex grayish.

Biology.—This species was collected only under *Ficus calyculata* Mill. Individuals were found running on the ground under the leaf litter.

Distribution.—MEXICO: Guerrero, Puebla, Tamaulipas.

Cryphula trimaculata (Distant)
(Figs. 4A–D)

Adult (Fig. 4D).—Small, 3.0–4.0 mm long. Body shiny, dark castaneous brown. First and second antennal segments ochraceous, third and fourth brown. Anterior portion of pronotum impunctate and black, posterior part closely punctate and ochraceous. Pronotal humeral angles with three spots, on scutellum and some veins of hemelytra pale yellow. Corium ochraceous, coarsely punctate; membrane dark brown, with apex hyaline. Legs ochraceous.

Second instar (Fig. 4A).—Body pyriform with maximum width through abdominal segment V. Head brown, with darker areas around each eye. Pro- and mesonota dark brown, two pale yellow maculae on mesonotum, one on each side of middle line; metanotum pale brown. Eyes red. Antennal segments I and II pale yellow, segment III brown, and segment IV brown and darkest. Labium and legs pale yellow; femora and apex of labium brownish. Thoracic pleurae brown. Abdomen yellowish with red transverse lines. Scent gland plates between segments III–IV, IV–V, and V–VI, but only first and second scent gland openings visible. Tylus half as long as antennal segment I. Rostrum reaching middle of metacoxae. Apex of tylus with a few short hairs. Pronotum with one tricobothrium at each anterolateral margin. Trichobothria present on abdominal segments II to VIII. Ventral plates present on midline of segments VI–IX. Abdominal venter covered by small brown setae. Hind tibia with spinelike setae only at apex, and middle tibia with more evenly distributed spinelike setae. Measurements ($n = 1$). Body length 2.15; head length 0.375; width across eyes 0.475; interocular distance 0.35; postocular distance 0.125; antennal segment lengths: I 0.2, II 0.2, III 0.275, IV 0.425; rostral segment lengths: I 0.25, II 0.25, III 0.275, IV 0.2; pronotum length 0.3; width across humeral

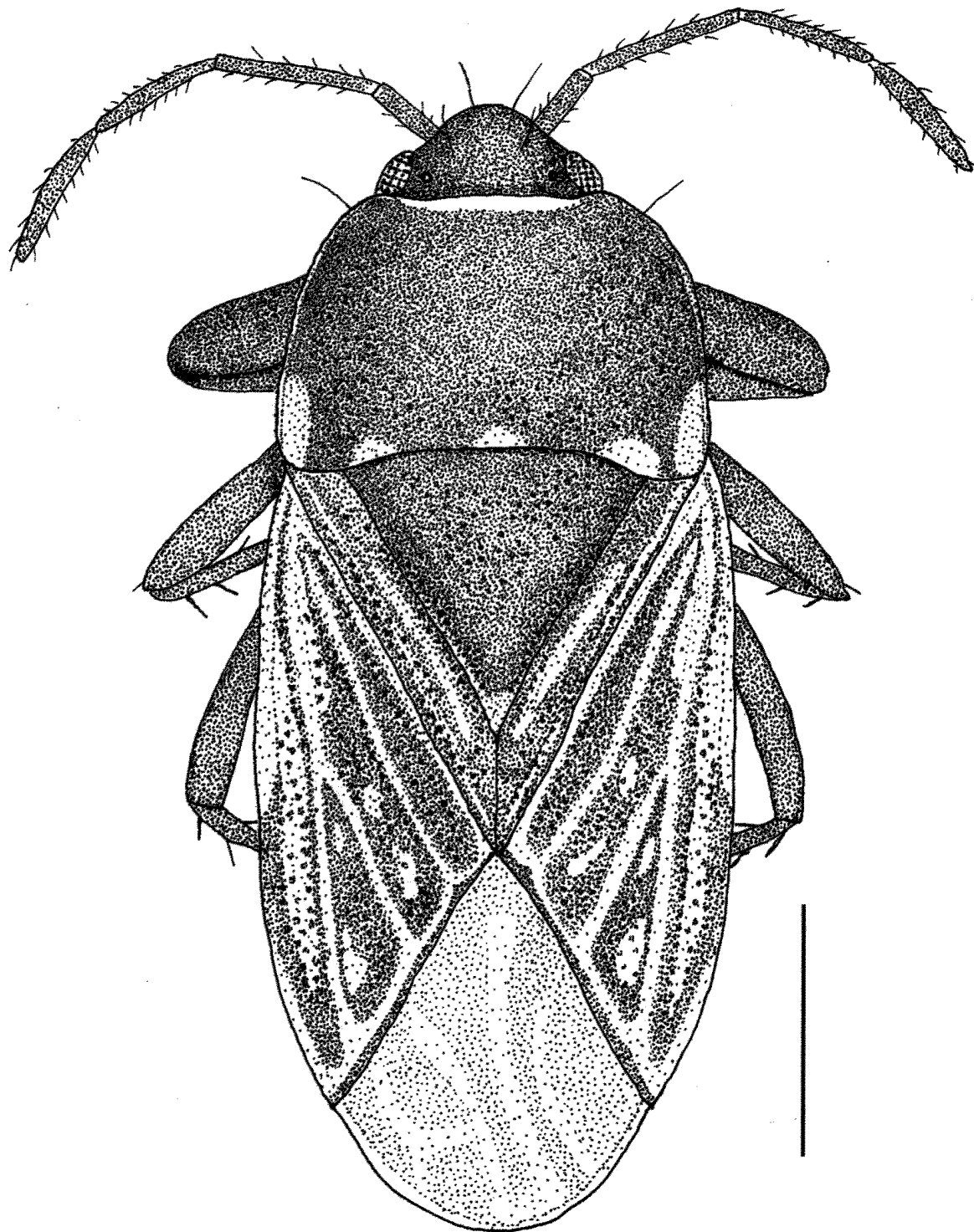


Fig. 3. *Cistalia apicata*. Adult. Scale = 1mm.

angles 0.55; width across anterior margin 0.55; fore leg: femur length 0.45; tibia length 0.35; tarsomere lengths: I 0.1, II 0.175.

Fourth instar (Fig. 4B).—Body slightly elongated. Head pale brown with base slightly paler. Eyes red. Antennal segments I–III pale yellow with bases and apices

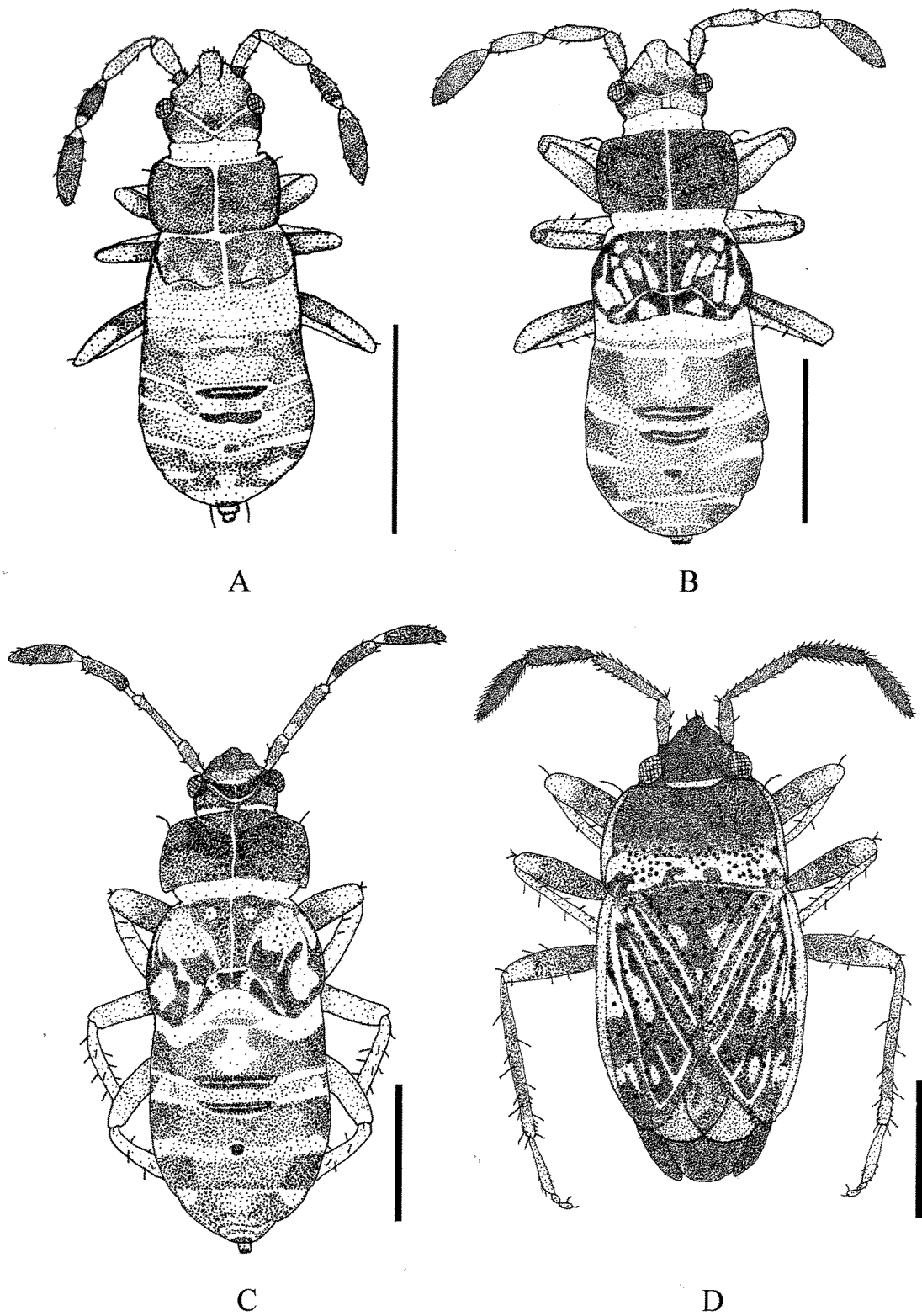


Fig. 4. *Cryphula trimaculata*. A, Second instar. B, Fourth instar. C, Fifth instar. D, Adult. Scale = 1 mm.

white; segment IV brown with white base. Labial segments I–III, tibiae, and tarsi pale yellow; labial segment IV and femora pale brown. Pronotum and thoracic pleurae brown; meso- and metanota mixed with irregular brown and pale yellow areas: scutellar area with dark brown punctures. Abdomen reddish with pale yellow bands along segment unions. Plates of scent gland openings very similar to second instar. Lateral margins of abdomen slightly darker. Two pairs of tricobothria situated in front of eyes. Labium reaching base of mesocoxae. Fore tibia with numerous spinelike setae. Fore femur sulcate, and with four or five small spines on internal margin. Mesothoracic wing pads covering 4/5 of metanotum. Measurements ($n = 3$). Body length 2.87 ± 0.15 ; head length 0.53 ± 0.04 ; width across eyes 0.58 ± 0.02 ; interocular distance 0.37 ± 0.01 ; postocular distance 0.21 ± 0.04 ; antennal segment lengths: I 0.25 ± 0.05 , II 0.35 ± 0.05 , III 0.33 ± 0.03 , IV 0.46 ± 0.01 ; rostral segment lengths: I 0.34 ± 0.05 , II 0.35 ± 0 , III 0.28 ± 0.02 , IV 0.28 ± 0.03 ; pronotum length 0.43 ± 0.04 ; width across humeral angles 0.75 ± 0.09 ; width across anterior margin 0.6 ± 0.05 ; fore leg: femur length 0.57 ± 0.03 ; tibia length 0.55 ± 0.5 ; tarsomere lengths: I 0.19 ± 0.01 , II 0.19 ± 0.01 .

Fifth instar (Fig. 4C).—Very similar to fourth instar, except pronotum and thoracic pleurae slightly paler. Mesothoracic wing pads almost all pale yellow with margins pale brown. Punctures of meso- and metanota more numerous. Coxae with two or three spinelike setae. Spines of fore femur thicker. Measurements ($n = 10$). Body length 3.57 ± 0.31 ; head length 0.55 ± 0.04 ; width across eyes 0.742 ± 0.03 ; interocular distance 0.45 ± 0.01 ; postocular distance 0.14 ± 0.07 ; antennal segment lengths: I 0.29 ± 0.03 , II 0.51 ± 0.03 , III 0.45 ± 0.04 , IV 0.56 ± 0.04 ; rostral segment lengths: I 0.45 ± 0.04 , II 0.47 ± 0.03 , III 0.42 ± 0.04 , IV 0.3 ± 0.04 ; pronotum length 0.61 ± 0.05 ; width across humeral

angles 1.11 ± 0.07 ; width across anterior margin 0.8 ± 0.02 ; scutellum length 0.56 ± 0.05 ; scutellum width 0.64 ± 0.06 ; fore leg: femur length 0.73 ± 0.06 ; tibia length 0.74 ± 0.05 ; tarsomere lengths: I 0.22 ± 0.02 , II 0.25 ± 0.02 .

Biology.—In this species, macropterous forms are present; however, brachypterous forms are more abundant. *Cryphula trimaculata* was collected in leaf litter of *Ficus cotinifolia* Kunth., *F. perforata* L., *F. pertusa*, *F. tecolutensis* (Liebm.) Miq., and *F. trigonata* L., during February, March, April, and August. Nymphs were collected only on *F. pertusa* and *F. tecolutensis*. Both adults and nymphs live under the first layers of litter, very close to the ground, hiding in crevices. They seem to prefer dry ground conditions with little leaf litter. This species also was found close to perennial grasses that grow in clumps.

Distribution.—MEXICO: Baja California, Jalisco, Morelos, Tamaulipas, and Veracruz.

Neopetissius slaterorum O'Donnell
(Figs. 5A–B)

Adult.—Head dark brown; anterior pronotal lobe, almost all scutellum, and macula on corium dark brown; irregular macula on posterior pronotal lobe and apex of scutellum reddish brown; two elevated areas of scutellum, and some areas of posterior pronotal lobe pale yellow. One macula on each side of middle line just above pronotal collar, lateral pronotal margins, humeral angles, and claval suture cream. Distal third of antennal segment III white, remainder pale brown. Femora amber, with distal end paler; tibiae and tarsi pale yellow. Adult illustrated by O'Donnell (2001).

Fourth instar (Fig. 5A).—Pyriform. Head brownish orange; eyes red; antennal segment I brownish yellow; base of segment II brownish yellow, rest dark brown; segment III dark brown; base of segment IV dark brown, rest brownish yellow. Rostrum brownish yellow, apex of segment IV dark brown. Pro-, meso-, and metanota mixed

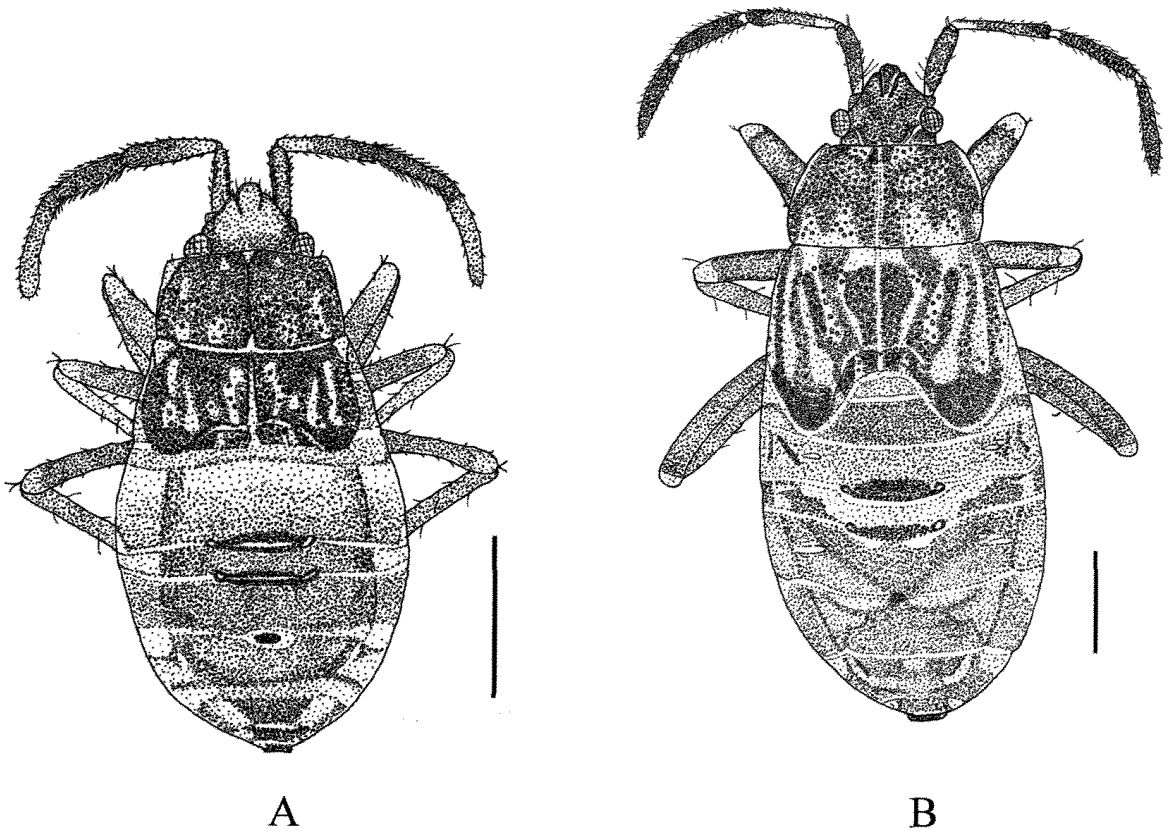


Fig. 5. *Neopetissius slaterorum*. A, Fourth instar. B, Fifth instar. Scale = 1 mm.

with dark brown and brownish orange areas, with irregularly distributed dark brown punctures. Thoracic pleurae brownish orange; femora brownish yellow; tibiae and tarsi pale yellow. Abdomen grayish, with red bands near lateral margins; intersegmental unions pale yellow. Abdominal scent glands dark brown, situated between segments III–IV, IV–V, and V–VI. Four small, dark brown plates ventrally on middle line of segments VI–IX. Antennal segments covered by small hairs, been more abundant on segment III. Rostrum reaching base of abdominal segment III. Mesothoracic wing pads covering almost all metanotum. Fore femur with a row of five or six small spines on internal margin. Middle and hind tibiae with long spines irregularly distributed. Abdominal scent glands only functional on segments III–IV and IV–V; gland one on segments V–VI without openings. Measurements ($n = 1$). Body length 3.5; head length 0.3; width through eyes 0.8; in-

terocular distance 0.5; postocular distance 0; antennal segment lengths: I 0.45, II 0.6, III 0.5, IV 0.75; rostral segment lengths: I 0.6, II 0.7, III 0.6, IV 0.4; pronotum: length 0.5, width across humeral angles 1.1, width across anterior margin 0.9; fore leg: femur length 0.9, tibia length 0.9, tarsomere lengths: I 0.1, II 0.2.

Fifth instar (Fig. 5B).—Pyriform. Very similar to fourth instar. Head brownish orange, although a few individuals with darker areas. Antennal segments I and II brown, segment II with a small basal yellow area; segments III and IV dark brown. Dark brown and brownish-orange areas of pro-, meso-, and metanotum defined as longitudinal bands; almost all dark brown punctures situated over dark brown bands. Mesothoracic wing pads reaching base of abdominal segment III. Measurements ($n = 4$). Body length 6.48 ± 0.43 ; head length 0.72 ± 0.03 ; width through eyes 1.15 ± 0.1 ; interocular distance 0.74 ± 0.05 ; inter-

ocellar distance 0.61 ± 0.02 ; postocular distance 0.1 ± 0 ; antennal segment lengths: I 0.69 ± 0.08 , II 1.02 ± 0.05 , III 0.89 ± 0.06 , IV 1.08 ± 0.05 ; rostral segment lengths: I 0.98 ± 0.05 , II 1.02 ± 0.05 , III 1.09 ± 0.12 , IV 0.51 ± 0.06 ; pronotum: length 1.01 ± 0.06 , width across humeral angles 2.02 ± 0.12 , width across anterior margin 1.25 ± 0.04 ; fore leg: femur length 1.34 ± 0.12 , tibia length 1.41 ± 0.08 , tarsomere lengths: I 0.38 ± 0.06 , II 0.41 ± 0.02 .

Biology.—*Neopetissius slaterorum* was collected in the litter of *Ficus colubrinae* Standl., *F. cotinifolia*, *F. insipida*, *F. ovalis* (Liebm.) Miq., *F. perforata*, *F. trigonata*, and *F. yoponensis* Desv. throughout the year. As with many other Lethaeini reported in this work, adults of this species usually run under leaf litter just above the soil surface, hiding under twigs or in crevices. This species was also attracted to light traps.

Distribution.—MEXICO: Campeche, Chiapas, Guerrero, Jalisco, Oaxaca, Puebla, Quintana Roo, San Luis Potosi, Tamaulipas, Tlaxcala, Veracruz, and Yucatan.

Paragonatas costaricensis (Distant)
(Fig. 6)

Adult.—Body oval and shiny, general coloration red brown, with numerous dorsal and ventral hairs. Antenna, rostrum, tibiae, and tarsi yellowish brown; femora reddish brown. Hemelytra with pale lines along claval suture and on some corial veins. Lateral corial margins pale brown and expanded. Fore femur unarmed; rostrum reaching mesocoxae. Evaporative area covering only basal region of metapleuron.

Biology.—*Paragonatas costaricensis* was collected under the litter of *F. trigonata*. It was found between April and May 2001. It is a relatively rare species, found in small numbers at most study sites, but it was usually very active. This species also was collected at light traps.

Distribution.—MEXICO: Campeche, Chiapas, Jalisco, Oaxaca, Puebla, San Luis Potosi, Sinaloa, Veracruz, and Yucatan.

Paragonatas divergens (Distant)
(Figs. 7A, B)

Adult (Fig. 7B).—Body 4.5–5.0 mm in length. Body surface dull, black; head shiny black; antenna pale brown with segment IV slightly darker, segment II larger than segment III and IV; pronotum black with lateral margins ochraceous, scutellum black; clavus ochraceous with numerous dark punctures and with a parallel line to margin of scutellum; corium black, with veins, base, and union with clavus ochraceous, costal margin and irregular subapical macula gray; hemelytral membrane smoky, base and veins paler. Coxae shiny black ventrally, femora dark brown; rostrum, tibiae, and tarsi pale ochraceous, tibiae with numerous hairs; fore femur with two or three short acute spines below a series of elongate setae; rostrum reaching mesocoxae. Scent gland auricle slender, acuminate, not strongly hooked posteriorly; evaporative area covering all but outer one-third of metapleuron.

Fourth instar (Fig. 7A).—Body elongated, maximum width through abdominal segment III, head, pro-, meso-, and metanotum, and thoracic pleurae brown. Eyes red. Antennal segments brown with white bases. Labial segments I to III pale brown, segment IV brown. Femora pale brown, tibia and tarsi pale yellow. Abdomen pinkish, with pale yellow unions between segments. Scent gland plates present on segments III–IV, IV–V and V–VI; first two elongate and third very small and without openings. Ventral plates present on abdominal segments VI–VIII. Dorsal surface of head, thorax and abdomen, and ventral surface of abdomen covered by small brown hairs. One long tricothrium on each frontal angle of pronotum. Lateral margins of pro- and mesonota with thick setae. Tibiae of all legs with spinelike setae. Fore femur with a line of spinelike setae on internal margin. Labium reaching middle metacoxae. Measurements ($n = 1$). Body length 3.8; head length 0.7; width across eyes 0.75; interocular distance

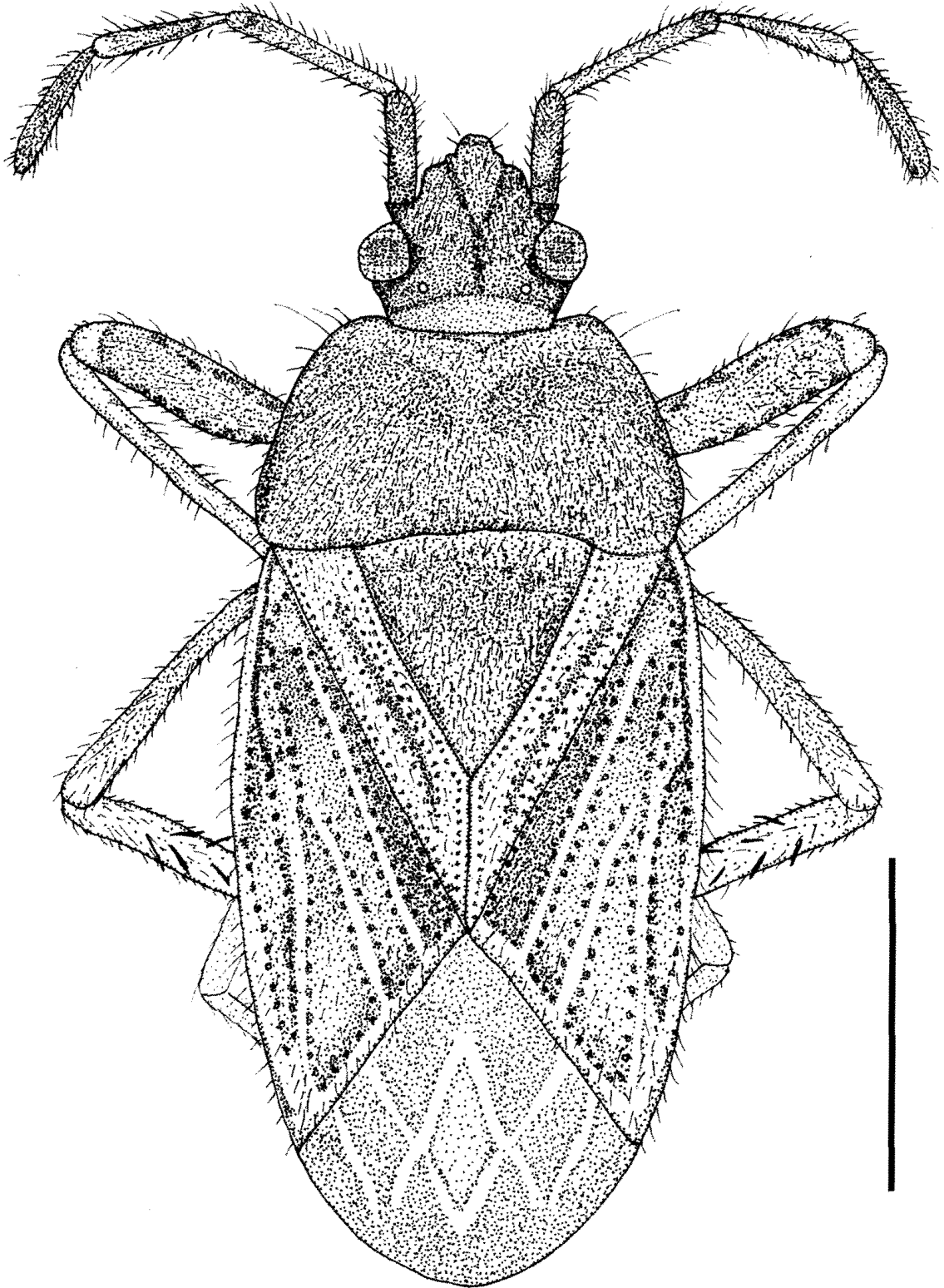


Fig. 6. *Paragonatas costaricensis*. Adult. Scale = 1 mm.

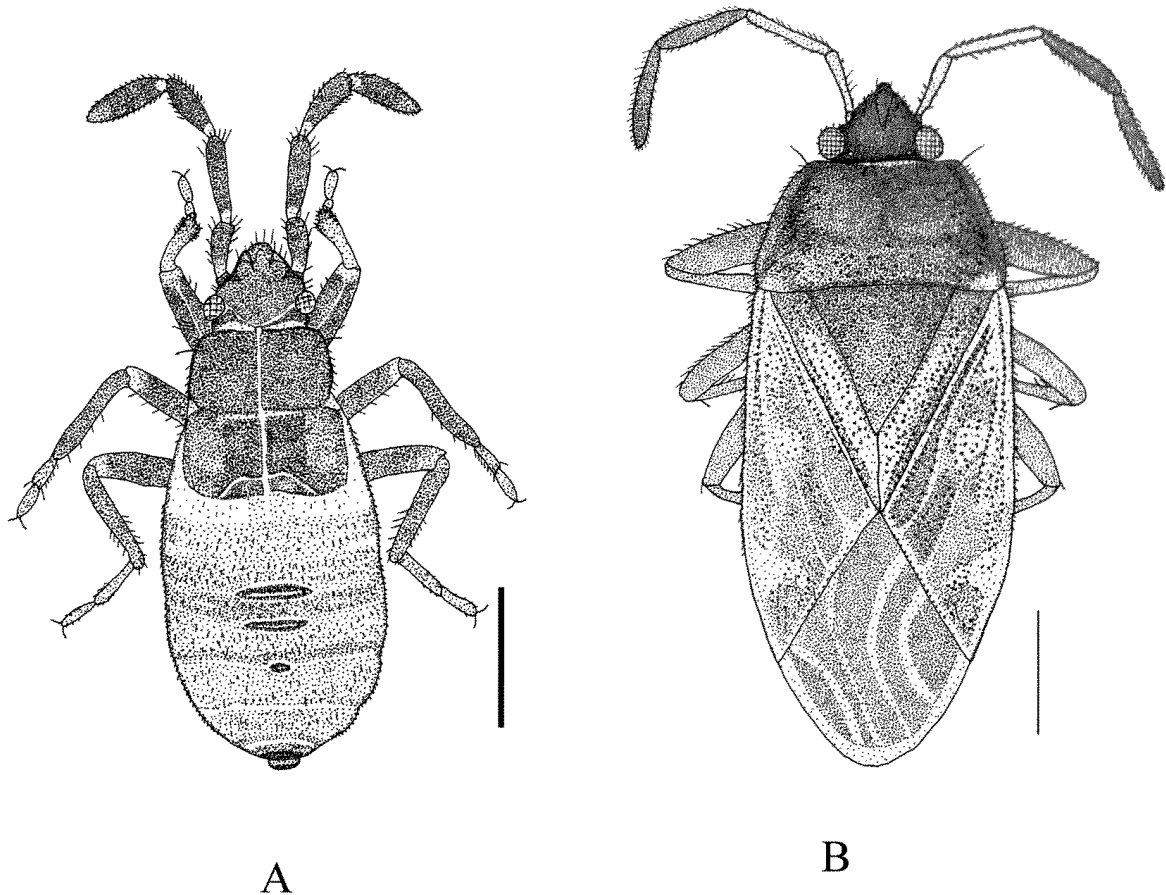


Fig. 7. *Paragonatas divergens*. A, Fourth instar. B, Adult. Scale = 1 mm.

0.5; postocular distance 0.175; antennal segment lengths: I 0.425, II 0.6, III 0.55, IV 0.7; rostral segment lengths: I 0.55, II 0.58, III 0.46, IV 0.4; pronotum length 0.6; width across humeral angles 0.1; width across anterior margin 0.8; fore leg: femur length 0.9; tibia length 0.9; tarsomere lengths: I 0.25, II 0.3.

Biology.—*Paragonatas divergens* was collected in the litter of *F. continifolia*, *F. ovalis*, *F. pertusa*, and *F. tecolutensis* throughout the year. This species also was collected in large quantities at light traps.

Distribution.—MEXICO: Campeche, Chiapas, Guerrero, Jalisco, Morelos, Oaxaca, San Luis Potosi, Tabasco, Tamaulipas, and Veracruz.

Petissius spinipes Stål
(Figs. 8A–G)

Adult (Fig. 8G).—Body oval, slightly elongate; dorsal surface dark brown, almost

black, slightly shiny. Head with a basal mesial iridescent spot. Antenna, labium, and legs pale brown. Pronotum with lateral margins pale brown; a pair of yellowish-brown maculae on anterior border, some individuals with humeral angles yellowish brown. Pronotal calli dark brown, almost black, without punctures, rest of pronotum, and scutellum dark brown and covered with punctures. Hemelytra dark brown with numerous punctures; clavus with three lines of webbed punctures and one irregular line. Venter of entire body black. Head slightly declivent. Antennal segment I smallest, other three of similar size. Labium reaching metacoxae. Lateral margins of pronotum slightly expanded, carinate, with a pair of tricobothria on anterior third; transverse impression of pronotum well defined. Pronotum with anterior and posterior margins straight, lateral margins convex. Scutellum

with a mesial elevated line. Metathoracic scent gland with evaporative area rough and expanded anteriorly, longer than posterior mesopleuron. Fore femur with four distal spines, arranged in a line, and two long and proximal seta, on same line. Fore tibia with posterior spines; only hind leg, and tibiae of other legs with spines on all their surfaces. Tarsi with numerous short setae.

Egg (Fig. 8A).—Ovoid, both poles rounded. 1.12 ± 0.06 mm long by 0.64 ± 0.04 mm wide. White when laid, turning yellowish brown in two days, and six days later finally turning reddish. Corium surface almost completely smooth, except for very small mycophilous processes on anterior pole.

First instar (Fig. 8B).—Body slightly elongate, abdomen as wide as thorax. Head, pro-, and mesonota pale brown, although slightly darker towards posterior margin of each segment. Metanotum pale yellow. Eyes red. Antennal segments I and IV pale yellow and segments II and III pale brown, joint between each segment reddish. Labium and legs pale yellow; femora and apex of labium sometimes grayish. Thoracic pleurae brown. Dorsal and ventral surfaces of abdomen reddish with a few irregular pale yellow maculae; unions between each segment also pale yellow. Scent gland openings between segments III–IV, IV–V and V–VI narrow and brown, becoming smaller caudally. Tylus as long as half of antennal segment I. Labium slightly longer than metacoxa. Dorsal surface of head with a few short setae and a trichobothrium situated just in front of each eye; pronotum with trichobothrium on each lateral margin near front angle. Measurements ($n = 10$). Body length 1.6 ± 0.14 ; head length 0.37 ± 0.04 ; width through eyes 0.42 ± 0.03 ; interocular distance 0.27 ± 0.03 ; postocular distance 0.08 ± 0.03 ; antennal segment lengths: I 0.17 ± 0.02 , II 0.21 ± 0.03 , III 0.18 ± 0.02 , IV 0.44 ± 0.04 ; rostral segment lengths: I 0.26 ± 0.01 , II 0.24 ± 0.03 , III 0.19 ± 0.03 , IV 0.21 ± 0.02 ; pronotum: length 0.19 ± 0.04 , width across humeral

angles 0.33 ± 0.02 , width across anterior margin 0.3 ± 0.01 ; hind leg: femur length 0.4 ± 0.07 , tibia length 0.44 ± 0.06 , tarsomere lengths: I 0.12 ± 0 , II 0.18 ± 0.02 .

Second instar (Fig. 8C).—Very similar to first instar, although abdomen wider than thorax. Head, pro- and mesonota turn dark brown. Antennal segments I to III pale brown, segment IV pale yellow. Labium and legs pale brown. Abdomen with orange areas around scent gland openings; a few pale brown maculae appear on lateral margins of each segment. Labium reaching sternite III. Fore femur wider than other femora, with a row of small spines on its external margin. Measurements ($n = 10$). Body length 1.85 ± 0.15 ; head length 0.46 ± 0.05 ; width through eyes 0.51 ± 0.01 ; interocular distance 0.34 ± 0.04 ; postocular distance 0.07 ± 0.06 ; antennal segment lengths: I 0.25 ± 0.02 , II 0.32 ± 0.02 , III 0.3 ± 0.02 , IV 0.51 ± 0.02 ; rostral segment lengths: I 0.34 ± 0.03 , II 0.33 ± 0.02 , III 0.3 ± 0.04 , IV 0.28 ± 0.02 ; pronotum: length 0.28 ± 0.02 , width across humeral angles 0.43 ± 0.03 , width across anterior margin 0.39 ± 0.02 ; hind leg: femur length 0.59 ± 0.02 , tibia length 0.68 ± 0.02 , tarsomere lengths: I 0.2 ± 0.02 , II 0.24 ± 0.02 .

Third instar (Fig. 8D).—Slightly pyriform, maximum width across abdominal segment V. Dark brown areas of body and antennal segments I to III turning darker. Pronotum and mesonotum with a pair of irregular pale yellow bands on each side of middle line. Lateral margins of pronotum pale yellow. Thoracic pleurae dark brown, almost black. Metanotum and first abdominal segment pale yellow; metanotum with a few pale brown areas near base. Abdomen pale brown. Abdominal venter with small mesial pale spots, and with numerous setae bent caudally. Ventral spiracles visible on segments II–VIII. Segment IV with a trichobothrium situated below spiracle, appearing in line with anterior and posterior trichobothria of segment V. Segment VI with one anterior and two posterior trichobothria.

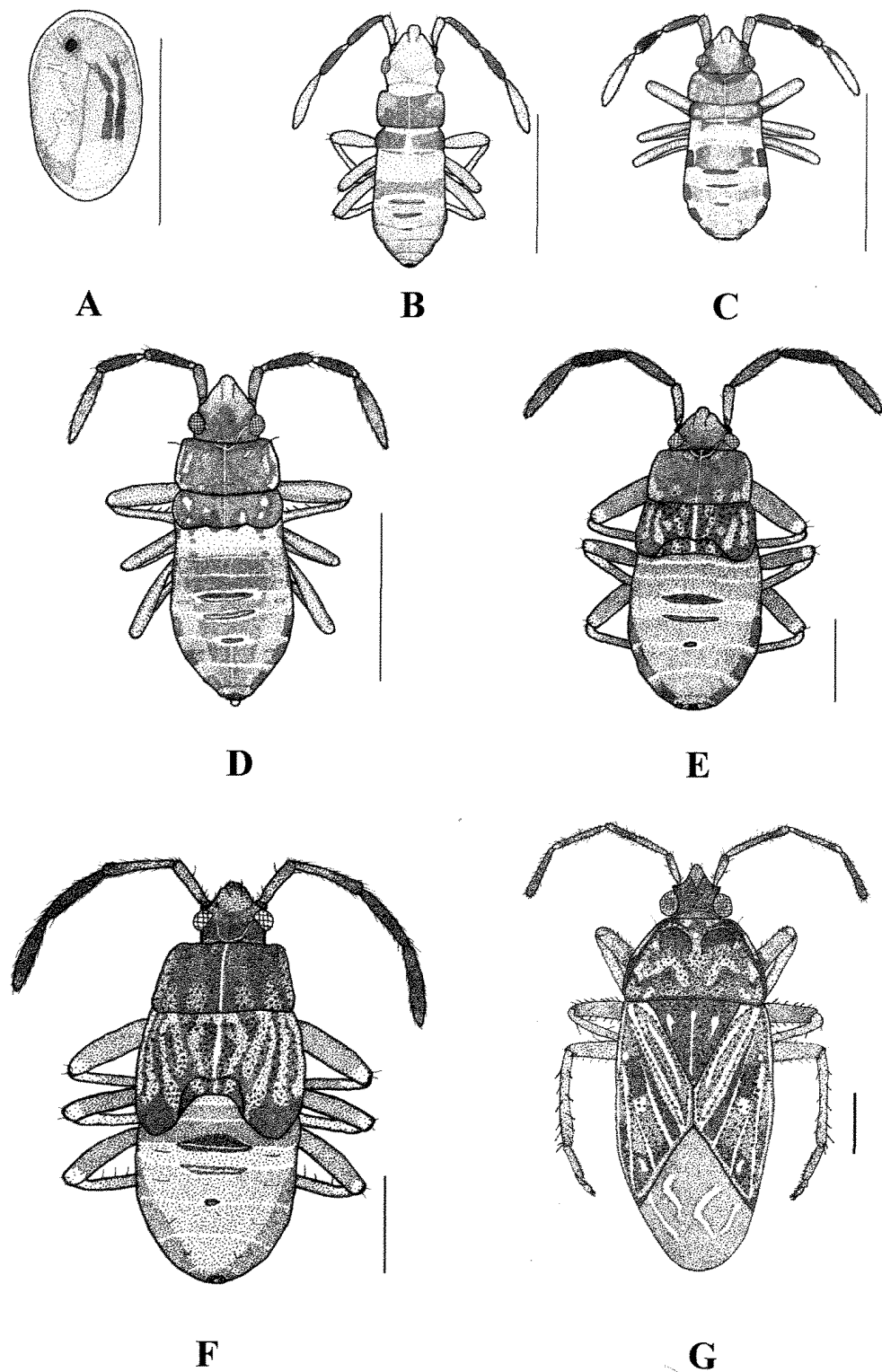


Fig. 8. *Petissius spinipes*. A, Egg, dorsal view. B, First instar. C, Second instar. D, Third instar. E, Fourth instar. F, Fifth instar. G, Adult. Scale = 1 mm.

Posterior segment and segment VII with two posterior tricobothria. Measurements ($n = 10$). Body length 2.79 ± 0.32 ; head length 0.6 ± 0.08 ; width through eyes 0.62 ± 0.05 ; interocular distance 0.42 ± 0.04 ; postocular distance 0.08 ± 0.07 ; antennal segment lengths: I 0.33 ± 0.07 , II 0.43 ± 0.08 , III 0.44 ± 0.02 , IV 0.6 ± 0.05 ; rostral segment lengths: I 0.42 ± 0.05 , II 0.44 ± 0.05 , III 0.42 ± 0.05 , IV 0.32 ± 0.02 ; pronotum: length 0.42 ± 0.02 , width across humeral angles 0.76 ± 0.06 , width across anterior margin 0.62 ± 0.05 ; hind leg: femur length 0.77 ± 0.09 , tibia length 0.94 ± 0.19 , tarsomere lengths: I 0.3 ± 0.04 , II 0.28 ± 0.03 .

Fourth instar (Fig. 8E).—Oval, with maximum width across abdominal segment V. Very similar to third instar, although antennal segment IV may be pale yellow or dark brown; unions between segments red. Pro-, and mesonota, and visible part of metanotum with numerous dark brown punctures. Anterior margin of pronotum sometimes black, with pale yellow bands, appearing only as spots near posterior margin. Mesonotum with a pair of pale yellow bands along wing pads; two bands and two small pale yellow spots on area of scutellum. Metanotum with a pale yellow band on each side of middle line. Scent gland openings between segments V–VI with only a small dark brown macula. Labium reaching metacoxae. Metathoracic wing pads covering almost all of metanotum. Tibiae with numerous spines. Conexivum more apparent than in previous instar. Measurements ($n = 10$). Body length 3.64 ± 0.4 ; head length 0.6 ± 0.12 ; width through eyes 0.86 ± 0.06 ; interocular distance 0.5 ± 0.06 ; postocular distance 0.09 ± 0.08 ; antennal segment lengths: I 0.44 ± 0.04 , II 0.66 ± 0.05 , III 0.62 ± 0.06 , IV 0.76 ± 0.06 ; rostral segment lengths: I 0.58 ± 0.12 , II 0.62 ± 0.08 , III 0.56 ± 0.07 , IV 0.41 ± 0.02 ; pronotum: length 0.63 ± 0.08 , width across humeral angles 0.98 ± 0.06 , width across anterior margin 0.71 ± 0.09 ; hind leg: femur length 1.11 ± 0.17 , tibia length

1.33 ± 0.11 , tarsomere lengths: I 0.44 ± 0.03 , II 0.34 ± 0.03 .

Fifth instar (Fig. 8F).—Slightly pyriform. Similar to fourth instar. Antennal segment IV dark brown. Apex of femora and tarsi pale yellow. Apices dark brown mesothoracic wing pads with four, longitudinal, pale yellow bands. Scutellum with two pale yellow bands, one on lateral margin and one mesially. Abdominal segments reddish brown, with joints pale yellow. Mesial maculae of sternites VI–VIII becoming larger and appearing as a continuous mesial band. Other characteristics as in fourth instar. Measurements ($n = 10$). Body length 4.45 ± 0.88 ; head length 0.64 ± 0.15 ; width through eyes 0.89 ± 0.15 ; interocular distance 0.55 ± 0.08 ; interocellar distance 0.04 ± 0.03 ; postocular distance 0.03 ± 0.01 ; antennal segment lengths: I 0.41 ± 0.1 , II 0.81 ± 0.1 , III 0.78 ± 0.09 , IV 0.8 ± 0.1 ; rostral segment lengths: I 0.64 ± 0.08 , II 0.59 ± 0.14 , III 0.55 ± 0.17 , IV 0.38 ± 0.05 ; pronotum: length 0.66 ± 0.02 , width across humeral angles 1.14 ± 0.19 , width across anterior margin 0.81 ± 0.26 ; scutellum: length 0.62 ± 0.05 , width 0.81 ± 0.06 ; hind leg: femur length 1.25 ± 0.24 , tibia length 1.48 ± 0.43 , tarsomere lengths: I 0.46 ± 0.16 , II 0.38 ± 0.05 .

Biology.—*Petissius spinipes* was collected under the litter of *F. cotinifolia* in central Veracruz, during April. In southern Veracruz, this species was common throughout the year but was more abundant in May and June. First-instar nymphs were usually found under leaf litter of several species of figs, and adults and fifth-instar nymphs were found on superficial layers of leaf litter. Associated fig species included *F. insipida*, *F. tecolutensis*, and *F. yoponensis*. In the laboratory, the life cycle of *P. spinipes* took about 53 days. The egg when first laid was white; after three days some red marks started to appear, first on the anterior pole and then the entire egg; eggs remained red for five days before hatching. The first molt appeared after six days. First-instar nymphs were not very active and al-

ways were found feeding inside the fruit. After six days they molted to the second instar, which lasted 11 days, and became slightly more active. Third instars showed similar behavior and lasted 7 days. Fourth instars lasted 8 days and fifth instars 12 days. Their behavior in the field showed that when disturbed, nymphs and adults usually hide in soil crevices. Although this species seems to develop while feeding on fig seeds, it is not always associated with them. Like other Lethaeini species reported in this study, it is considered a facultative terrestrial seed predator of figs.

Distribution.—MEXICO: Campeche, Chiapas, Guerrero, Hidalgo, Jalisco, Morelos, Nayarit, Oaxaca, Puebla, Queretaro, Quintana Roo, San Luis Potosi, Tamaulipas, and Veracruz.

DISCUSSION

All Lethaeini reported in this paper are considered facultative terrestrial seed predators, are extremely rapid in movement, and adults usually run under dead leaves and hide in soil crevices. They seem to be associated with numerous species of *Ficus*. *Cryphula apicata* and *Paragonatas costaricensis* were the only rare species and were found associated only with *F. calyculata* and *F. trigonata*, respectively. *Neopetissius slaterorum* was associated with seven species of figs; *Cryphula trimaculata*, with five species; *P. divergens* and *P. spinipes*, with four; and *Cistalia pallidifemur* with two. These species, as with some Myodochini reported by Cervantes and Gamez (2005), are facultative feeders, and they differ from the Ozophorini (Cervantes et al. 2004) in which all the species reported are obligatory and feed exclusively on figs.

Although Sweet (1964) reported that *Cryphula trimaculata* is univoltine with an obligatory adult diapause in Connecticut, the asynchronous fruiting of species of figs recorded as hosts in this study, along with the favorable weather, provide a continuous food supply and permit multiple generations. Nymphs of five species are reported,

although not all instars of each are described. Fourth-instar nymphs of *C. trimaculata*, *P. divergens*, and *P. spinipes* can be distinguished by their general coloration. The posterior pronotal lobe of *P. divergens* is pale brown, whereas in *C. trimaculata* and *P. spinipes* it is mixed with brown and pale yellow. Nymphs of *P. divergens* are more pubescent than the other species.

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