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Revision of the *femoralis* group of *Blepharoneura* Loew (Diptera: Tephritidae)

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Abstract

The *femoralis* species group of the genus *Blepharoneura* is revised. The following 42 species, including 32 new species, are recognized: *amplihyalina*, **n. sp.** (northwestern Argentina), *apaapa*, **n. sp.** (Bolivia), *aspiculosa*, **n. sp.** (Mexico), *bidigitata*, **n. sp.** (southern Brazil), *bipunctata*, **n. sp.** (Ecuador), *biseriata* Wulp (Mexico), *bivittata*, **n. sp.** (Nicaragua, Costa Rica), *brevivittata*, **n. sp.** (Costa Rica to Peru), *chaconi*, **n. sp.** (Costa Rica), *cornelli*, **n. sp.** (Costa Rica), *cyclantherae*, **n. sp.** (Mexico), *femoralis* Wulp (Mexico to Brazil), *fernandezi*, **n. sp.** (Venezuela, northern Brazil), *furcifer* Hendel (Venezuela to Bolivia and Brazil), *hirsuta* Bates (Venezuela, Guyana, Brazil), *hyalinella*, **n. sp.** (Bolivia), *io* Giglio-Tos (Mexico), *isolata*, **n. sp.** (Guatemala), *lutea*, **n. sp.** (Costa Rica), *macwilliamsae*, **n. sp.** (Costa Rica), *marshalli*, **n. sp.** (northwestern Argentina), *mexicana*, **n. sp.** (Guatemala, Mexico), *mikenoltei*, **n. sp.** (Costa Rica), *multipunctata*, **n. sp.** (Ecuador), *nigriapex*, **n. sp.** (Bolivia), *nigrifemur*, **n. sp.** (Bolivia), *osmundsonae*, **n. sp.** (Mexico), *punctistigma*, **n. sp.** (Mexico to Costa Rica), *quadristriata* Wulp (Mexico to Costa Rica; possibly Colombia), *quetzali*, **n. sp.** (Guatemala), *regina* Giglio-Tos (Mexico), *rupta* (Wulp) (Mexico to Costa Rica), *ruptafascia*, **n. sp.** (Ecuador), *septemdigitata*, **n. sp.** (Peru, Bolivia), *sinepuncta*, **n. sp.** (Costa Rica), *splendida* Giglio-Tos (Mexico to Ecuador), *tau*, **n. sp.** (Costa Rica), *thetis* Hendel (southern Brazil), *unifasciata*, **n. sp.** (Ecuador), *variabilis*, **n. sp.** (Mexico), *wasbaueri*, **n. sp.** (Ecuador), and *zumbadoi*, **n. sp.** (Costa Rica). *Blepharoneura amazonensis* Lima & Leite, 1952 is considered a new synonym of *B. hirsuta* Bates, 1933, and a lectotype is designated for *Blepharoneura furcifer* Hendel, 1914. A key to species and phylogenetic analysis are provided, as well as descriptions, illustrations, distributions, and host plant data (as available) for each species.

Key words: Diptera, Tephritidae, taxonomy, phylogeny, host plant, Cucurbitaceae

Introduction

Blepharoneura Loew is an endemic Neotropical genus of fruit flies that breed only in native Cucurbitaceae. We estimate that there may be 200 or more species, most of which are undescribed (Condon 1994, Condon & Norrbom 1999). Observations of the fascinating biology of various species and our desire to understand the evolution of their complex pattern of host relationships (Condon 1994, Condon & Norrbom 1994, 1999, Condon & Steck 1997, Condon *et al*., 2008a, b) led to our taxonomic study of the genus, which has never been comprehensively revised. In this paper we revise the species of the *femoralis* group, the smaller of the two species groups within *Blepharoneura*.

Previous taxonomic treatment of *Blepharoneura* has been mainly limited to individual species descriptions, most produced prior to 1935. Norrbom *et al.* (1999) cataloged the 22 described species. The only keys to the species of the genus, those of Wulp (1899) to 7 species and Hendel (1914) to 15 species, are badly outdated. Norrbom & Condon (1999) analyzed the relationships among *Blepharoneura* and the four other genera of Blepharoneurinae, and Condon & Norrbom (1994) and Norrbom & Condon (1999) recognized two species groups within *Blepharoneura*, the *poecilosoma* and *femoralis* groups. Condon & Norrbom (1999) discussed *Blepharoneura* biology and behavior, providing new data, including brief host plant records for several species of the *femoralis* group. Full data to document these records also are provided here.

Materials and methods

Genetic and morphometric analyses have revealed that many species of *Blepharoneura* are extremely similar morphologically (Condon & Norrbom 1994, Condon & Steck 1997, Condon *et al*. 2008a, Marsteller *et al.* 2009). Molecular data are unavailable for most species of the *femoralis* group and thus the species limits we have recognized are based mainly on gaps in morphological variation. The limits of these "morphospecies" may be too broad in some cases (e.g., the populations here treated as *B. femoralis*), but until more biological information is available, we prefer to take a conservative approach to species delimitation. As in many tephritid genera, characters of the female terminalia, particularly the shape of the aculeus tip, are important diagnostic characters for species of the *femoralis* group. We provide descriptions for several distinctive species known only from male specimens, but we have not formally named several others pending discovery of females.

We follow the morphological terminology of White *et al.* (1999). Condon & Norrbom (1994) attempted to homologize the hyaline spots and other markings in the wing patterns of three species of the *Blepharoneura poecilosoma* group. We have followed this system with slight modification as explained below. Spot numbers are shown in Figures 2–5. In the descriptions, the spot numbers are preceeded by a # sign and are included in brackets following the standard description of the spot, for example, "cell r_1 with subapical hyaline spot [#6] large." A number followed by a ? indicates uncertainty about the homology of the spot or mark. The *femoralis* group is more variable in wing pattern (i.e., has a greater diversity of patterns) than the *poecilosoma* group. Many species have bands or large hyaline areas of various shapes that appear to be fusions of spots that are separate in other species. Some of these hyaline areas probably include fusions of additional, novel (i.e., previously unnumbered) spots. We have not assigned numbers to all of these areas, but included those that appear to be homologous with markings in the *poecilosoma* group and those that have significance for identification purposes or were used in the phylogenetic analysis. Novel wing markings not found in the species of the *poecilosoma* group treated by Condon & Norrbom (1994) and not numbered by them include the following. Spot #18A is a marginal or submarginal spot in cell r_{4+5} anterior to #18. Spot #6B is a subapical spot in the posterior part of cell r_1 not reaching the costa. Spot #49 is a medial spot in the proximal part of cell m near the midlength of crossvein dm-cu. Spot #50 is an anteromedial spot in cell dm distal to the level of the subapical spot [#13] in cell br and the aligned spot in dm [#21]. Spots #51 and #52 are subbasal anterior and posterior spots, respectively, in cell dm proximal to the level of spot #13, and spot #53 is a posterior subapical

hyaline spot in cell dm aligned with the subapical hyaline mark in cell cu_1. The area interpreted by Condon & Norrbom (1994) as the single spot #10 appears to be a fusion of multiple spots; the marginal part is here interpreted as #10A and the interior part as #10B. A label of #10 on the figures or in the descriptions indicates that both parts are present. The elongate mark in cell m interpreted as spot #26 by Condon & Norrbom (1994; e.g., Fig. 7) also appears to be a fusion of spots (Condon et al. 2008a, fig. 6C). Spot #26 is present in the middle of the cell. Spot #26A is near or touches the anterior margin. The similar numbering of spots #10A and #10B, #18 and #18A, and #26 and #26A does not imply the homology of these pairs of spots, but is simply for the convenience of having spots in adjoining areas with similar numbers. The hyaline markings in cell cu_1 in the *femoralis* group are fairly consistent in position relative to each other, but vary in position versus the hyaline marks in cell dm, which was a criterion used to hypothesize spot homology in the *poecilosoma* group (Condon & Norrbom, 1994, Condon *et al*., 2008a). In the *femoralis* group there are usually 2–3 anterior spots or parts of more extensive fused markings. We have tentatively assigned the numbers 31, 32, and 33 to these anterior spots, but they may not be strictly homologous with the spots labeled with those numbers in the *poecilosoma* group. They often are larger than those in the *poecilosoma* group and may be fusions of spots and/or they may sometimes be novel (not previously numbered) spots. The proximal spot [#31] is variably present and usually is aligned with the subbasal spots [#51, #52], if present, in cell dm. The middle spot [#32] and distal spot [#33] are usually present; the former is aligned slightly proximal to the medial marginal spot [#36], and the latter with or slightly distal to the medial marginal spot. Homologies of some spots and bands are further discussed in Table 1.

In the descriptions, instead of strictly following a cell by cell format, we have described groups of spots that sometimes form larger markings that extend across multiple cells (i.e., we attempt to describe the broader pattern rather than individual spots). These include groups of spots in the radial cells slightly distal to the apex of vein R_1, a group in the apical parts of cells r_{2+3}, r_{4+5} and m, and another in the posteromedial part of the wing in cells dm and cu_1. Wing measurements were generally made on five specimens, if available. Wing length was measured from the base of the Costa to the wing apex (the longest distance from the base of the costa to the costal margin between the apices of veins R_{4+5} and M); wing width at the broadest part, in the vicinity of the apex of vein R_1 to the margin of cell cu_1. Oviscape length was measured from a line across the basal corners to the apex medially, including the medial lobe. Aculeus length was measured including the part extended inside the eversible membrane. The length of the aculeus tip was measured from the corner of the lateral lobe to the level of the apex (Fig. 162) or for species with digitate lateral lobes, from the base of the sublateral gap (Fig. 157). Gaps were measured at their greatest lengths and widths, i.e., in species with concave gaps to the margin of the concave area rather than the tip of the lobe (Fig. 162). Aculei usually are figured in dorsal view (Figs. 126–187).

Label data for all examined specimens were recorded in the New World fruit fly specimen database available on the Systematic Entomology Laboratory web site (www.sel.barc.usda.gov:591/diptera/Tephritidae/TephIntro.html). A USNM barcode label was added to any specimen without its own barcode label. These labels do not indicate ownership, they are unique identifier numbers. In the Type data and Specimen examined sections the barcode number is listed following the depository acronym for each specimen or series.

Acronyms for the institutions where specimens are deposited follow Thompson (1999): AMNH—American Museum of Natural History, New York; ANCB—Colección Boliviana de Fauna, Museo Nacional de Historia Natural, La Paz; BMNH—Natural History Museum, London; CAS—California Academy of Sciences, San Francisco; CDFA—California Department of Food & Agriculture, Sacramento; CMP—Carnegie Museum of Natural History, Pittsburgh; CNC—Canadian National Collection, Ottawa; DEBUG—Department of Environmental Biology, University of Guelph; FMNH—Field Museum of Natural History, Chicago; FSCA—Florida State Collection of Arthropods, Gainesville; HNHM—Hungarian Natural History Museum, Budapest; IEXV—Instituto de Ecología, Xalapa, Mexico; IML—Instituto Miguel Lillo, Tucumán; IMZ—Museo ed Istituto di Zoologia Sistematica, Universitá di Torino; INBio—Instituto de Biodiversidad,

Santo Domingo de Heredia, Costa Rica; INPA—Instituto Nacional de Pesquisas da Amazonia, Manaus; IZAM—Universidad Central de Venezuela, Maracay; MCZ—Museum of Comparative Zoology, Harvard University, Cambridge; MSUL—Michigan State University, East Lansing; MZUSP—Museu de Zoologia, Universidade de São Paulo; NMW—Naturhistorisches Museum, Vienna; SMT—Staatliches Museum für Tierkunde, Dresden; TAMU—Texas A&M University, College Station; TAUI—Tel Aviv University; UCB—University of California, Berkeley; UCRSJ—Universidad de Costa Rica, San José; UFPC—Universidade Federal de Paraná, Curitiba; UKaL—University of Kansas, Lawrence; USNM—National Museum of Natural History, Smithsonian Institution, Washington; USU—Utah State University, Logan; UVG—Universidad del Valle de Guatemala; ZIL—Zoological Institute, Lund.

Vouchers of the following host plants determined by Steve Smith were deposited in the Smithsonian herbarium: *Cyclanthera dissecta* (Norrbom 91M24), *C. langaei* (Norrbom 95CR14), *Microsechium helleri* (Norrbom 91M18), *Sechium* sp. (Norrbom 95CR15), and *Sicyos* sp. (Norrbom 07G53). Duplicates of *C. dissecta*, *C. langaei*, and the *Sicyos* sp. were deposited in the IEXV, INBio, and UVG herbaria, respectively.

Methods used for analysis of phylogenetic relationships are discussed in that section. The data were analyzed using TNT (Goloboff *et al*. 2003). The cladogram figures were produced with Winclada (K. C. Nixon 2002).

Taxonomy

Diagnosis of *Blepharoneura*

Blepharoneura species differ from all other Tephritidae by the following combination of characters: Prementum elongate and strongly convex; palpus not constricted near midlength; thorax with 1–2 postpronotal setae, 3 scutellar setae, and 3 anepisternal setae, including 1 just anterior to phragma on dorsal fourth; and vein Cu_1 setulose dorsally.

Description of *Blepharoneura*

Body nonmetallic, usually predominantly yellow, often with brown markings, occasionally predominantly brown.

Head: Frons setulose, with 2 orbital setae and usually 2 frontal setae. Ocellar and postocellar setae well developed. Frontal vitta usually orange, red or brown with narrow yellow area medially (Fig. 1). Facial carina weak. Vibrissa absent. Antenna moderately long but usually not reaching ventral margin of face. Arista long pubescent to short plumose. Prementum elongate and strongly convex. Labella with sclerotized ridges or spicules (modified pseudotracheal ring tips; often not exposed in dry specimens).

Thorax: Yellow to orange, often with brown markings, particularly on mesonotum, in a few species of *femoralis* group predominantly brown (Figs. 90–108). Scutum posteriorly usually with pair of brown markings or single band or larger mark, often with 2–4 vittae, especially anteriorly. 1–2 postpronotal setae (second seta often varies intraspecifically), 2 notopleural, 1 presutural and 1 postsutural postalar, 1 intra-alar, 1 postalar, often 1 intra-postalar, 1 dorsocentral, 1 acrostichal, 3 scutellar, 3 anepisternal (1 on upper fourth just anterior to phragma), 1 anepimeral, and 1 katepisternal setae.

Wing: Vein Sc subapically anteriorly turned at 80–90° angle. Veins R_1, R_{4+5}, Cu_1 and base of vein Cu setulose dorsally. Crossvein r-m near or distal to midlength of cell dm (measured along vein M). Cell bcu with elongate posterodistal lobe. Pattern usually predominantly brown with hyaline spots and marginal incisions, sometimes on apical third with hyaline bands; cells dm and cu_1 sometimes with large hyaline area or occasionally 1–2 hyaline bands (Figs. 2–81).

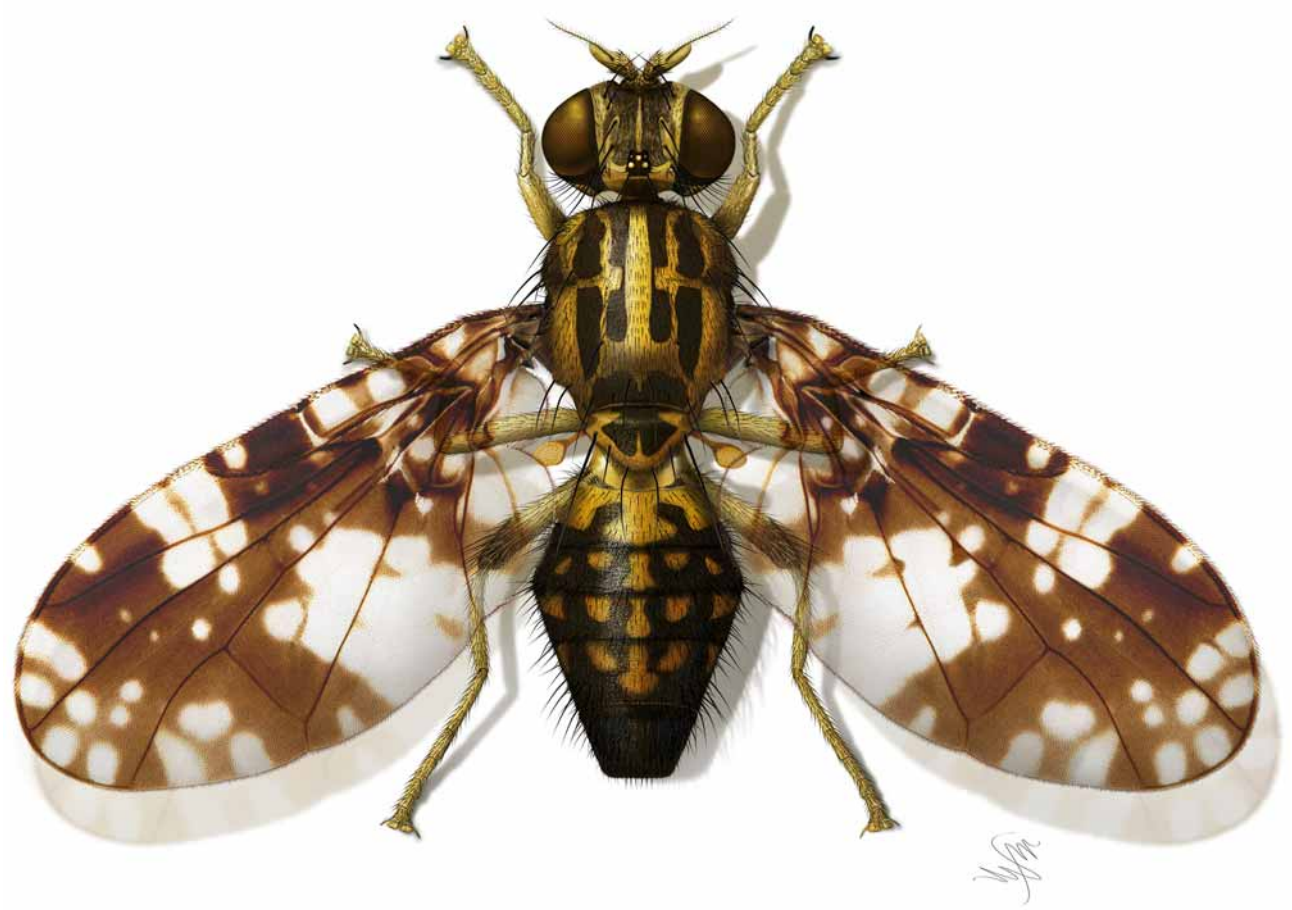
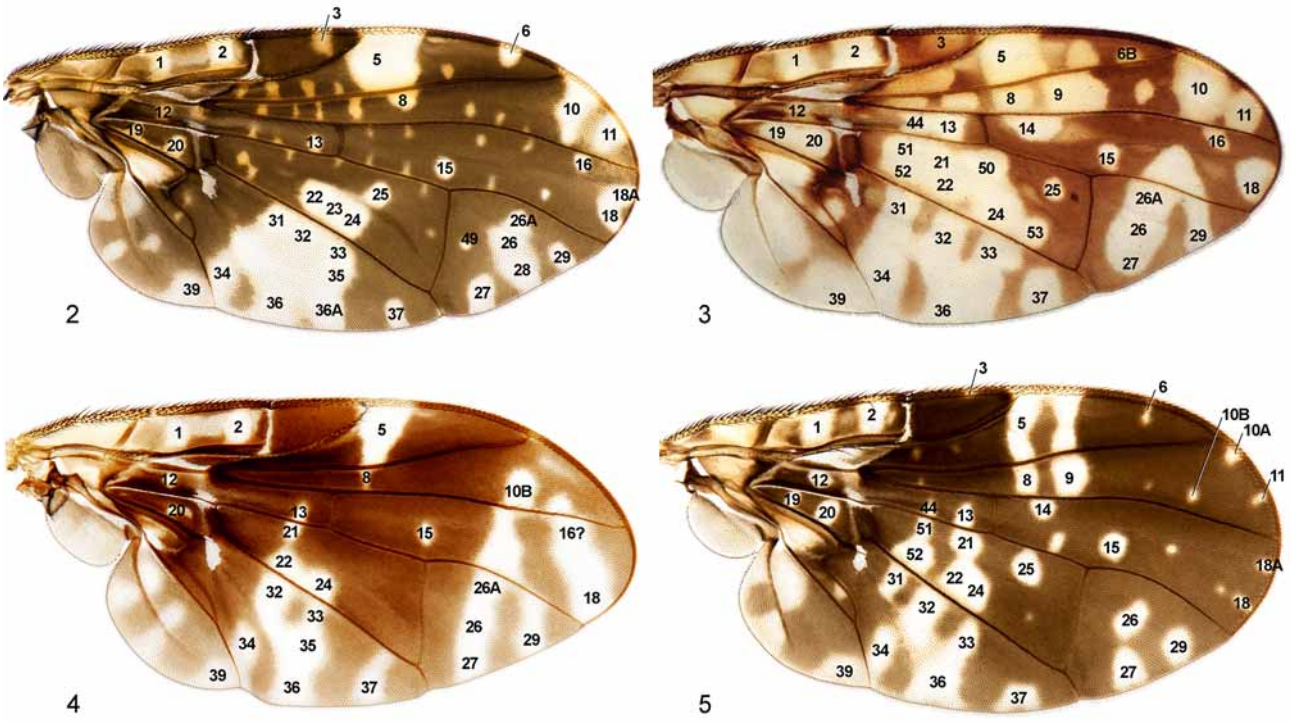


FIGURE 1. Habitus, dorsal: *B. nigrifemur* (Bolivia: Apa Apa, USNMENT00055924).



FIGURES 2–5. Wing: 2, *B. apaapa* (Bolivia: Apa Apa, USNMENT00055942); 3, *B. macwilliamsae* (Costa Rica: NE Canon Genesis, USNMENT00048612); 4, *B. rupta* (Costa Rica: SE Rio Naranjo, USNMENT00213532); 5, *B. wasbaueri* (holotype). See Materials and Methods section for explanation of numbering system for hyaline markings.

Abdomen: Occasionally entirely yellow, but usually yellow with brown spots or reticulate pattern to predominantly brown with medial yellow vitta or row of spots (Figs. 1, 113–125).

Female terminalia: Oviscape tapering, subconical to funnel-shaped (short, subconical, brown in *femoralis* group). Aculeus short, broad (especially in *femoralis* group), and flat; in *femoralis* group usually with acute or blunt scales on medial membrane (e.g., Figs. 126–135); tip in *poecilosoma* group triangular, with numerous distinct serrations, each associated with internal channel (Condon & Norrbom 1994, figs. 14–16), in *femoralis* group truncate to subtriangular, with step-like or digitiform lobes (Figs. 126–187). 3 spermathecae (Figs. 188–193), subspherical or occasionally conical, usually with sclerotized neck and/or small to large basal apodeme, surface without denticles.

Male terminalia: Lateral surstylus relatively short (Figs. 196–203), with epandrium forming near oval in posterior view. Glans with single membranous, non-spiculose, basal lateral lobe; elongate, basal half slender and membranous, distal half strongly sclerotized, cylindrical (*poecilosoma* group) or stout and bulbous (*femoralis* group). Proctiger sometimes weakly bilobed ventrally.

Egg (Figs. 194–195): Cylindrical ovoid, slightly curved, slightly tapered.

Diagnosis of the *femoralis* group

The *femoralis* and *poecilosoma* groups can be diagnosed reliably only by genitalic characters. In the *femoralis* group the aculeus is short and broad, usually with acute or blunt scales on the medial membrane. Its tip is truncate to subtriangular, with step-like or digitiform lobes. The sclerotized part of the glans is large and bulbous. In the *poecilosoma* group the aculeus lacks scales on the medial membrane and its tip is triangular, sometimes with slightly convex or concave margins, always with numerous distinct serrations, each associated with an internal channel. The sclerotized part of the glans is smaller and more cylindrical than in the *femoralis* group. Species with any of the following external characters (except as noted) also belong to the *femoralis* group; most but not all species of the group possess at least one of these characters: Anepisternum with brown spot dorsally (Fig. 107) or with more extensive brown markings (Fig. 106); hind femur distally brown or with brown spot (Figs. 109–112); scutum with unpaired medial anterior spot or vitta (Figs. 90–93) or with submedial spots or vittae anterior to transverse suture (Figs. 94–105) (presutural medial marks are lacking and submedial marks are rare in the *poecilosoma* group (at least in described species) which more commonly have only sublateral markings anteriorly; see Condon & Norrbom 1994, fig. 5); wing with preapical hyaline band more or less parallel to costa in cells r_{4+5} and m and reaching margin in cell m (e.g., Figs. 9, 15–22, 25) (species 16 (Condon *et al.* 2008b) of the *poecilosoma* group reared from flowers of *Gurania makoyana* (Lemaire) Cogn. in Costa Rica has a pattern similar to Fig. 66); cell r_{4+5} with 2 apical or subapical hyaline spots or 1 bilobed mark (e.g., Figs. 10–14, 40) or with single concave band extending from cell r_{2+3} and reaching costal margin in both cells (e.g., Figs. 32–34, 44, 56, 61–62); and/or cell dm or cu_1 (or both) with large hyaline area filling more than half of cell (e.g., Figs. 2–3, 6–8, 23–24).

Key to species of the *femoralis* group

1. Anepisternum mostly brown or at least with medial spot extended dorsally to level of anterior seta (Fig. 106). Hind femur with apical 1/2–1/4 entirely dark brown (Fig. 110) (*B. femoralis* rarely with only elongate anteroventral and posteroventral brown marks). 2
- Anepisternum entirely yellow (Fig. 108) or at most with small dark brown spot dorsal or posterodorsal to anterior seta (Fig. 107). Hind femur usually entirely yellow or at most with elongate anteroventral and posteroventral brown marks apically (Figs. 109, 111–112) (more extensively brown in *B. nigriapex* and *wasbaueri*). 11
2. Cell r_{2+3} with solid dark band along costal margin (Figs. 9, 53–54, 63–65). Cell r_1 with 1 well defined inverted hyaline triangle 3
- Cell r_{2+3} with 2 hyaline marginal spots (Figs. 13–14, 27–29). Cell r_1 with 2–3 hyaline marks 6

3. Cell dm distal to crossvein r-m with isolated hyaline spot in anterior half distinctly distal to hyaline posterior spot or band (Figs. 9, 53–54). Pterostigma with distinct subapical hyaline or yellow spot. Aculeus tip with steps shallow, lobes not strongly produced and relatively blunt (Figs. 136, 181) 4
- Cell dm distal to crossvein r-m usually without isolated hyaline spot in anterior half, if present narrowly separated from and aligned with hyaline posterior spot or band (Figs. 63–65). Pterostigma usually without subapical hyaline spot (occasionally present in *splendida*). Aculeus tip with steps deeper and lobes more pronounced and acute (Figs. 144, 184–187) 5
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- Subapical hyaline area in cells r_{2+3} and r_{4+5} usually constricted or interrupted along vein R_{4+5} (Fig. 53–54). Cell dm often with 2 separate hyaline areas in basal 3/4. Aculeus (Fig. 181) with acute scales medially, with lobed apical part 0.41–0.45 times as long as wide, with third lobe from middle larger than second lobe. Mexico to Costa Rica. .... *punctistigma*, **n. sp.**
5. Submedial scutal vittae usually separate from spots on posterior margin, if connected at least narrowed near dorsocentral setae. Aculeus tip short triangular, less than half as long as wide, with gaps between lobes wider than long (Figs. 184–187). Mexico to Ecuador..... *splendida* Giglio-Tos
- Submedial scutal vittae uninterrupted, connected to spots on posterior margin. Aculeus tip elongate triangular, slightly more than half as long as wide, with gaps between lobes longer than wide (Fig. 144). Costa Rica. .... *sinepuncta*, **n. sp.**
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- Aculeus tip with lateral margin rounded proximal to lateral lobe or with lateral lobe weak or absent, lobed part often more than 0.5 times as long as wide (Figs. 143, 173–174, 183–183)..... 9
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- Aculeus tip with lateral lobe small and acute, sublateral lobe similar in size to submedial lobe (Fig. 137). Medial membrane of aculeus with relatively few acute scales extending only about midway to tip. Mexico .... *cyclantherae*, **n. sp.**
8. Aculeus tip with medial lobe convex, gaps between lobes deeply concave (Figs. 176–180). Mexico to Brazil .... *femoralis* Wulp
- Aculeus tip with medial lobe truncate or slightly notched, gaps between lobes shallow (Fig. 145). Costa Rica .... *zumbadoi*, **n. sp.**
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- Cell cu_1 with subapical marginal hyaline spot small, not reaching vein Cu_1 (Fig. 51). Medial membrane of aculeus with scales acute (Figs. 143). Bolivia ..... *nigrifemur*, **n. sp.**
10. Medial membrane of aculeus with acute scales dorsally and ventrally (Fig. 173). Lobed part of aculeus tip short triangular, 0.43–0.54 times as long as wide, part distal to sublateral lobe about half as long as wide (Figs. 173–174). Mexico ..... *biseriata* Wulp
- Medial membrane of aculeus ventrally without scales, dorsally with scales mostly polygon-shaped, acute only proximally (Figs. 182–183). Lobed part of acuelus tip slender and elongate, 0.63–0.66 times as long as wide, part distal to sublateral lobe almost as long as wide. Mexico..... *osmundsonae*, **n. sp.**
11. Wing with oblique subapical hyaline band more or less parallel to costa, extending from wing margin in cell r_{4+5} into cell r_{2+3}, cell r_{2+3} without marginal hyaline marks except very rarely subapical band very narrowly touching margin near apex of vein R_{2+3} (Figs. 4, 15–22, 35–37). Cell r_1 without subapical marginal hyaline spots..... 12
- Wing with subapical spots or bands, subapical band, if present, usually with concave apical margin, cell r_{2+3} with at least 1 hyaline mark broadly reaching margin (Figs. 10–12, 23–24, 30–34, 43–44, 70). Cell r_1 often with subapical marginal hyaline spot or spots 24
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- Cell c with 2 subrectangular hyaline marks separated by distinct brown medial mark (Figs. 21–22, 41). Scutum posterior margin with 0 or 2 brown spots..... 14
14. Scutum without postsutural brown markings, with only pair of submedial vittae presuturally. Wing with apical brown band much narrower in cell r_{2+3} than in cell r_{4+5} (Figs. 21–22). Proximal posterior hyaline spot in cell m reaching posterior margin, distal spot not extending into cell r_{4+5}. Peru, northern Brazil ..... sp. nr. *brevivittata*

- Scutum with pair of brown spots on posterior margin and 2 pairs of brown vittae extending posterior to transverse suture (similar to Figs. 103–104). Apical brown band about as wide in cell r_{2+3} as in cell r_{4+5} (Fig. 41). Proximal posterior hyaline spot in cell m isolated from margin, distal spot extending into cell r_{4+5}. Guatemala..... *isolata*, **n. sp.**

15. Posterior third of anepimeron, dorsal third of katatergite and most of anatergite with continuous brown area. Abdomen brown except yellow T-shaped mark and base and lateral margins of syntergite 1+2 (Fig. 118). Wing with hyaline mark extending across vein M between crossveins r-m and dm-cu and without hyaline spot in cell r_{2+3} aligned with dm-cu (Fig. 66). Apical brown band as broad as subapical hyaline band. Costa Rica..... *tau*, **n. sp.**
- Thoracic pleuron entirely yellow or (some *B. quetzali* and *variabilis*) at most with single brown spots on anepimeron, katatergite, anatergite and/or basalare. Abdomen variable but with additional yellow areas. Wing without hyaline mark extending across vein M between r-m and dm-cu (Figs. 4, 15–20, 25, 35–37, 42) or if so (rarely in *B. variabilis*) with large hyaline spot in cell r_{2+3} aligned with dm-cu (Figs. 71–76). Apical brown band usually narrower than subapical hyaline band 16

16. Abdominal syntergite 1+2 and tergites 3 and 4 without brown markings on anterior half, each only with even brown band on posterior margin, band narrowed or narrowly interrupted medially. Scutum usually with sublateral vitta or row of spots, but without medial or submedial vittae or spots (excluding pair of spots or bands on posterior margin). Costa Rica ..... **n. sp.** #16, *poecilosoma* group

[This species, which breeds in male flowers of *Gurania makoyana* (Lemaire) Cogn. is included in the key because it is likely to be confused with species of the *femoralis* group due to its wing pattern.]

- Abdominal markings various, if brown marking(s) present posteriorly on tergites 3 and 4, extending anteriorly beyond midlength of tergite or tergite with additional spots or markings on anterior half. Scutum with medial or submedial vittae or spots if markings present 17

17. Scutum with 2–4 brown vittae, at least anterior to transverse suture, including pair of submedial brown vittae between acrostichal and dorsocentral lines (Figs. 95–97, 102–104). Aculeus tip without minute serrations on lobes, with broad medial concavity, and with 2 or 4 pairs of lobes, lateral lobe absent (Figs. 150–151) or if present, space between it and sublateral lobe very shallow (Fig. 171) or almost as broad as or broader than width of lateral lobe (Figs. 126–127). 18
- Scutum without markings, with 3 brown vittae or anterior spots (Figs. 90–93), including unpaired medial one and pair aligned with medial corner of postpronotal lobe, or with only latter pair. Aculeus tip either with minute serrations on lobes or without medial concavity; with large lateral lobe, space between it and sublateral lobe deep and narrower than lateral lobe (Figs. 128–129, 153–154, 161) 21

18. Scutum anterior to transverse suture with 1 submedial pair of brown vittae (Figs. 95–97); posterior margin with single broad brown mark, sometimes connected to submedial vittae or occasionally without brown markings. Abdomen with 1 pair of solid brown vittae, not extended to lateral margin (Fig. 124). Cell r_{2+3} without hyaline spot aligned with crossvein dm-cu and distal to basal marginal spot in cell r_1 (Figs. 15–20) 19
- Scutum anterior to transverse suture with 2 pairs of brown vittae (similar to Figs. 102–104), submedial pair sometimes weak; posterior margin with pair of brown marks. Abdomen brown laterally and each tergite with 1–2 pairs of isolated brown spots (at least submedial pair isolated). Cell r_{2+3} with large hyaline spot more or less aligned with crossvein dm-cu and distal to basal marginal spot in cell r_1 (Figs. 57, 71–76). 20

19. Scutum with submedial vittae not interrupted at transverse suture (Fig. 95). Scutellum entirely yellow or with single broad brown mark. Wing with apical brown band not narrowed in cell r_{2+3} or widened at vein R_{4+5} (Figs. 15–16). Aculeus with medial part (exclusive of lateral lobes) half as wide as aculeus, relatively produced (Fig. 126). Nicaragua, Costa Rica ..... *bivittata*, **n. sp.**
- Scutum with submedial vittae interrupted at transverse suture (Figs. 96–97). Scutellum entirely yellow or with pair of well separated brown spots. Wing with apical brown band usually narrowed in cell r_{2+3} or widened at vein R_{4+5} (Figs. 17–20). Aculeus with medial part (exclusive of lateral lobes) more than 0.6 times as wide as aculeus, relatively shallow (Fig. 127). Costa Rica to Peru ..... *brevivittata*, **n. sp.** (in part)

20. Wing with hyaline spot in cell r_{4+5} aligned slightly distal to crossvein dm-cu (Fig. 57). Aculeus with 2 pairs of lobes and shallow medial concavity (Figs. 150–151). Guatemala ..... *quetzali*, **n. sp.** (in part)
- Wing with hyaline spot in cell r_{4+5} aligned with or proximal to crossvein dm-cu (Figs. 71–76). Aculeus with 4 pairs of lobes and deep medial concavity (Fig. 171). Mexico ..... *variabilis*, **n. sp.** (in part)

21. Vertex yellow surrounding medial vertical seta. Aculeus tip with large concavity medially and 4 pairs of large lobes (Fig. 129). Costa Rica ..... *lutea*, **n. sp.**
- Vertex with brown spot or band surrounding medial vertical seta. Aculeus with projecting lobe medially, not concave (Figs. 128, 153–154, 161) 22

22. Wing with subapical hyaline band not extended anteriorly to vein R_{2+3} and cell r_1 without aligned posterior spot (Figs. 4, 25, 60). Aculeus tip with medial part (excluding lateral lobes) nearly semicircular or triangular, with minute serrations except on narrow, more projecting medial lobe (Figs. 128, 161) 23
- Wing with subapical hyaline band extended anteriorly at least to vein R_{2+3} and/or cell r_1 with aligned posterior spot

(Figs. 35–37). Aculeus tip with medial part truncate except for small, narrow, stepped medial lobe; width of medial lobe much less than width of flat area on each side of it (Figs. 153–154); without minute serrations except a few on extreme lateral corner of medial part and on lateral lobe. Venezuela, Guyana, Brazil ..... *hirsuta* Bates

23. Wing with subapical hyaline band not extended proximally beyond apex of proximal hyaline band originating in cell m (Figs. 4, 60). Aculeus tip with lateral lobe as broad as long, medial lobe two-thirds as long as wide (Fig. 161). Mexico to Costa Rica ..... *rupta* (Wulp)
- Wing with subapical hyaline band extended proximally beyond apex of proximal hyaline band originating in cell m (Fig. 25). Aculeus tip with lateral lobe longer than wide, medial lobe half as long as wide (Fig. 128). Costa Rica ..... *cornelli*, **n. sp.**
24. Wing with at least 1 uninterrupted subapical band (touching margin in both cells r_{2+3} and r_{4+5}) (Figs. 32–34, 44, 56, 61–62, 70) 25
- Wing without uninterrupted subapical band (Figs. 2–3, 8, 10–12, 24, 30–31, 43, 71–76) 32
25. Scutum with 2–4 brown vittae, at least anterior to transverse suture, including pair of submedial brown vittae between acrostichal and dorsocentral lines (Figs. 95–99, 102–104). 26
- Scutum without markings or with 3 brown vittae, including unpaired medial vitta and pair aligned with medial corner of postpronotal lobe (Figs. 90–93). 30
26. Cell r_{2+3} proximal to level of crossvein r-m with 1–2 large, quadrate hyaline to yellowish spots (Figs. 3, 43–44); hyaline areas in cells dm and cu_1 covering more than half of those cells. Occiput medially with pair of brown vittae (similar to Figs. 85, 87). Katatergite, anatergite and meron with brown markings. Costa Rica ..... *macwilliamsae*, **n. sp.** (in part)
- Cell r_{2+3} proximal to level of crossvein r-m entirely brown (Figs. 55–56, 61, 70); hyaline areas in cells dm and cu_1 covering less than half of those cells. Occiput with or without (Fig. 89) brown vittae. Katatergite, anatergite and meron without brown markings 27
27. Pterostigma without subapical hyaline spot (Fig. 57); cell r_{4+5} with posterior hyaline spot aligned with or connected to hyaline marks in cell m. Abdominal tergites with 2 pairs of small brown spots in addition to lateral and posterior markings (similar to Fig. 114). Mid and hind femora with elongate anteroventral and posteroventral brown marks on distal 1/5–1/4. Aculeus tip subtriangular, with 4 lobes and shallow medial concavity (Figs. 150–151). Guatemala ..... *quetzali*, **n. sp.** (in part)
- Pterostigma with subapical hyaline or pale brown spot (Figs. 55–56, 61, 70); cell r_{4+5} without posterior hyaline spot aligned with hyaline marks in cell m. Abdominal tergites with 1 pair of large brown spots or vittae, sometimes with additional lateral markings (Figs. 123–125). Mid and hind femora without elongate anteroventral and posteroventral brown marks on distal 1/5–1/4. Aculeus tip with 5–8 lobes, often with convex medial lobe (Figs. 160, 162, 164)..... 28
28. Cell r_{2+3} with 2 apical hyaline marks, proximal one extending into cell r_{4+5} (Figs. 55–56). Cell r_1 often with subapical hyaline spot. Aculeus tip (Fig. 160) gradually narrowing to nearly straight medial part, with small acute lateral lobes; length of lobed part more than half its width. Mexico to Costa Rica; possibly Colombia ..... *quadristriata* Wulp (in part)
- Cell r_{2+3} with only 1 apical hyaline mark (Fig. 70) or if 2 present, proximal one not extending into cell r_{4+5} (Fig. 61). Cell r_1 without subapical hyaline spot. Aculeus tip (Figs. 162, 164) broad and truncate, with relatively narrow projecting medial part; length of lobed or stepped part less than 1/3 its width. 29
29. Cell r_{2+3} with only 1 apical hyaline mark (Fig. 70). Aculeus tip (Fig. 164) with lateral lobe gradually rounded. Ecuador ..... *unifasciata*, **n. sp.**
- Cell r_{2+3} with 2 apical hyaline marks (Fig. 61). Aculeus tip (Fig. 162) with lateral lobe forming nearly 90° angle. Ecuador; possibly Costa Rica ..... *ruptafascia*, **n. sp.**
30. Cell r_1 without subapical hyaline spot (Fig. 34). Proximal marginal hyaline mark in cell r_{2+3} not extending into cell r_{4+5}. Panama, Colombia ..... sp. nr. *furcifer*
- Cell r_1 with subapical hyaline spot (Figs. 32–33, 62). Proximal marginal hyaline mark in cell r_{2+3} extending into cell r_{4+5} 31
31. Aculeus tip with 1 pair of strong lobes laterally, medial part step-like (Figs. 157–158). Cell c with 2 small circular hyaline spots separated by broad brown medial area, usually with hyaline streak through it (Figs. 32–33). Venezuela to Bolivia and Brazil ..... *furcifer* Hendel
- Aculeus tip with 7 strong, deep lobes (Fig. 163). Cell c with 1 elongate, diffuse hyaline spot or 2 spots narrowly separated by pale brown medial area (Fig. 62). Peru, Bolivia ..... *septemdigitata*, **n. sp.**
32. Cells br, dm and cu_1 with single large medial hyaline area without brown spots within it, connected to or narrowly separated along vein R_{4+5} proximal to r-m from basal marginal mark in radial cells (Figs. 6–7, 45); crossvein r-m more than 0.65 distance from bm-cu to dm-cu 33
- Cells br, dm and cu_1 with multiple hyaline spots or large medial hyaline area with brown spots within it, usually

broadly separated along vein R_{4+5} basal to r-m from basal marginal mark in radial cells (Figs. 3, 10–12, 23–24, 30–31, 43–44, 46–50, 55–59, 67–68); crossvein r-m usually less than 0.60 distance from bm-cu to dm-cu (sometimes > 0.60 in *B. chaconi*, *nigriapex* and *mikenoltei*) 34

33. Aculeus tip tapered basolaterally, elongate triangular (lobed part 0.59 times as long as wide), particularly medial and submedial lobes (Fig. 165); medially with narrow V-shaped notch. Argentina ..... *amplihyalina*, **n. sp.**
- Aculeus tip angular basolaterally, short triangular (lobed part 0.39 times as long as wide), lobes similar in size and evenly spaced (Fig. 166); medially with moderately broad, shallow apical concavity. Argentina..... *marshalli*, **n. sp.**
34. Anepisternum with brown spot dorsal or posterodorsal to anterior seta (Fig. 107). Cell m with 3 marginal hyaline spots (Figs. 2, 8, 12, 38–39, 49–50). Scutellum with single medial spot 35
- Anepisternum without brown spot dorsal to anterior seta (Fig. 108). Cell m with 2 marginal hyaline spots (Figs. 3, 23–24, 43–44, 46–48, 55–59, 67–68). Scutellum markings variable, sometimes entirely yellow or with 2 spots 39
35. Hind femur entirely yellow or at most narrowly brown on anteroventral and posteroventral apical ridges (Fig. 112). Cell dm with largest hyaline area narrower than that in cell cu_1 and usually extending anteriorly less than 2/3 of distance across cell (Figs. 2, 8, 12, 38–39, 49)..... 36
- Hind femur with entire distal 1/6 brown. Cell dm with largest hyaline area as broad as that in cell cu_1 and extending anteriorly to or almost to vein M (Fig. 50). Bolivia..... *nigriapex*, **n. sp.**
36. Cell r_1 with 2 narrow basal marginal hyaline spots crossing cell, divided by narrow brown to yellow area (Figs. 12, 49). Aculeus apex with distinct medial concavity (Fig. 167) or small rounded medial lobe (Fig. 131) 37
- Cell r_1 with 1 broad quadrate basal marginal hyaline spot crossing cell (Figs. 2, 8, 38–39). Aculeus apex with slight notch in small, almost truncate medial lobe (Figs. 132–134) 38
37. Anepimeron with small medial brown spot. Aculeus apex with small rounded medial lobe (Fig. 131). Ecuador .... *bipunctata*, **n. sp.**
- Anepimeron entirely yellow. Aculeus apex with distinct medial concavity (Fig. 167). Ecuador .... *multipunctata*, **n. sp.**
38. Cell dm with posteromedial hyaline spot relatively small, less than 0.20 times as long as cell along vein Cu_1, without anterodistal extension or narrowly separated moderately large hyaline spot (Figs. 38–39). Aculeus tip with lobed part 0.38–0.41 times as long as wide, gap between lateral and sublateral lobes less than 0.85 times as long as wide (Fig. 134). Bolivia..... *hyalinella*, **n. sp.**
- Cell dm with posteromedial hyaline spot larger, more than 0.25 times as long as cell along vein Cu_1, with anterodistal extension or narrowly separated moderately large hyaline spot (Figs. 2, 8). Aculeus tip with lobed part 0.58–0.72 times as long as wide, gap between lateral and sublateral lobes more than 1.40 times as long as wide (Fig. 132–133). Bolivia..... *apaapa*, **n. sp.**
39. Hind femur brown on apical fourth. Cell r_1 with 2 distinctly separated marginal hyaline areas immediately distal to apex of vein R_1 (Figs. 5, 77). Cells r_{2+3} and r_{4+5} each with 2 small marginal or submarginal hyaline spots, anterior spot in r_{2+3} extending less than third of distance to vein r_{4+5}. Aculeus tip with 7 lobes, including unpaired medial lobe, 2 pairs of step-like lobes, and broad, digitiform pair of lateral lobes (Fig. 155). Ecuador..... *wasbaueri*, **n. sp.**
- Hind femur apically at most with elongate anteroventral and posteroventral brown marks or with brown spot. Cell r_1 with single narrow or broad hyaline area immediately distal to apex of vein R_1, or if with 2 distinctly separated marks, cells r_{2+3} and r_{4+5} with marginal hyaline spots larger (Fig. 40). Aculeus tip variable. 40
40. Cell r_1 with 1–2 hyaline areas distal to apex of vein R_1, basal hyaline area narrow or strongly tapered posteriorly (Figs. 30–31, 55–56, 67–68, 71–76). Vertex often with brown spot or band surrounding medial vertical seta (Figs. 86, 88–89) 41
- Cell r_1 with 3 or more hyaline areas distal to apex of vein R_1, or if with only 2, basal hyaline area broad or not strongly tapered posteriorly (Figs. 10–11, 23–24, 40, 43–44, 46–48, 58–59). Vertex without brown area surrounding medial vertical seta (Fig. 87)..... 46
41. Pterostigma without subapical hyaline spot (Figs. 57, 71–76). Cell r_{2+3} with only 1 marginal hyaline mark, at apex of vein R_{2+3}. Cell r_1 rarely with subapical hyaline spot. Aculeus tip with weak lobes and medial concavity (Figs. 150–151, 171). 42
- Pterostigma with subapical hyaline spot (Figs. 30–31, 55–56, 67–68). Cell r_{2+3} with 2 marginal hyaline marks. Cell r_1 usually with subapical hyaline spot. Aculeus tip with more acute, produced lobes and with or without medial concavity (Figs. 156, 160) 43
42. Wing with hyaline spot in cell r_{4+5} aligned slightly distal to crossvein dm-cu (Fig. 57). Aculeus with 2 pairs of lobes and shallow medial concavity (Figs. 150–151). Guatemala ..... *quetzali*, **n. sp.** (in part)
- Wing with hyaline spot in cell r_{4+5} aligned with or proximal to crossvein dm-cu (Figs. 71–76). Aculeus with 4 pairs of lobes and deep medial concavity (Fig. 171). Mexico..... *variabilis*, **n. sp.** (in part)
43. Cell r_{4+5} with 2 apical hyaline spots or single bilobed spot (Fig. 67–68). Scutum with pair of submedial dark brown vittae connected to large triangular brown mark on posterior margin (Fig. 94). Southern Brazil..... *thetis* Hendel

- Cell r_{4+5} with 1 apical hyaline spot (Figs. 30–31, 55–56). Scutal and scutellar markings various 44

44. Scutum with sublateral and submedial brown vittae or marks (Figs. 98–99). Cell r_{4+5} with straight extension of proximal marginal hyaline mark in cell r_{2+3} (Figs. 55–56). Lobed part of aculeus tip more than half as long as wide (Fig. 160). Mexico to Costa Rica; possibly Colombia ..... *quadristriata* Wulp (in part)
- Scutum anteriorly at most with submedial vittae or spots, without sublateral brown vittae or marks (except mark on posterior margin sometimes narrowly reaching lateral margin). Cell r_{4+5} with spot aligned between marginal hyaline marks in cell r_{2+3} or with these marks somewhat fused into inverted-V (Figs. 30–31). Lobed part of aculeus tip less than 1/4 as long as wide (Fig. 156) (unknown in sp. nr. *thetis*) 45

45. Posterior margin of scutum and mediotergite yellow. Aculeus tip broad and short, with broad medial concavity (Fig. 156). Venezuela, northern Brazil..... *fernandezi*, **n. sp.**
- Posterior margin of scutum with large dark brown trapezoidal mark. Mediotergite with pair of brown vittae. Female unknown. Bolivia ..... sp. nr. *thetis*

46. Scutellum with pair of submedial dark brown spots or single inverted U-shaped or inverted triangular mark 47
- Scutellum entirely yellow 49

47. Cell r_1 with 3 subequal, evenly spaced, marginal hyaline marks, basal 2 sometimes narrowly connected anteriorly (Fig. 40). Cell R_{4+5} without hyaline spots aligned anteriorly with hyaline marks in cell m. Thorax without brown spots on notopleuron or anterior to postsutural supra-alar seta. Mexico ..... *io* Giglio-Tos
- Cell r_1 with basal marginal hyaline mark much larger than the 1–5 distal spots that are usually unevenly spaced and sometimes do not reach anterior margin (Figs. 10–11, 23–24). Cell R_{4+5} with hyaline spots or mark aligned anteriorly with hyaline marks in cell m. Thorax with brown spot lateral to posterior notopleural seta and another anterior to postsutural supra-alar seta.. 48

48. Cell r_{4+5} with 1–2 hyaline spots proximal to dm-cu and another aligned with hyaline marks in cell m, each at least half as wide as cell, and with at most 1 spot touching apical margin (Figs. 23–24). Cell dm with large hyaline area in basal 3/4 at least half as long as cell. Medial occipital sclerite with submedial pair of brown vittae on ventral half (Fig. 87). Anepimeron with brown spot or larger mark on posterior half (Fig. 108). Aculeus without digitiform lateral lobe (Fig. 149). Costa Rica ..... *chaconi*, **n. sp.**
- Cell r_{4+5} with variable number of hyaline spots proximal to or aligned with hyaline marks in cell m, none more than 1/3 as wide as cell, and with 2 spots touching apical margin (Figs. 10–11). Cell dm with 1–3 hyaline areas in basal 3/4, together less than half as long as cell. Medial occipital sclerite without submedial brown markings (although lateral margin may be narrowly brown along suture). Anepimeron entirely yellow. Aculeus with digitiform lateral lobe (Figs. 152, 172). Southern Brazil ..... *bidigitata*, **n. sp.**

49. Cell dm with hyaline spots in proximal 2/3 fused or faintly separated (Figs. 3, 43–44, 46–47, 58–59). Basal marginal hyaline mark in cell r_1 at least as wide as long. Aculeus less than 3 times as long as wide 50
- Cell dm with hyaline spots in proximal 2/3 relatively small and well separated (Fig. 48). Basal marginal hyaline mark in cell r_1 narrow, longer than wide. Aculeus 3.4 times as long as wide, tip truncate, shallowly stepped, medially with broad, shallow concavity (Fig. 168). Costa Rica ..... *mikenoltei*, **n. sp.**

50. Cell r_{4+5} with hyaline spot closest to dm-cu slightly proximal to crossvein and large, at least 3/4 width of cell or fused with subbasal spot to form 1 extremely large and broad hyaline area (Figs. 58–59). Aculeus tip rounded laterally, lobes small and restricted to middle third, lateral margin with minute serrations (Fig. 170). Mexico ..... *regina* Giglio-Tos
- Cell r_{4+5} with hyaline spot closest to dm-cu often aligned with or distal to crossvein and smaller, at most half width of cell, always separate from subbasal spot (Figs. 3, 43–44, 46–47). Aculeus tip more truncate, lobes well spaced, lateral margin without minute serrations (Fig. 130, 146–148) 51

51. Cell r_1 distally usually with 1–2 small marginal hyaline spots, rarely extending to vein R_{2+3}, and without isolated posterior spots (Fig. 46–47). Aculeus tip shallowly lobed, medially with shallow concavity (Figs. 146–148). Mexico, Guatemala ..... *mexicana*, **n. sp.**
- Cell r_1 distally with 1–3 small pale posterior spots, subapical one rarely extending to costal margin (Figs. 3, 43–44). Aculeus tip distinctly lobed, medially with small convex lobe (Fig. 130). Costa Rica ..... *macwilliamsae*, **n. sp.** (in part)

***Blepharoneura amplihyalina* Norrbom & Condon, new species**

Figs. 6–7, 165, 200

Diagnosis. This species and *B. marshalli* differ from other species of *Blepharoneura* by the extremely large hyaline area in cells dm and cu_1 that completely lacks brown spots within it and from most other species by

the distal location of crossvein r-m, which is more than 0.65 of the distance from bm-cu to dm-cu (this distance exceeds 0.60 only in some *B. zumbadoi*, *chaconi*, *nigriapex* and *mikenoltei*). *Blepharoneura amplihyalina* differs from *B. marshalli* in the shape of the aculeus, the tip of which is elongate triangular with weak step-like lobes and a strong narrow notch in the medial lobe. In *B. marshalli* the tip is shorter, with more angular and evenly spaced lobes, and the medial apical concavity is broader and shallower.

Description. Head: Dark brown area on ocellar tubercle extended less than half to half distance to postocellar seta. Medial occipital sclerite with pair of pale brown to dark brown submedial vittae on ventral half. Occipital suture narrowly orange brown to dark brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta interrupted or narrowed posterior to transverse suture, well separated from marks on posterior margin; sublateral vitta with presutural part usually complete, extended to or almost to level of supra-alar seta, postsutural part elongate, reduced to spot posterior to transverse suture, or absent; posterior margin with 2 well separated brown marks. Notopleuron usually with brown vitta on lateral margin, reduced to anterior and posterior spots in holotype. Small brown spot anterior to postsutural supra-alar seta, brown spot anterior to postalar seta, and small brown spot lateral to dorsolateral corner of scutellum present. Sometimes small spot lateral to postsutural supra-alar spot (aligned with postalar spot) also present. Scutellum with single medial spot, usually not extended beyond basal half, not extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, sometimes moderately broad but not reaching lateral margin of mediotergite. Pleuron entirely or mostly yellow. Anepisternum sometimes with small brown spot dorsal to anterior seta (1♂, faint on left side in holotype). Anatergite with small dorsomedial red brown or brown spot. Basalare with brown spot or entirely brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Entirely yellow.

Wing (Figs. 6–7): Length 6.05–7.20 mm, width 2.75–3.40 mm, ratio 2.12–2.39. Crossvein r-m at 0.70–0.73 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted triangular hyaline spots, both reaching costa and subcosta; medial brown area sometimes fading posteriorly, anterior part as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, slightly narrower to broader than hyaline spots. Pterostigma with pale brown subapical spot [#3], sometimes small (2 of 4 specimens), not reaching R_1 in 1 specimen. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–3 (usually 2–3) and 1–3 hyaline spots, respectively. Radial cells medially with broad basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1 and aligned broad hyaline mark [fused #8 and #9] in cell r_{2+3} forming tapering triangular to quadrate mark broadly touching R_{4+5}; cell r_{4+5} with hyaline spot [#15] near anterior end of dm-cu small to moderate sized, sometimes almost touching vein M, aligned with or slightly proximal or distal to dm-cu, and also with additional tiny hyaline to pale brown spots, 0–4 on or near anterior margin and 1–2 on or near posterior margin. Distally cell r_1 sometimes (2 of 4 specimens) with 1 small marginal hyaline spot [#6], usually with 1–2 small pale brown posterior spots (absent in 1 wing of holotype). Cell r_{2+3} with 2 marginal hyaline marks, brown area between them sometimes (1♂) pale and diffuse, proximal mark [#10] extending to vein R_{4+5} or divided into marginal and posterior spots, distal mark [#11] sometimes small and not reaching R_{4+5}. Cell r_{4+5} usually with small hyaline spot [#16] anteriorly (absent on 1 wing of 1♂), aligned between apical marks in cell r_{2+3} or with distal mark; with small posterior hyaline spot aligned with hyaline mark in cell m; and with 1 small ovoid marginal or submarginal hyaline spot [#18], rarely with second more anterior spot [#18A] (left wing of Villa Padre Monti ♂). Cell m usually (3 of 4 specimens) with small subbasal hyaline spot [#49] near midlength of dm-cu; with large irregular or posteriorly forked medial hyaline mark [fusion of at least #26A, #26, #27, #28 and sometimes #29], sometimes with isolated small distal marginal spot [#29], or with 3 marginal spots, medial one [fusion of at least #26A, #26, #28] largest, somewhat mushroom-shaped, narrow posteriorly, broad anteriorly and extending to vein M. Cell br with subbasal pale brown spot [#12]. Cell bm with single broad hyaline area [fused #19, #20]. Cell bcu occasionally with small pale brown spot in lobe. Cell bcu occasionally with small pale brown spot in lobe. Posteromedial part of wing with extremely large subrectangular hyaline area; cell br with broad rectangular subapical hyaline area [at least #13, possibly fused

with #44] extending from anterior to posterior margin, sometimes with small to minute pale brown spot well proximal to broad subapical hyaline area; cell dm with large hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50] aligned with hyaline area in cell cu_1, anteriorly extending to at least level of r-m, distal margin transverse or slightly oblique; cell cu_1 with hyaline area covering medial half or more [broad fusion of at least #31, #32, #33, #34, #36, #36A], very broad on posterior wing margin, sometimes with diffuse faint brown submarginal spot subbasally but without other brown spots medially; subapical marginal hyaline spot [#37] small to moderate sized, usually not reaching vein Cu_1. Cell dm without usual subapical hyaline spot [#25] (unless fused with large medial hyaline area), occasionally with small more distal medial hyaline spot (1♂) or small more distal posterior hyaline spot [#53] (1 wing of holotype) more or less aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow. Syntergite 1+2 with 4 evenly spaced dark brown spots, submedial and sublateral spots occasionally connected, and with spot on posterolateral corner; other tergites with 4 rows of evenly spaced spots, anterolateral spot touching or almost touching lateral margin, and L-shaped band or pair of spots on lateral and posterior margins, separated medially, on tergite 5 and sometimes tergites 3–4 connected to anterolateral spot, lateral margin always with at least small spot on tergite 3 but entirely brown on tergite 5; submedial and sublateral spots on tergite 4 sometimes connected; and some or all spots and bands on tergite 5 often connected or occasionally largely fused except medially.

Female terminalia: Oviscape length 1.10 mm. Aculeus (Fig. 165) 0.56 mm long, 2.04 times as long as wide, medial membrane without scales dorsally and ventrally; tip tapered basolaterally, elongate triangular (lobed part 0.59 times as long as wide), with large medial lobe with narrow but deep V-shaped notch (notch 1/3 as deep as length of lobe) and 3 pairs of small, somewhat step-like lobes separated by shallow gaps; sublateral and submedial lobes similar in size. Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta two-thirds as large to subequal to medial prensiseta (Fig. 200).

Distribution. Northwestern Argentina (Tucumán). The type specimens for which elevation data were provided by the collectors were taken at 700 and 2000 m elevation.

Type data. Holotype ♀ (IML USNMENT00213857), ARGENTINA: Tucumán: La Angostura [26°55'S 65°41'W], 2000 m, 17 Feb 1953, P. Arnau. Paratypes: ARGENTINA: Tucumán: Burruyacu, Villa Padre Monti [26°29'S 64°58'W], 18 Jan - 7 Feb 1948, R. Golbach, 1♂ (USNM USNMENT00213859); c. 12 km W of Tucumán, Horco Molle, 700 m, Malaise trap, 18–21 Mar 1974, C. R. Vardy, 1♂ (BMHN USNMENT00213855); La Angostura, 2000 m, 17 Feb 1953, P. Arnau, 1♂ (IML USNMENT00213856).

Etymology. The name of this species is an adjective referring to the extremely large hyaline area in cells dm and cu_1.

***Blepharoneura apaapa* Norrbom & Condon, new species**
Figs. 2, 8, 107, 112, 132–133

Diagnosis. This species resembles *B. amplihyalina*, *bipunctata*, *hyalinella*, *multipunctata* and *nigriapex* in having a dark brown spot posterodorsally on the anepisternum, a single medial brown spot on the scutellum, and 3 hyaline marginal spots in cell m. It differs from *B. bipunctata* and *multipunctata* in having a single broad marginal hyaline mark basally in cell r_1. It differs from the other three species in the size of the posteromedial hyaline area in cell dm, which is smaller than in *B. nigriapex* and *amplihyalina*, but larger than in *B. hyalinella*. It has a more elongate aculeus tip than in *B. nigriapex* and *hyalinella*, and the sublateral lobe is much closer to the submedial lobe than to the lateral lobe compared to *B. amplihyalina*, in which these lobes are more evenly spaced.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Medial occipital sclerite with pair of brown to dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Postpronotal lobe mostly yellow, with small dark brown spot at junction with anepisternum and often with larger, diffuse brown spot on posterolateral margin. Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta interrupted at transverse suture, posterior part complete to level of intra-alar seta or reduced to anterior spot or short vitta, separated from mark on posterior margin; posterior margin with 2 broad quadrate dark brown marks, usually narrowly separated but occasionally narrowly connected posteriorly. Notopleuron with lateral margin dark brown or mostly brown except for small pale spot surrounding posterior seta. Small dark brown spot anterior to postsutural supra-alar seta, large dark brown spot lateral to postsutural supra-alar seta, large dark brown spot anterior to postalar seta, and large dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single small to moderate sized basomedial brown spot. Subscutellum and mediotergite with pair of moderately broad dark brown vittae, mediotergite also with lateral margin of at least ventral half narrowly brown. Pleuron (Fig. 107) mostly yellow. Anepisternum with dark brown spot dorsal to anterior seta. Anepimeron usually with small medial brown spot, but often faint (distinct in 3, faint in 5 of 11 specimens). Anatergite with large dorsomedial dark brown mark, sometimes extending to posterodorsal margin. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Anteroventral apical ridge of mid femur and/or anteroventral basal ridge of mid tibia dark brown. Anteroventral and posteroventral ridges of hind femur and/or anteroventral and posteroventral basal ridges of hind tibia dark brown (Fig. 112).

Wing (Figs. 2, 8): Length 8.1–9.1 mm, width 3.8–4.2 mm, ratio 2.10–2.23. Crossvein r-m at 0.54–0.57 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline to subhyaline spots, both reaching costa and subcosta but fading to pale brown posteriorly or sometimes with narrow pale brown posterior margin; medial brown area paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, slightly broader than basal hyaline spot and usually as broad as to slightly broader than distal spot. Pterostigma with large hyaline to pale brown subapical spot [#3], usually reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 3–4 and 3–5 pale brown spots, respectively. Radial cells medially with 1 broad quadrate or inverted trapezoidal basal hyaline mark [#5 fused with additional spot?] in cell r_1, sometimes fading to pale brown posteriorly; cell r_{2+3} with 1–2 hyaline to pale brown spots [#8, #9] posterior to r_1 mark, basal spot often slightly proximal, distal spot often moderately broad but rarely extended more than halfway across cell, not reaching R_{4+5}, cell medially with additional tiny pale brown spots near margins; cell r_{4+5} usually with small pale brown spot [#14?] anteriorly or medially and aligned with r_1 mark, with small hyaline spot [#15] aligned with or slightly proximal to or rarely (1 wing of 1 specimen) slightly distal to dm-cu, and also with additional tiny pale brown spots, 3–5 on or near anterior margin and 3–6 on or near posterior margin. Distally cell r_1 with 1 [#6] or usually 2 small marginal hyaline spots, usually also with 1–2 small pale brown posterior spots. Cell r_{2+3} with 2 small to elongate marginal hyaline marks [#10, 11], rarely connected (1 specimen), distal one occasionally not extending to vein R_{4+5}, proximal mark sometimes (3 of 12 specimens) divided into marginal spot and spot near or touching R_{4+5}. Cell r_{4+5} usually with small hyaline spot [#16] anteriorly, rarely absent, aligned between apical marks in cell r_{2+3} or with more distal mark; usually with small posterior hyaline spot aligned with medial spot(s) in cell m; and with 1–2 small marginal spots [#18, #18A], more anterior spot [#18A] occasionally absent (1 specimen) or fused to posterior spot to form C-shaped mark or single very broad mark (2 specimens). Cell m with small subbasal hyaline spot [#49] near midlength of dm-cu and usually (8 of 11 specimens) with additional tiny spot near anterobasal corner; with 3 large marginal hyaline spots [proximal #27, distal #29], medial spot [fused #28, #26, and often #26A and/or more distal anterior spot] largest, extending over at least posterior 2/3 of cell and usually (10 of 12 specimens) to or almost to vein M (if fused with anterior spot(s)), and often (6 of 12 specimens) connected away from margin

with proximal spot [#27]. Cell br with subbasal pale brown spot [#12]. Cell bm with circular subbasal and subapical hyaline or pale brown spots [#19, #20]. Cell bcu with small hyaline or pale brown spot in lobe, often extending anteriorly into cell cu_1 or that cell with similar nearby spot. Posteromedial part of wing with very large hyaline area; cell br subapically with hyaline spot [#13] and small to minute, much more proximal pale brown spot; cell dm with 2–5 small subbasal spots, usually pale brown, and large ovoid medial posterior hyaline mark [fusion of #22, #23, #24] (0.25–0.33 times as long as cell along vein Cu_1) much shorter than hyaline mark in cell cu_1 and aligned with its distal half; cell cu_1 with very large hyaline area covering medial half or more [broad fusion of at least #32, #33, #34, #35?, #36, #36A], very broad on posterior wing margin, with subbasal submarginal brown spot and often 1 submarginal diffuse pale brown spot, but lacking pale brown spot anteriorly; subapical marginal hyaline spot [#37] small to moderate sized, not reaching vein Cu_1. Cell dm with subapical hyaline spot [#25] moderate sized, isolated (4 of 12 specimens) or often fused to posteromedial spot to form anterodistal extension, and with 1 anterior, usually 1 [#53] posterior (absent on 1 wing of 3 specimens), and usually 1 medial (8 of 12 specimens) smaller more distal spots, the anterior and posterior spots aligned or nearly aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow, with 4 rows of evenly spaced dark brown spots; tergites 3–5 also with anterolateral spot touching or almost touching lateral margin; also with pair of spots or more commonly with them connected to form L-shaped band on posterior margin and posterolateral corner of all tergites, separated medially, on tergites 3–6 extending anteriorly on lateral margin, rarely connected to anterolateral spot, but lateral margin always partially yellow at least on tergites 3 and 4; submedial spots occasionally connected to sublateral spots on syntergite 1+2, and some or all spots on other tergites occasionally connected to posterior bands or spots.

Female terminalia: Oviscape entirely dark brown; length 1.72–1.82 mm. Aculeus (Figs. 132–133) 1.10 mm long, 2.00–2.12 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, elongate triangular (lobed part 0.58–0.72 times as long as wide), with small, truncate or notched medial lobe and 3 pairs of step-like lobes separated by relatively deep gaps; sublateral lobe slightly larger than submedial lobe; lateral gap 1.48–1.55 times as long as wide. Spermathecae subspherical, with slightly convoluted, slender sclerotized neck and small to large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta subequal to medial prensiseta.

Distribution. Bolivia. The type locality is a remnant of Yungas forest. The specimens were collected at 2000–2050 m elevation.

Type data. Holotype ♀ (ANCB USNMENT00055947), BOLIVIA: La Paz: Apa Apa Reserve, upper trail in primary forest, 16°21'15S 67°30'20W, 2000 m, log site, cloudy AM or late afternoon, on undersides of leaves of undetermined Cucurbitaceae (01–Bol-01) or supporting understory plant Solanaceae sp. (01–Bol-03), 1–3 Apr 2001, A. L. Norrbom. Paratypes: Same data as holotype, 1♂ (ANCB USNMENT00055926) 1♂ (CDFA USNMENT00055945) 1♂ (FSCA USNMENT00055946) 1♂ (TAUI USNMENT00055932) 4♂3♀ (USNM USNMENT00055934, USNMENT00055937, USNMENT00055941–44).

Etymology. The name of this species is a noun in apposition that refers to the type locality.

Biology. The digestive tract of a dissected female [USNMENT00055937] was green, indicating that adults of this species rasp leaves or some other nonfloral part of its host plant.

Blepharoneura aspiculosa Norrbom & Condon, new species

Figs. 9, 136

Diagnosis. This species, *B. splendida*, *sinepuncta*, and *punctistigma* differ from other *Blepharoneura* species in having the thoracic pleuron largely brown, the apical fourth or more of the hind femur dark brown, and the distal part of the wing with oblique bands. *Blepharoneura aspiculosa* is very similar to *B. punctistigma*. It

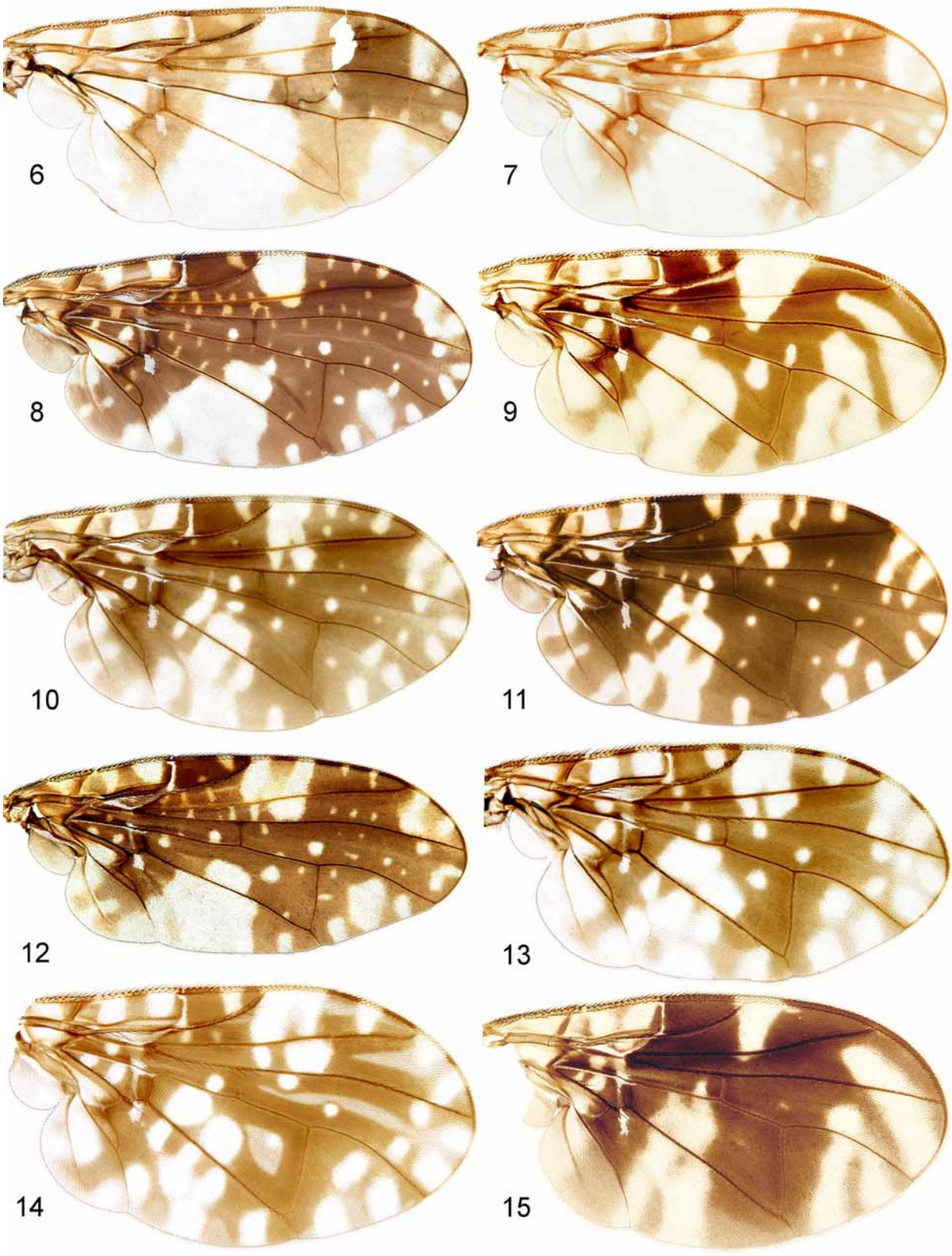
differs by aculeus shape (apex slightly more elongate, steps shallower) and lack of medial scales; the hyaline subapical band not constricted along vein R_{4+5}; and cell dm with a single very long and broad hyaline area in the basal 3/4 (the narrowest part extends 3/4 of distance to anterior margin of cell; *B. punctistigma* usually has 2 separate hyaline areas). These two species differ from *B. splendida* and *sinepuncta* by their markings in cell dm (subapical spot [#25] isolated and distal to posterior spot aligned with r-m [#24]) and the pterostigma (always with a subapical spot, which is absent in *B. sinepuncta* and usually absent in *B. splendida*). The aculeus tip differs from those of *B. splendida* and *sinepuncta* in having shallower gaps between the lobes.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of pale brown submedial vittae on ventral half. Occipital suture narrowly dark brown, on lateral side bordered by triangular brown area extending to postocular setae, not including lateral vertical seta.

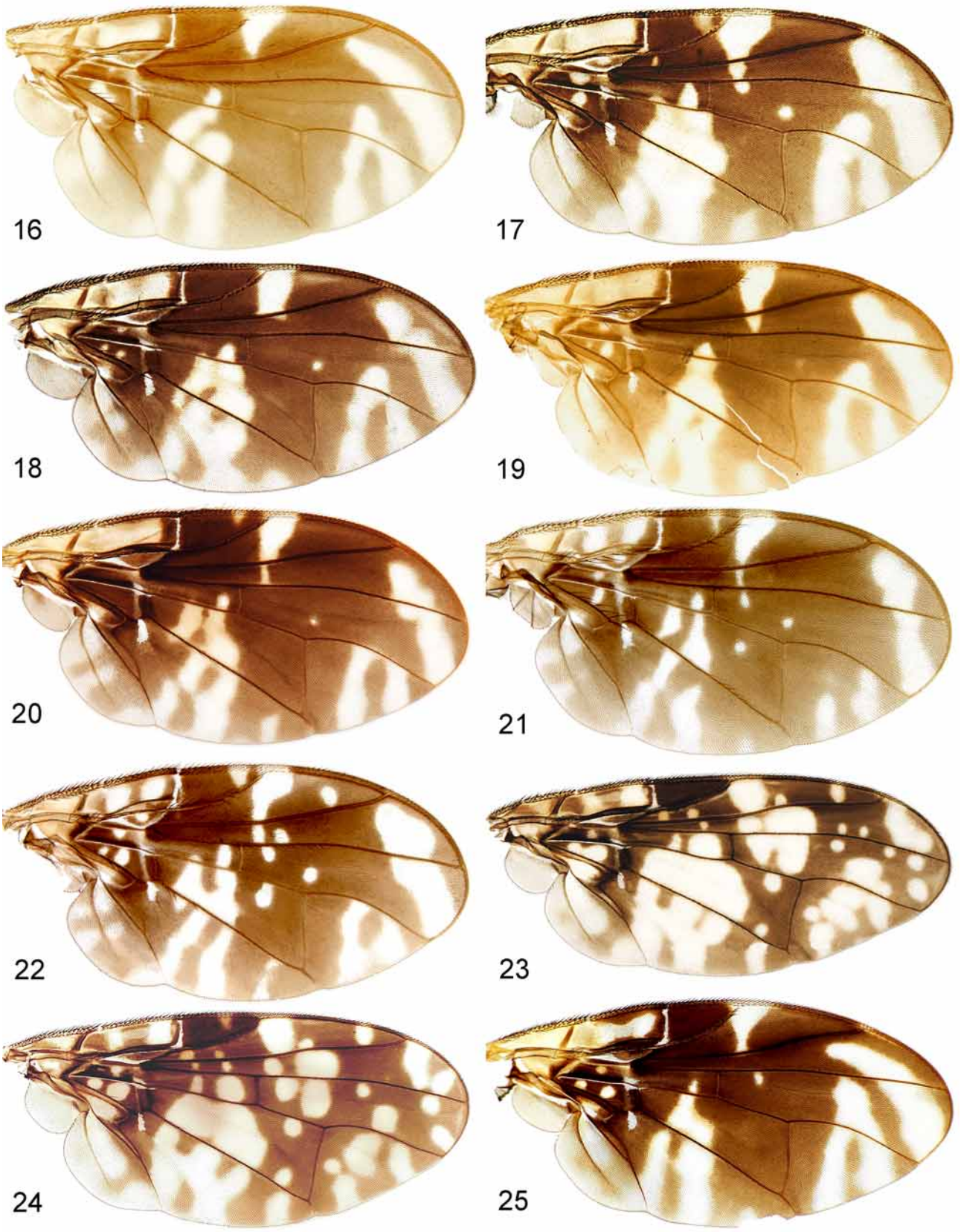
Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta narrowed and almost interrupted posterior to transverse suture and separated from mark on posterior margin; sublateral vitta interrupted at transverse suture, narrowly connected to mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially. Notopleuron brown except for small pale area surrounding posterior seta. Small brown spot anterior to postsutural supra-alar seta faint, diffuse. Brown vitta anterior to postalar seta present. Brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single somewhat inverted U-shaped medial brown mark extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, extended along lateral margin on ventral half of mediotergite. Pleuron mostly dark brown, yellow only on propleuron, anterior margin of anepisternum and broadly bordering phragma, all of katepimeron, greater ampulla, and dorsal margins of anepimeron and anatergite. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur with anteroventral and posteroventral brown marks on apical 2/5. Hind femur with entire apical 1/4–1/2 dark brown.

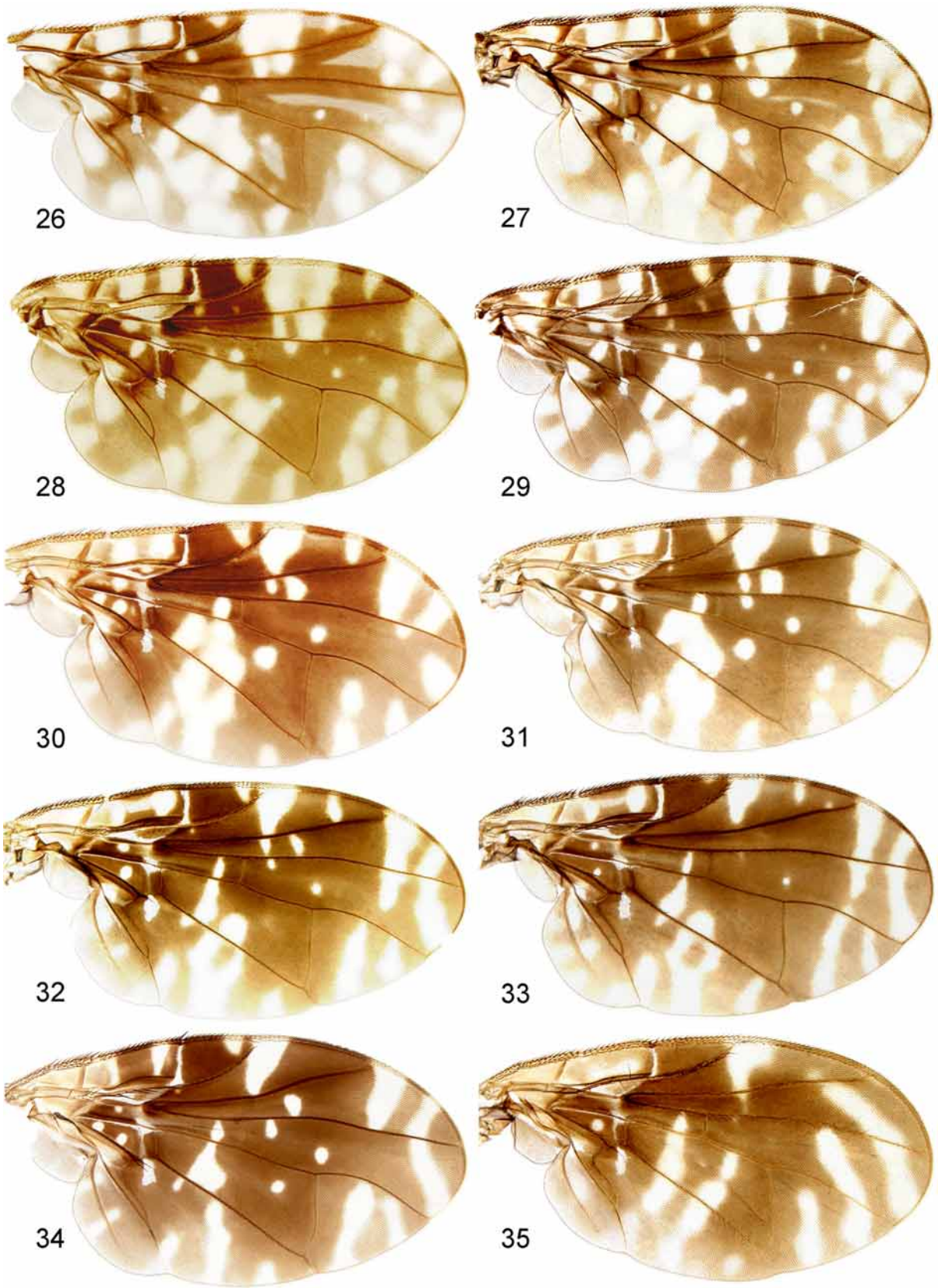
Wing (Fig. 9): Length 6.40 mm, width 3.05 mm, ratio 2.10. Crossvein r-m at 0.57 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, narrower than both hyaline spots. Pterostigma with large subapical hyaline to pale brown spot [#3] reaching R_1. Cell r_1 basally (proximal to apex of R_1) with 1 pale brown to hyaline spot posterior to apex of vein Sc; cell r_{2+3} basally with 1 spot. Radial cells medially with broad tapering basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1 and aligned spots in r_{2+3} [#8] and r_{4+5} [#14] forming acute triangular mark, extended slightly into r_{4+5}; cell r_{4+5} with hyaline spot [#15] near anterior end of dm-cu extending to vein M. Distally cell r_1 without hyaline spots [#6], and cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending parallel to costa to or almost to vein R_{2+3}, not extended into cell r_1, not constricted along vein R_{4+5}, tapering anteriorly, broader than marginal brown area. Cells m and r_{4+5} with inverted V-shaped hyaline mark [fusion of at least #26A, #26, #27, #29], extending anteriorly to vein R_{4+5}, both arms reaching margin in cell m. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu with hyaline spot in lobe. Anal lobe hyaline except brown area from apical part of lobe of cell bcu and base of vein A_1+Cu_2 to apex of vein A_2. Posteromedial part of wing with large, broad hyaline areas; cell br with isolated subapical hyaline spot [#13]; cell dm with very long and broad hyaline mark [fused #51, #52, #21, #22, #23, #24] aligned with large hyaline mark in cell cu_1, longer posteriorly than anteriorly, proximal part extended to anterior margin, distal part extended 3/4 of distance to margin; cell cu_1 with very broad Y-shaped mark [#32, #33, #36] nearly fused proximally with mark across vein A_1+Cu_2 [fused #34, #39] isolating 1 small anterior and 1 small submarginal brown spot; subapical marginal hyaline spot [#37] large, reaching vein Cu_1. Cell dm with anterior subapical hyaline spot [#25?] isolated and distal to proximal mark, extending to vein M.



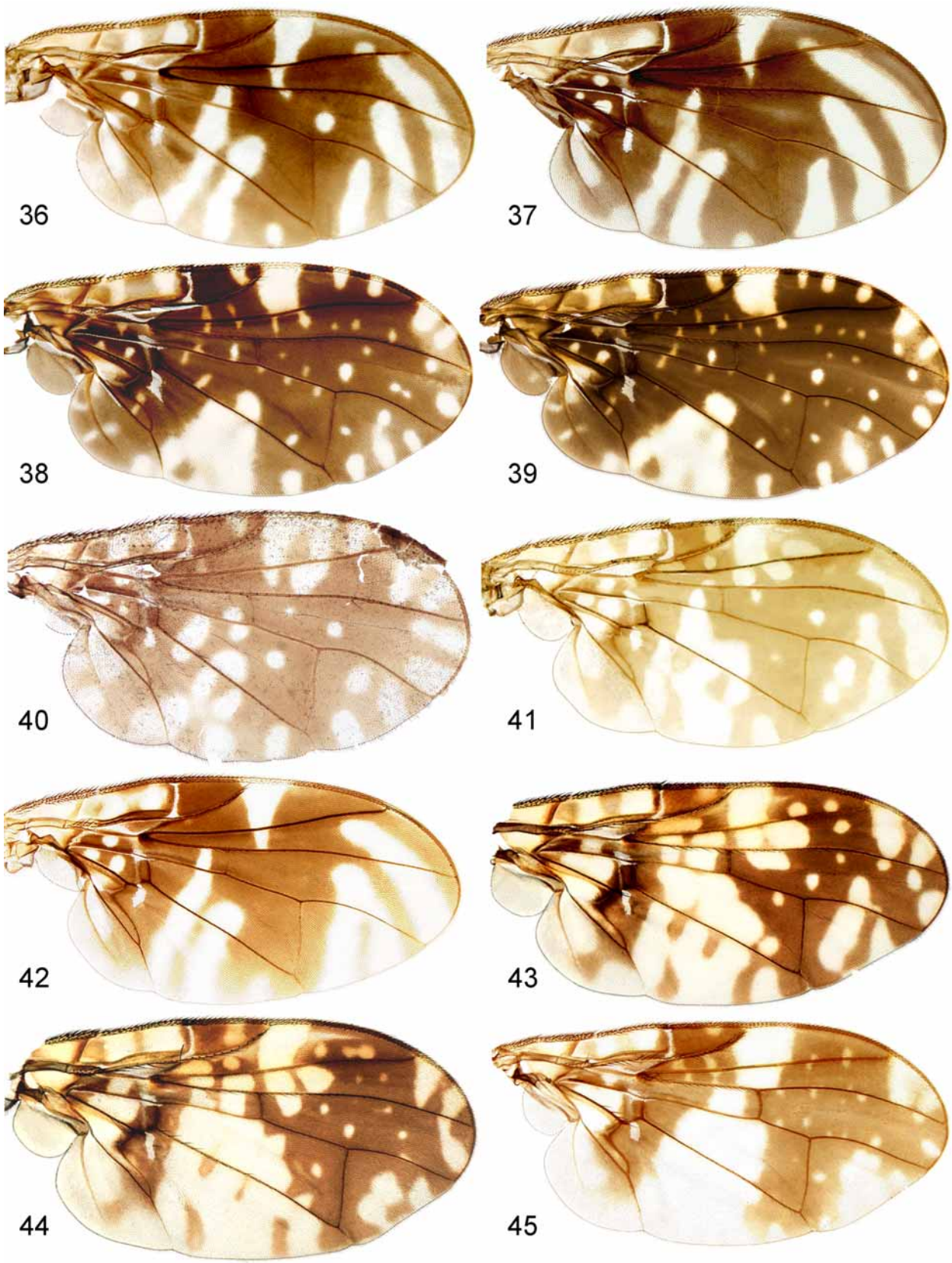
FIGURES 6–15. Wing: 6–7, *B. amplihyalina* (Argentina: Horco Molle, USNMENT00213855; Villa Padre Monti, USNMENT00213859); 8, *B. apaapa* (Bolivia: Apa Apa, USNMENT00055943); 9, *B. aspiculosa* (Mexico: El Triunfo, USNMENT00213912); 10–11, *B. bidigitata* (Brazil: Nova Teutonia, USNMENT00213906; Interlagos, USNMENT00213839); 12, *B. bipunctata* (holotype); 13, *B. biseriata* (Mexico: Huipulco, USNMENT00213948); 14, *B.* sp. nr. *biseriata* (Mexico: E El Palmito, USNMENT00213947); 15, *B. bivittata* (holotype).



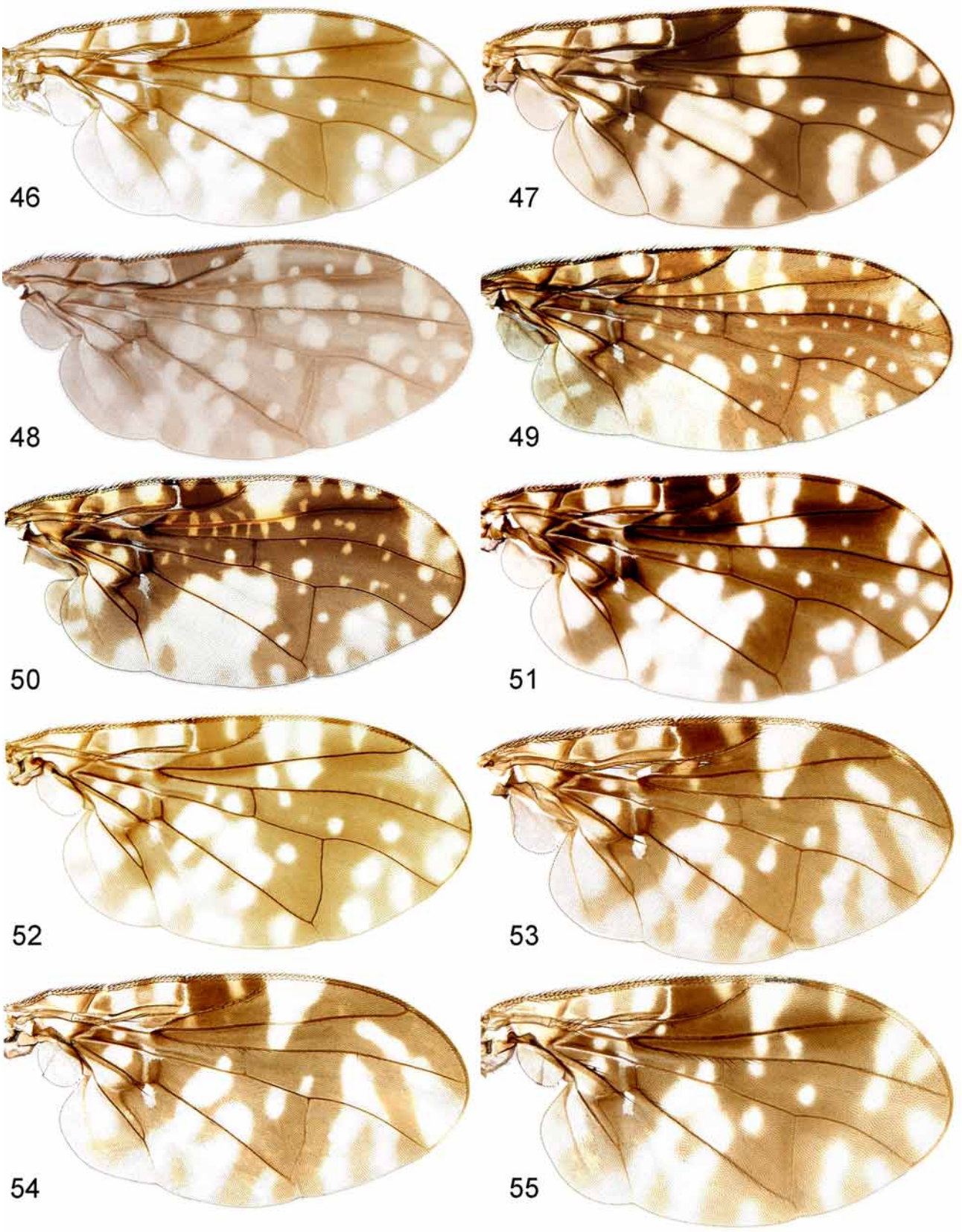
FIGURES 16–25. Wing: 16, *B. bivittata* (Costa Rica: S Upala, USNMENT00213822); 17–20, *B. brevivittata* (Costa Rica: Golfo Dulce, USNMENT00048492, USNMENT0000048516; Panama: Cano Saddle, USNMENT00213935; Peru: Tingo Maria, USNMENT00213533); 21–22, *B.* sp. nr. *brevivittata* (Peru: Pakitza, USNMENT00213931; Brazil: Santarém, USNMENT00213932); 23–24, *B. chaconi* (Costa Rica: San Gerardo, USNMENT00048385–86); 25, *B. cornelli* (holotype).



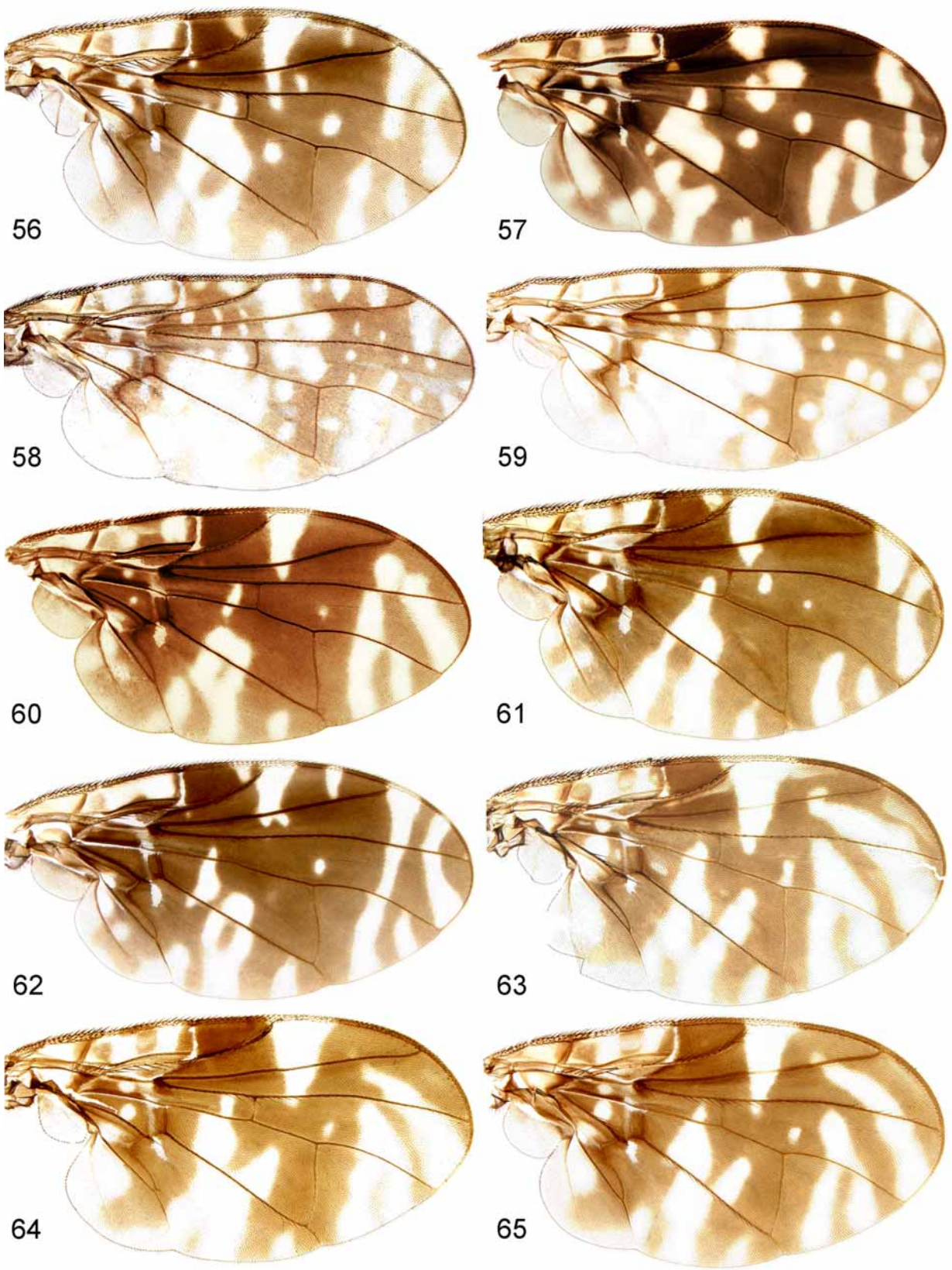
FIGURES 26–35. Wing: 26, *B. cyclantherae* (Mexico: Rt. 95, USNMENT00052304); 27–29, *B. femoralis* (Mexico: El Triunfo, USNMENT00213770; Brazil: Nova Teutonia, USNMENT00213754, USNMENT00052306); 30–31, *B. fernandezi* (Venezuela: El Limon, USNMENT00213886; Cumbre Roja, USNMENT00213885); 32–33, *B. furcifer* (Ecuador: Limoncocha, USNMENT00213928; Bolivia: San Carlos, USNMENT00213926); 34, *B.* sp. nr. *furcifer* (Panama: Barro Colorado USNMENT00213930); 35, *B. hirsuta* (Venezuela: Guatopo, USNMENT00213792).



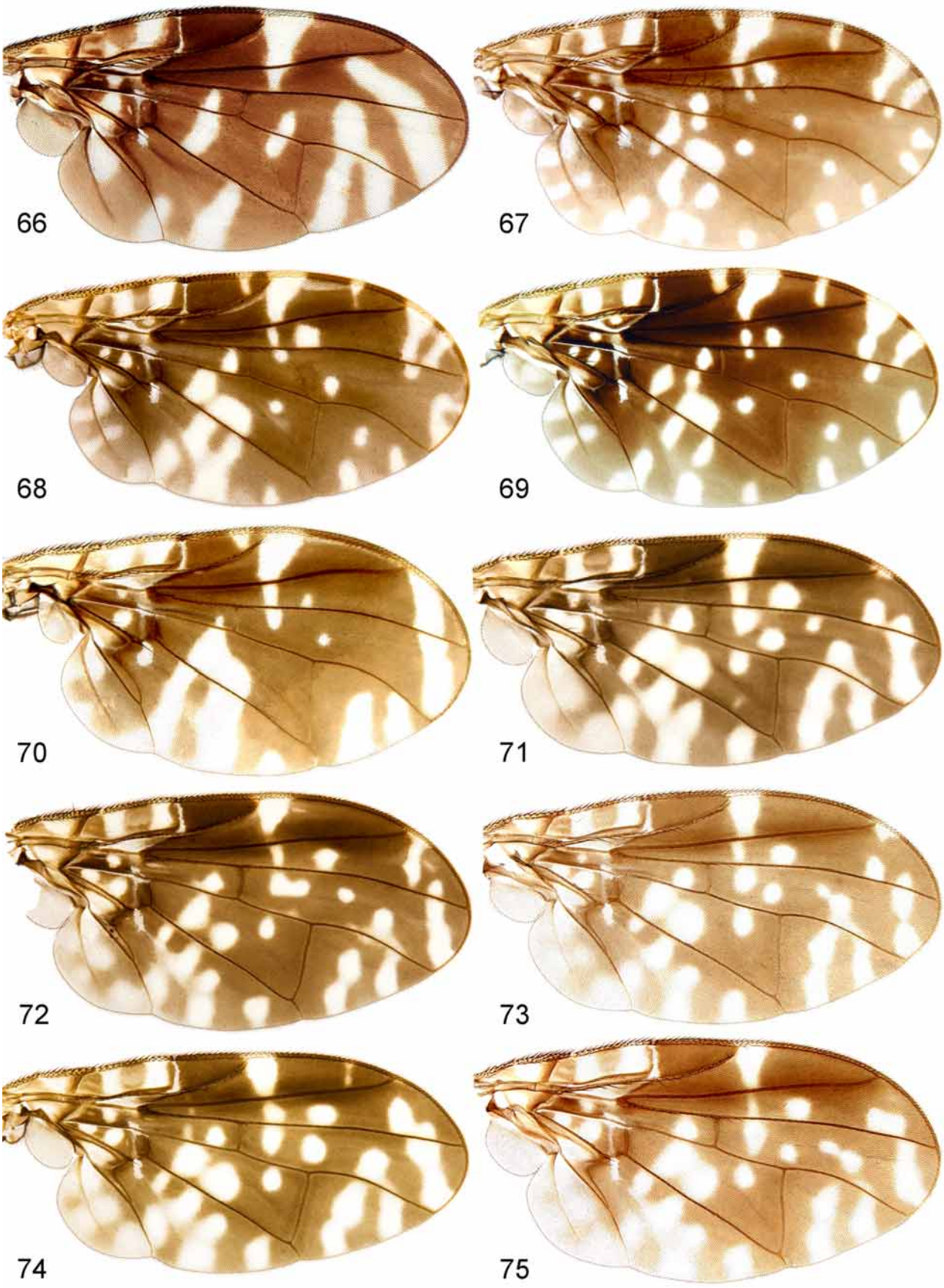
FIGURES 36–45. Wing: 36–37, *B. hirsuta* Guyana: Moraballi Creek, USNMENT00213793; Brazil: Rio de Janeiro, USNMENT00213794); 38–39, *B. hyalinella* (Bolivia: Apa Apa, USNMENT00055933, USNMENT00055940); 40, *B. io* (holotype); 41, *B. isolata* (holotype); 42, *B. lutea* (Costa Rica: SW Rincon, USNMENT00213791); 43–44, *B. macwilliamsae* (Zurqui, USNMENT00048601, USNMENT00048483); 45, *B. marshalli* (Argentina: Yuto, USNMENT00213860).



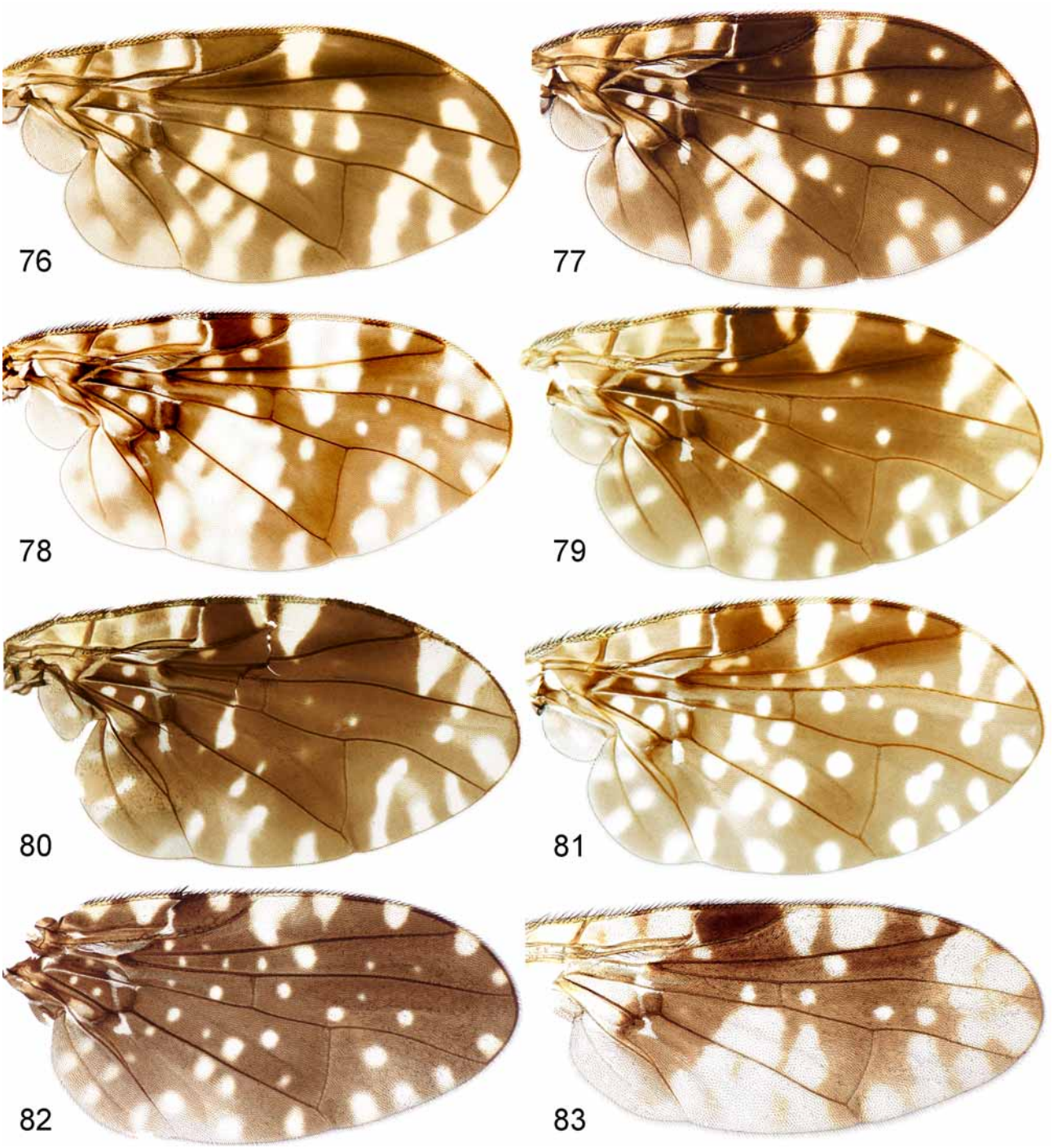
FIGURES 46–55. Wing: 46–47, *B. mexicana* (Mexico: S Chapingo, USNMENT00213806; holotype); 48, *B. mikenoltei* (holotype); 49, *B. multipunctata* (holotype); 50, *B. nigriapex* (Bolivia: Apa Apa, USNMENT00055930); 51, *B. nigrifemur* (Bolivia: Apa Apa, USNMENT00055923); 52, *B. osmundsonae* (Mexico: El Yukon, USNMENT00213961); 53–54, *B. punctistigma* (Mexico: Los Tuxtlas, USNMENT00213875; El Triunfo, USNMENT00213913); 55, *B. quadristriata* (Mexico: Los Tuxtlas, USNMENT00213849).



FIGURES 56–65. Wing: 56, *B. quadristriata* (Mexico: Los Tuxtlas, USNMENT00054201); 57, *B. quetzali* (holotype); 58–59, *B. regina* (lectotype; Mexico: Lagunas de Zempoala, USNMENT00213847); 60, *B. rupta* (lectotype); 61, *B. ruptafascia* (holotype); 62, *B. septemdigitata* (Peru: Pakitza, USNMENT00213939); 63, *B. sinepuncta* (Costa Rica: La Suiza, USNMENT00213918); 64–65, *B. splendida* (Guatemala: Pacayal, USNMENT00213874; Venezuela: Rancho Grande, USNMENT00213864).



FIGURES 66–75. Wing: 66, *B. tau* (holotype); 67–68, *B. thetis* (holotype; Brazil: Nova Teutonia, USNMENT00213840); 69, *B.* sp. nr. *thetis* (Bolivia: Arroyo Tuhiri, USNMENT00056566); 70, *B. unifasciata* (holotype); 71–75, *B. variabilis* (Mexico: El Triunfo, USNMENT00213889, USNMENT00213893–96).



FIGURES 76–83. Wing: 76, *B. variabilis* (Mexico: El Triunfo, USNMENT00213897); 77, *B. wasbaueri* (Ecuador: Huahua Sumaco, USNMENT00104212); 78, *B. zumbadoi* (Costa Rica: San Gerardo, USNMENT00048392); 79, *B. diva* (Costa Rica: Agua Buena, USNMENT00212445); 80, *B. pulchella* (holotype, Mexico: Teapa); 81, *Blepharoneura* sp. #50 (Ecuador: Tandapi, USNMENT00213798); 82, *Hexaptilona hexacinioides* (Taiwan: 45 km E Taichung); 83, *Baryglossa trulla* (Uganda: Ruwenzori Range, Fort Portal).

Abdomen: Syntergite 1+2 with pair of isolated submedial spots and irregular marks formed by sublateral spots connected to posterolateral band. Tergites 3–5 with isolated pairs of submedial, sublateral, and anterolateral brown spots and posterolateral brown bands.

Female terminalia: Oviscape entirely dark brown; length 1.05 mm. Aculeus (Fig. 136) 0.70 mm long, 2.23 times as long as wide, without scales dorsally and ventrally on membrane medially; tip angular basolaterally,

moderately long triangular (lobed part 0.55 times as long as wide), with small, convex medial lobe and 3 pairs of step-like lobes separated by shallow gaps; sublateral and submedial lobes similar in size; lateral gap 1.54 times as long as wide. Spermathecae subspherical, with nearly straight, slender sclerotized neck and large cylindrical basal apodeme.

Distribution. Known only from the type locality in the Sierra Madre de Chiapas, Mexico.

Type data. Holotype ♀ (USNM USNMENT00213912), MEXICO: Chiapas: 49 km S of Jaltenango, [Parque Natural] El Triunfo [15°40'N 92°48'W], 1300–2000 m, 13–15 May 1985, A. Freidberg.

Etymology. The name of this species is an adjective formed from the Latin a- (without) and spica (point) in reference to the lack of acute scales medially on the aculeus.

Blepharoneura bidigitata Norrbom & Condon, new species

Figs. 10–11, 111, 152, 172

Blepharoneura sp. 9: Norrbom & Condon 1999: 146.

Diagnosis. This species differs from other species of *Blepharoneura* by the following combination of characters: Anepisternum, anepimeron, and meron without brown markings; scutellum dorsally with pair of brown spots; cell r_{2+3} with 2 marginal hyaline marks; cell r_{4+5} with 2 ovoid marginal hyaline spots, neither extending to vein R_{2+3}, and with posterior hyaline spot(s) aligned with hyaline marks in cell m. The aculeus is similar to that of *B. hirsuta* (which is dissimilar in external characters), with the digitate lateral lobe and acute sublateral lobe well separated from the medial and submedial lobes by a broad straight area.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Occipital suture narrowly dark brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta strongly narrowed or interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta broadly interrupted at transverse suture, presutural part sometimes present only bordering postpronotal lobe, postsutural part sometimes absent, if present separated from marks on posterior margin; posterior margin with 2 quadrate dark brown marks. Notopleuron with small to large dark brown spot near posterior seta on lateral margin. Small brown spot anterior to postsutural supra-alar seta present, in one specimen fused to vitta anterior to postalar seta. Brown vitta (1 specimen), 2 spots (1 lateral to supra-alar seta) (2 specimens), or 1 spot (1 specimen) usually present anterior to postalar seta, absent on 1 specimen (posterior part not visible in 3 other specimens, but they lack anterior spot at least). Dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of submedial brown spots. Subscutellum and mediotergite with pair of pale to dark brown vittae, sometimes reaching lateral margin of mediotergite, or rarely (1♂) both sclerites yellow except dorsolateral brown mark on subscutellum. Pleuron mostly or entirely yellow. Katatergite occasionally (2 of 9 specimens) brown on posterodorsal 2/5–3/5. Anatergite often (5 of 9 specimens) with small to large medial or anteromedial brown mark. Basalare with brown spot, occasionally faint. Dorsocentral seta aligned with or usually slightly posterior to postalar seta.

Legs: Mostly or entirely yellow. Hind femur (Fig. 111) often (3 of 8 specimens distinctly, 2 weakly) with dark red brown spot on or very slightly separated from anterior or anteroventral apical margin [not just on anteroventral ridge, more extensive, usually extending almost to anterodorsal side].

Wing (Figs. 10–11): Length 7.05–7.71 mm, width 3.30–3.80 mm, ratio 1.91–2.14. Crossvein r-m at 0.52–0.60 distance from bm-cu to dm-cu. Cell c with 2 broad rectangular to trapezoidal hyaline spots, both reaching costa and subcosta; medial brown area distinctly paler than area of cell r_1 posterior to pterostigma, sometimes faint medially, almost as broad as to distinctly narrower than both hyaline spots. Pterostigma with subapical hyaline spot [#3] usually reaching R_1 (small in 1 specimen). Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–2 and 0–2 hyaline spots, respectively. Radial cells medially with 1 moderately broad basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1, partially divided posteriorly by brown spot touching

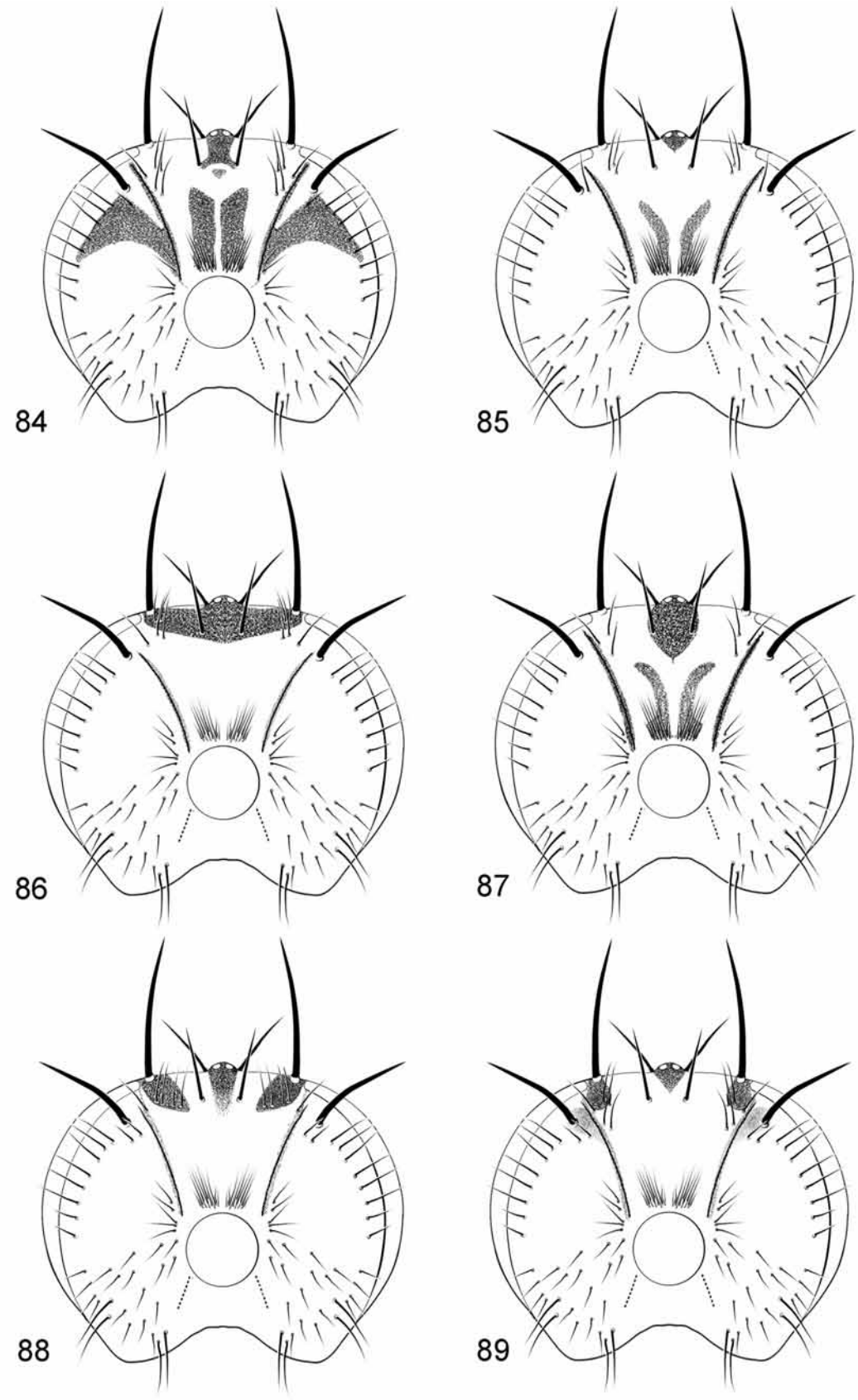
r_{2+3}, or rarely (1 wing of 1 specimen) with brown area narrowly separating large anterior and small posterior hyaline marks, the latter not reaching costa; cell r_{2+3} with 2 hyaline spots [#8, 9] aligned with lobes of r_1 mark, distal spot [#9] broader; cell r_{4+5} with small hyaline spot [#14] in anterior half aligned between lobes of r_1 mark, with small hyaline spot [#15] aligned with or slightly distal to dm-cu, and often (6 of 8 specimens) with additional tiny hyaline to pale brown spots, 0–4 near anterior margin, 0–3 near posterior margin. Distally cell r_1 with 1–3 (usually 2) small marginal hyaline spots [#6 and additional spots], sometimes also with 1–2 small hyaline or pale brown posterior spots. Cell r_{2+3} with 2 large marginal hyaline marks [#10, #11], both extending to vein R_{4+5}. Cell r_{4+5} with 1–2 small hyaline spots [1 of them #16?] anteriorly, aligned with or between apical marks in cell r_{2+3}; with 0–2 minute to moderate sized ovoid posterior hyaline spots aligned with hyaline marks in cell m; and with 2 large ovoid marginal hyaline spots [#18 and #18A]. Cell m usually with small subbasal hyaline spot [#49] near midlength of dm-cu, occasionally with second more anterior spot; and with 3 large ovoid hyaline spots, 2 marginal [#27, #29] and 1 elongate anteromedial spot [fused #26, #26A], often (5 of 8 specimens) reaching vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal hyaline spot [#19] small or usually absent, subapical circular hyaline spot [#20] moderate sized to large. Posteromedial part of wing with multiple large hyaline spots or markings; cell br subapically with hyaline spot [#13], often with slightly more proximal yellowish or hyaline spot [#44], and occasionally with additional more proximal yellowish spot; cell dm with subbasal elongate hyaline mark across cell [fused #51, #52], posteriorly aligned with spot in cell cu_1 [#31] and anteriorly aligned with spot in cell br [#44] when latter present, medially often connected to more distal spots; with anterior spot [#21] aligned with subapical spot in cell br [#13], often fused with subbasal mark or posterior hyaline spot of varying length [fusion of #23 and #22 and/or #24] aligned with all of or middle and either branch of Y-shaped mark in cell cu_1; cell cu_1 usually with broad Y-shaped medial mark [fused #32, #33, #36, sometimes #36A], occasionally (2 specimens) with proximal branch [#32] or (1 specimen) distal branch [#33] narrowly separated from base [#36], aligned with posteromedial spot in cell dm to isolate brown spot anteriorly in cell cu_1, proximal branch of mark [#32] aligned slightly distal to line from proximal marginal mark across vein A_1+Cu_2 [#34, #39] to subapical spot in cell br [#13], base of Y-shaped mark sometimes broad [fused #36, #36A] and partially divided by pale brown marginal spot; subapical marginal hyaline mark [#37] moderate sized. Cell dm with subapical spot [#25] usually hyaline and moderate sized to small, occasionally minute, pale brown or absent; sometimes (3 specimens) also with small to minute posterior subapical hyaline or pale brown spot [#53] aligned with or slightly proximal to subapical mark in cell cu_1 touching or almost touching vein Cu_1.

Abdomen: All tergites with 4 evenly spaced dark brown spots, sublateral pair sometimes absent on syntergite 1+2, and 2 pairs of spots (more medial pair sometimes absent on syntergite 1+2) or pair of posterolateral dark brown bands on posterior margin, on tergites 3–5 L-shaped but lateral margin yellow anteriorly, bands separated medially except sometimes on tergite 5; sublateral spot sometimes connected to posterior band on tergites 3 or 4, and both pairs sometimes connected to band on tergite 5.

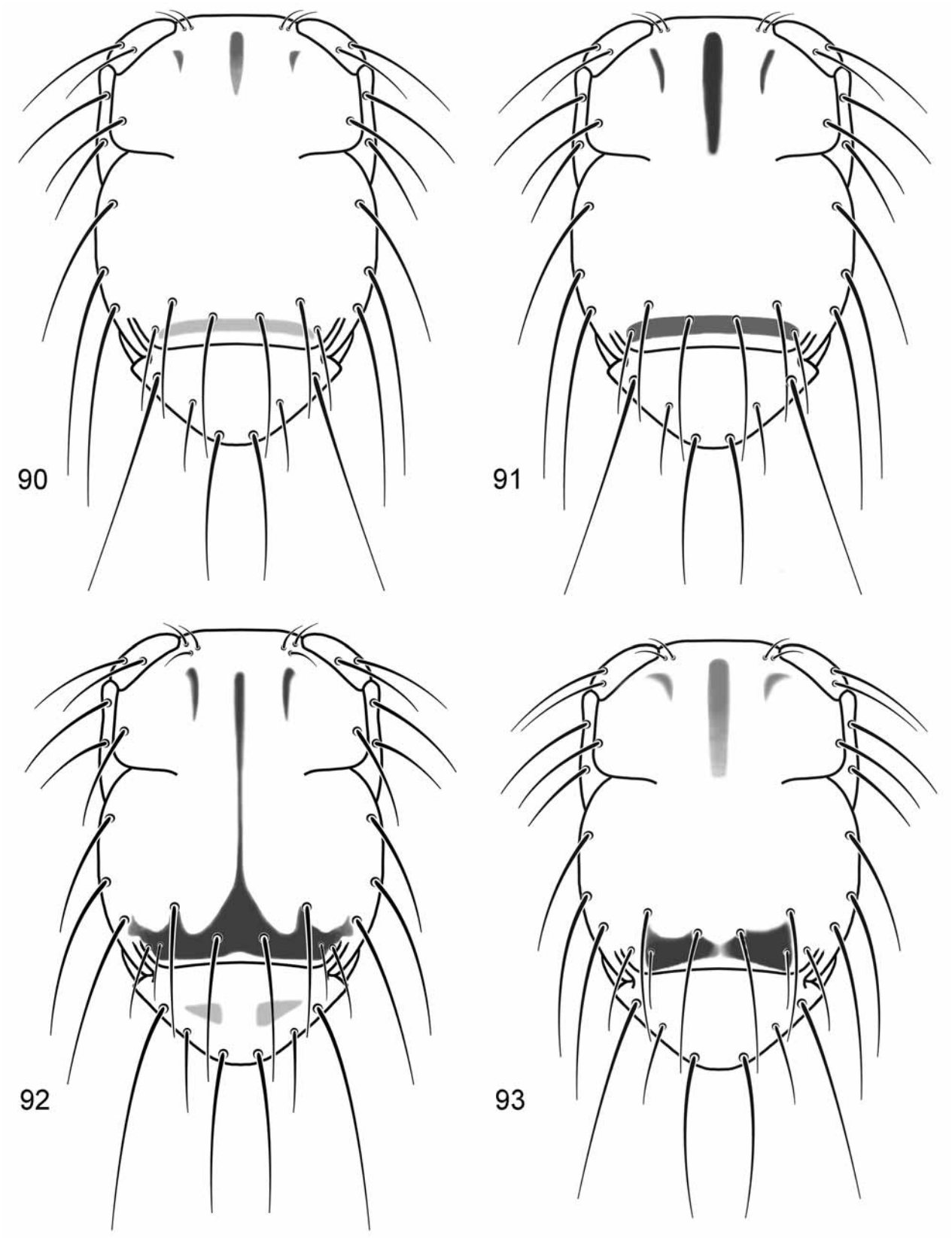
Female terminalia: Oviscape entirely dark brown; length 1.10–1.20 mm. Aculeus (Figs. 152, 172) 0.89–0.96 mm long, 2.04–2.10 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip flared outward basolaterally, short (lobed part 0.20–0.29 times as long as wide), with small, convex or very weakly trilobed medial lobe and 3 pairs of lobes, lateral lobe large and digitiform, with minute serrations apically, sublateral lobe large and acute, submedial lobe very small, separated from sublateral lobe by broad transverse area (width of submedial and medial lobes together 0.29–0.38 distance between apices of sublateral lobes). Spermathecae subspherical, with slightly convoluted, slender sclerotized neck and small cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta small, less than one-third as wide as medial prensiseta.

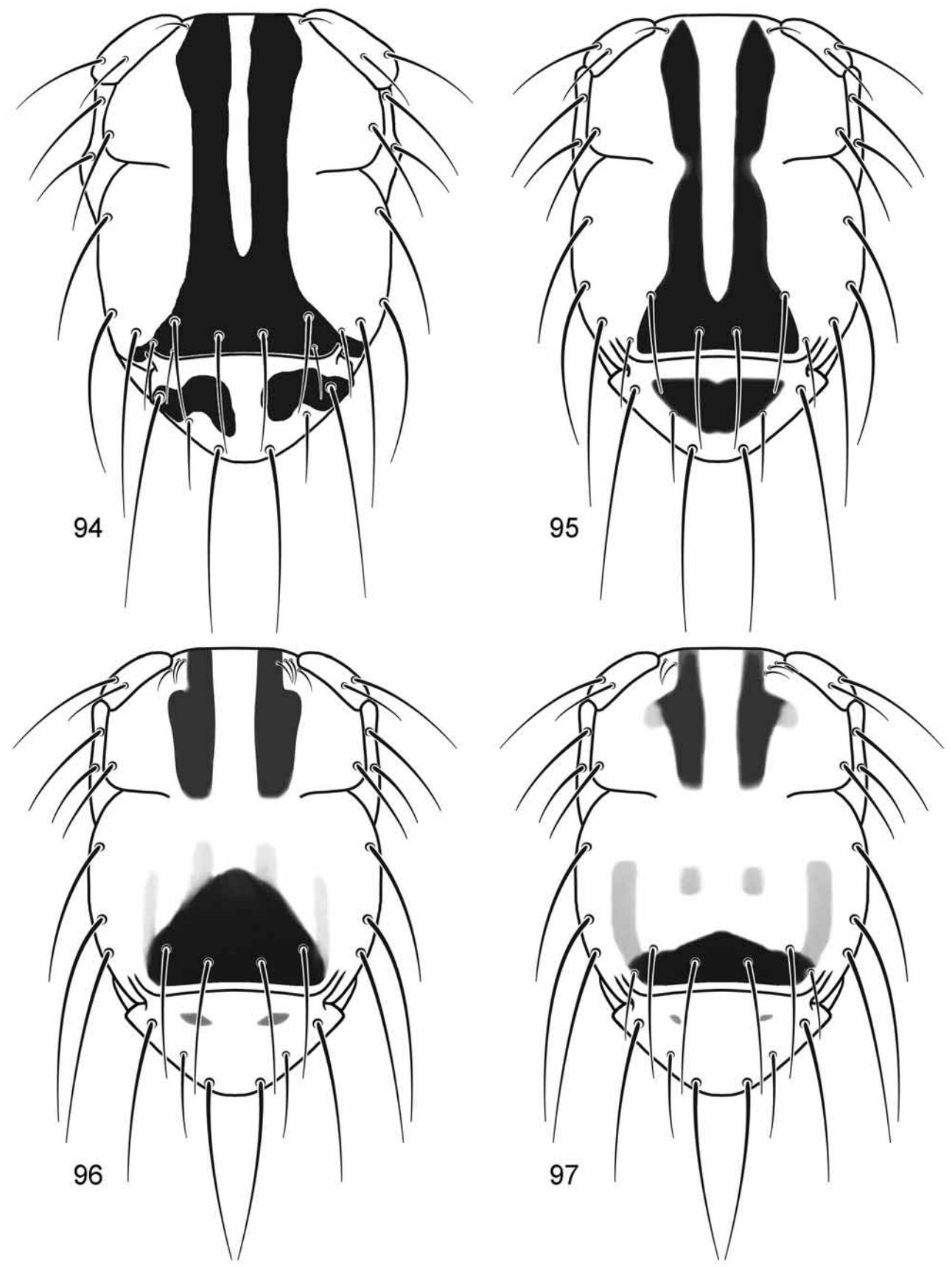
Distribution. Southern Brazil (São Paulo, Santa Catarina).



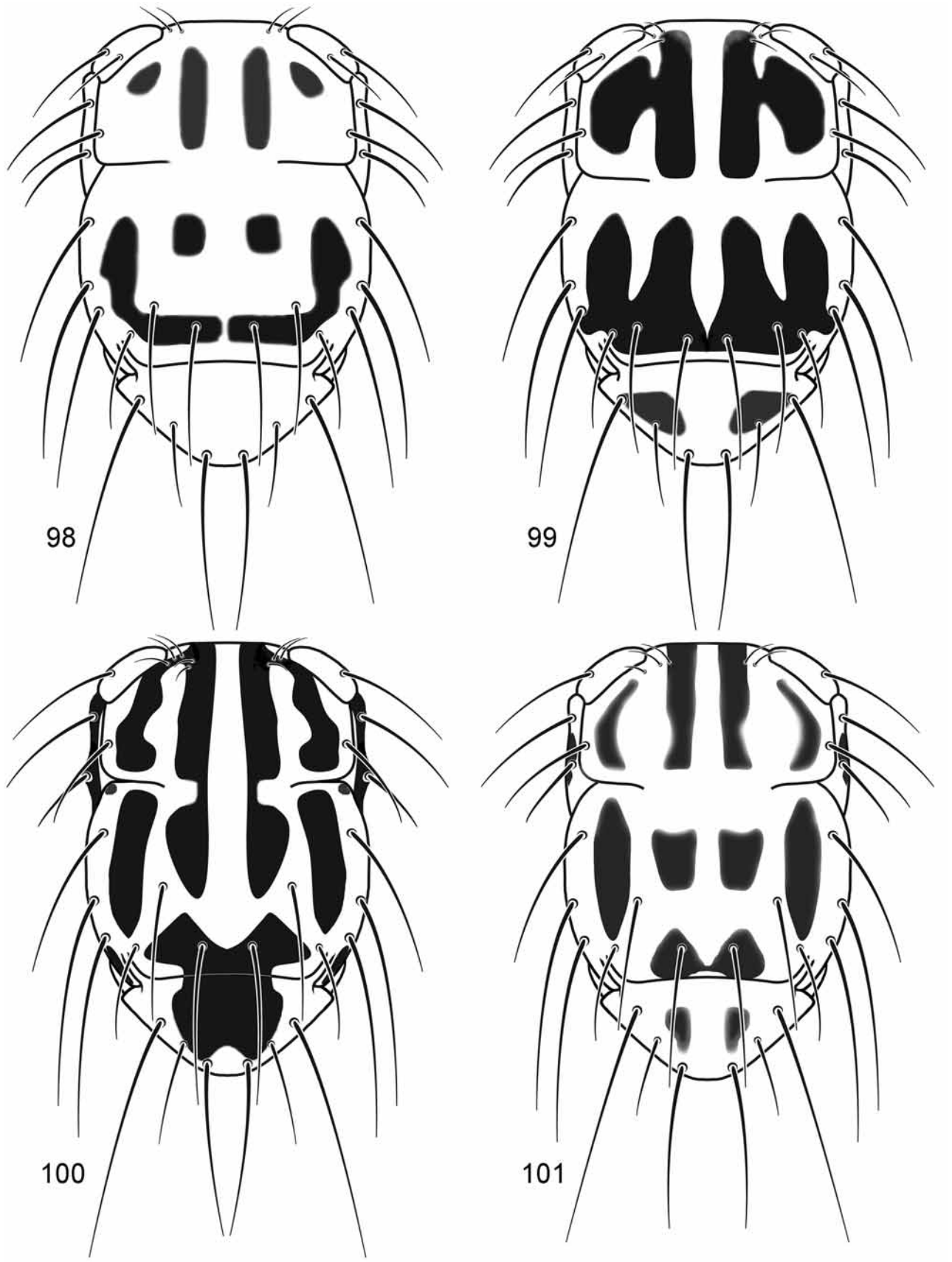
FIGURES 84–89. Head, posterior: 84, *B. femoralis* (Mexico: Lagunas de Zempoala, USNMENT00213772); 85, *B. variabilis* (Mexico: El Triunfo, USNMENT00213890); 86, *B. hirsuta* (Brazil: Rio de Janeiro, USNMENT00213794); 87, *B. chaconi* (Costa Rica: San Gerardo, INBio002539948); 88, *B.* sp. nr. *thetis* (Bolivia: Arroyo Tuhiri, USNMENT00056566); 89, *B. quadristriata* (Mexico: Los Tuxtlas, USNMENT00214950).



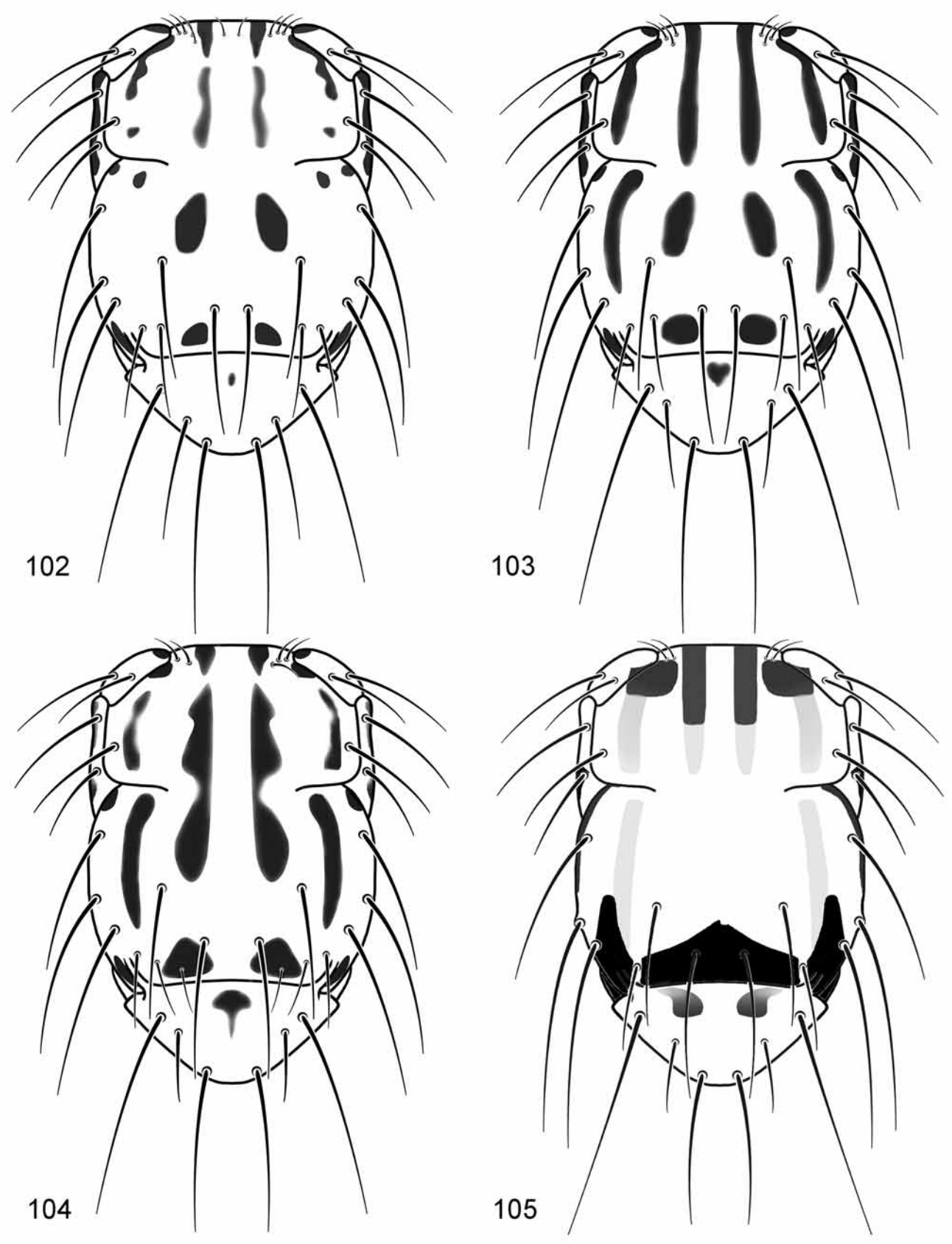
FIGURES 90–93. Thorax, dorsal: 90–91, *B. furcifer* (Venezuela: Capirito, USNMENT00213927; Peru: Avispas, USNMENT00053665); 92, *B. hirsuta* (Brazil: Rio de Janeiro, USNMENT00054199); 93, *B. septemdigitata* (Peru: Erika, USNMENT00054208).



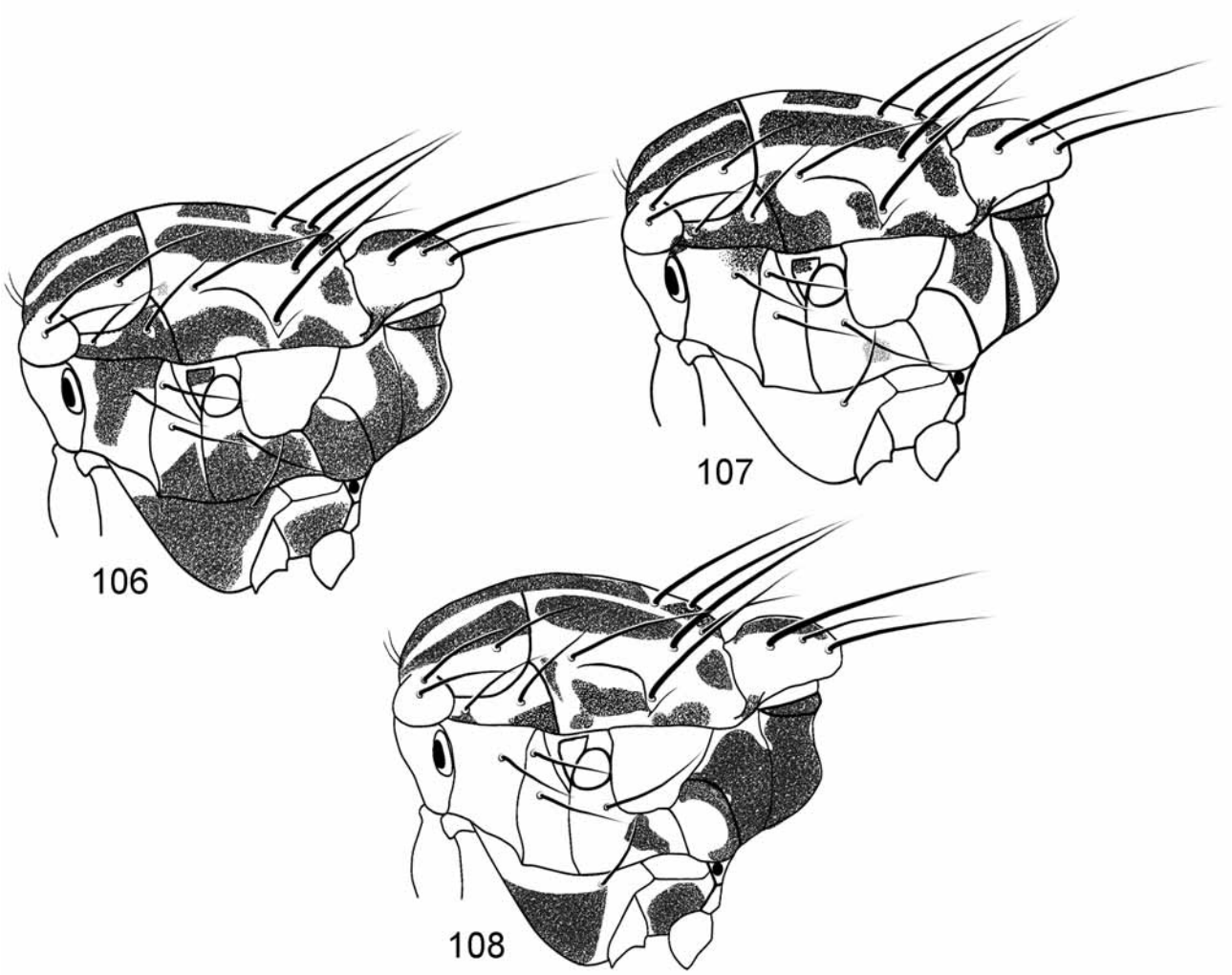
FIGURES 94–97. Thorax, dorsal: 94, *B. thetis* (holotype); 95, *B. bivittata* (Costa Rica: S Upala, USNMENT00054202); 96–97, *B. brevivittata* (Costa Rica: Rincon de Osa, USNMENT00054203; Costa Rica: Golfo Dulce, USNMENT00048518).



FIGURES 98–101. Thorax, dorsal: 98–99, *B. quadristriata* (Mexico: Los Tuxtlas, USNMENT00054200, USNMENT00054201); 100–101, *B. femoralis* (Mexico: El Triunfo, USNMENT00054206; San Cristobal, USNMENT00054205).



FIGURES 102–105. Thorax, dorsal: 102–104, *B. marshalli* (holotype; Argentina: Camino la Cornisa, USNMENT00054210, USNMENT00054211); 105, *B. tau* (holotype).



FIGURES 106–108. Thorax, lateral: 106, *B. femoralis* (Mexico: El Triunfo, USNMENT00213770); 107, *B. apaapa* (Bolivia: Apa Apa, USNMENT00055944); 108, *B. chaconi* (Costa Rica: San Gerardo, USNMENT00048386).

Type data. Holotype ♀ (MZUSP USNMENT00213907), BRAZIL: Santa Catarina: Nova Teutonia, Oct 1965, F. Plaumann. Paratypes: BRAZIL: Santa Catarina: Nova Teutonia, 27°11'S 52°23'W, 300–500 m, 30 Dec 1960, F. Plaumann, 1♂ (USNM USNMENT00213910); same, May 1963, 1♂ (CNC USNMENT00213909); same, Dec 1964, 1♀ (CNC USNMENT00213908); same, May 1977, 1♂ (FMNH USNMENT00213834); Nova Teutonia, Oct 1965, F. Plaumann, 1♂ (MZUSP USNMENT00213906); same, Jun 1967, 1♂ (MZUSP USNMENT00213905). São Paulo: Interlagos, Capital, 3 Dec 1980, M. Carrera, 1♀ (USNM USNMENT00213839).

Etymology. The name of this species is a Latin adjective referring to the pair of digitate lateral lobes on the aculeus.

***Blepharoneura bipunctata* Norrbom & Condon, new species**
Figs. 12, 131

Diagnosis. This species resembles *B. amplihyalina*, *apaapa*, *hyalinella*, *multipunctata* and *nigriapex* in having a dark brown spot posterodorsally on the anepisternum, a single medial brown spot on the scutellum, and 3 hyaline marginal spots in cell m. It differs from all of them except *B. multipunctata* in having 2 narrow

marginal hyaline marks basally in cell r_1 rather than a single broad one, and from *B. multipunctata* in having a small anepimeral brown spot and the aculeus tip with a convex medial apical lobe.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta or reaching it. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Mostly yellow. Postpronotal lobe with small brown spot at junction with anepisternum and sometimes with small diffuse brown spot on posterolateral margin. Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta interrupted at transverse suture, postsutural part reduced to well separated anterior and posterior spots, latter separated from mark on posterior margin; posterior margin with 2 broad quadrate dark brown marks well separated. Notopleuron with lateral margin dark brown. Small brown spot anterior to postsutural supra-alar seta, large dark brown spot lateral to postsutural seta, small dark brown spot anterior to postalar seta, and large dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single, small to moderately large, dark brown medial spot. Subscutellum and mediotergite with pair of dark brown vittae. Anepisternum with small dark brown spot dorsal to anterior seta. Anepimeron with small medial brown spot (faint on 1 side on 1 specimen). Katatergite pale brown dorsally and ventrally. Anatergite with large dark brown area medially and ventrally. Basalare with brown spot or entirely brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid and hind femora with red brown spot on margins of anteroventral and posteroventral apical ridges, extending more faintly slightly more basally very narrowly along ventral margins. Hind tibia dark brown narrowly bordering and on anteroventral and posteroventral basal ridges.

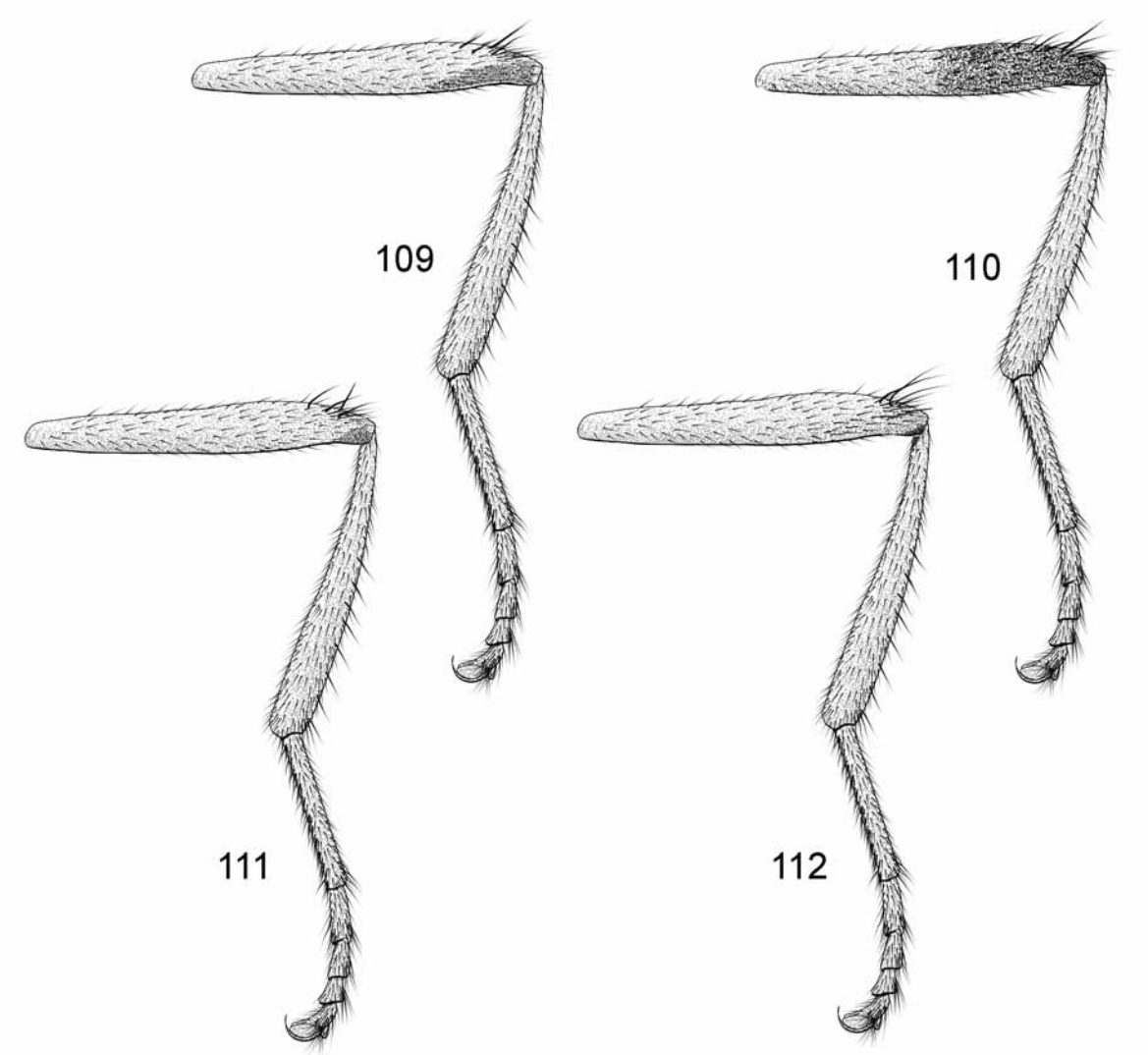
Wing (Fig. 12): Length 7.55–7.72 mm, width 3.20–3.27 mm, ratio 2.36. Crossvein r-m at 0.55–0.60 distance from bm-cu to dm-cu. Cell c with 2 inverted trapezoidal hyaline spots, both reaching costa and subcosta but fading to pale brown posteriorly; medial brown area almost as dark as area of cell r_1 posterior to pterostigma, broader than basal hyaline spot but approximately as broad as distal spot. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 3 and 2–3 pale brown to hyaline spots, respectively. Radial cells medially with 2 narrow basal marginal hyaline marks in cell r_1, both reaching R_{2+3}, sometimes with tiny posterior hyaline spot between them, proximal mark [#5] ovoid; cell r_{2+3} with 1 very broad hyaline mark posterior to r_1 marks (1 wing of 1 specimen) or usually with 1 small hyaline spot [#8] aligned with or slightly distal to basal mark in r_1 and 1 broad spot [#9] aligned with second mark in r_1; cell r_{4+5} with small hyaline spot [#14] in anterior half or medially and aligned with basal r_1 mark, with small hyaline spot [#15] aligned with or slightly proximal or distal to dm-cu, and also with additional tiny hyaline to pale brown spots, 1–3 near anterior margin and 0–4 on or near posterior margin. Distally cell r_1 with 1 [#6] or usually 2 small marginal hyaline spots, on 1 wing of 1 specimen also with 2 minute posterior spots. Cell r_{2+3} with 2 marginal hyaline marks [#10, 11], proximal mark extending to vein R_{4+5}. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3} or with distal mark; sometimes with small posterior hyaline spot aligned with medial spot in cell m; and with 1–2 small ovoid marginal or submarginal hyaline spots [#18, #18A], more anterior spot sometimes absent or connected away from margin with posterior spot forming somewhat C-shaped mark. Cell m with small subbasal hyaline spot [#49] near midlength of dm-cu and tiny spot near anterobasal corner; with 3 ovoid marginal hyaline spots [#27, #28, #29], medial spot [fusion of at least #28, #26, #26A] largest, irregular, extending to or almost to vein M. Cell br with subbasal pale brown spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu with or without small hyaline spot in lobe. Posteromedial part of wing with very large hyaline area; cell br subapically with hyaline spot [#13] and small to minute, much more proximal, pale brown spot; cell dm with 1 small anterior ovoid or narrow elongate medial hyaline spot very close to base and with large ovoid medial posterior hyaline mark [fusion of #22?, #23, #24] (ca. 0.25 times as long as cell along vein Cu_1) much shorter than hyaline mark in cell cu_1 and aligned with its distal part; cell cu_1 with very large hyaline area covering medial half or more [broad fusion of at least #31?, #32, #33, #34, #35?, #36, #36A], very broad on

posterior wing margin, lacking anterior brown spots and including 1 submarginal pale brown spot subbasally; subapical marginal hyaline spot [#37] relatively small, not reaching vein Cu_1. Cell dm with subapical hyaline spot [#25] moderate sized, and with smaller more distal anterior spot and posterior spot [#53] aligned or nearly aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow, all tergites with 4 rows of evenly spaced dark brown spots, on tergites 3–5 more lateral spot large and connected to or narrowly separated from lateral and posterior markings; tergites 3–5 also with anterolateral spot touching or almost touching lateral margin; all tergites also with pair of spots or band on posterior margin and posterolateral corner, separated medially, on tergites 3–5 extending anteriorly on lateral margin and connected to anterolateral spot, but on tergites 3 and 4 margin with small yellow spot.

Female terminalia: Oviscape entirely dark brown; length 1.09 mm. Aculeus (Fig. 131) 0.87 mm long, 1.98 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.34 times as long as wide), with small, convex medial lobe and 3 pairs of step-like lobes separated by deep gaps; sublateral lobe larger than submedial lobe; lateral gap 0.90 times as long as wide.

Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

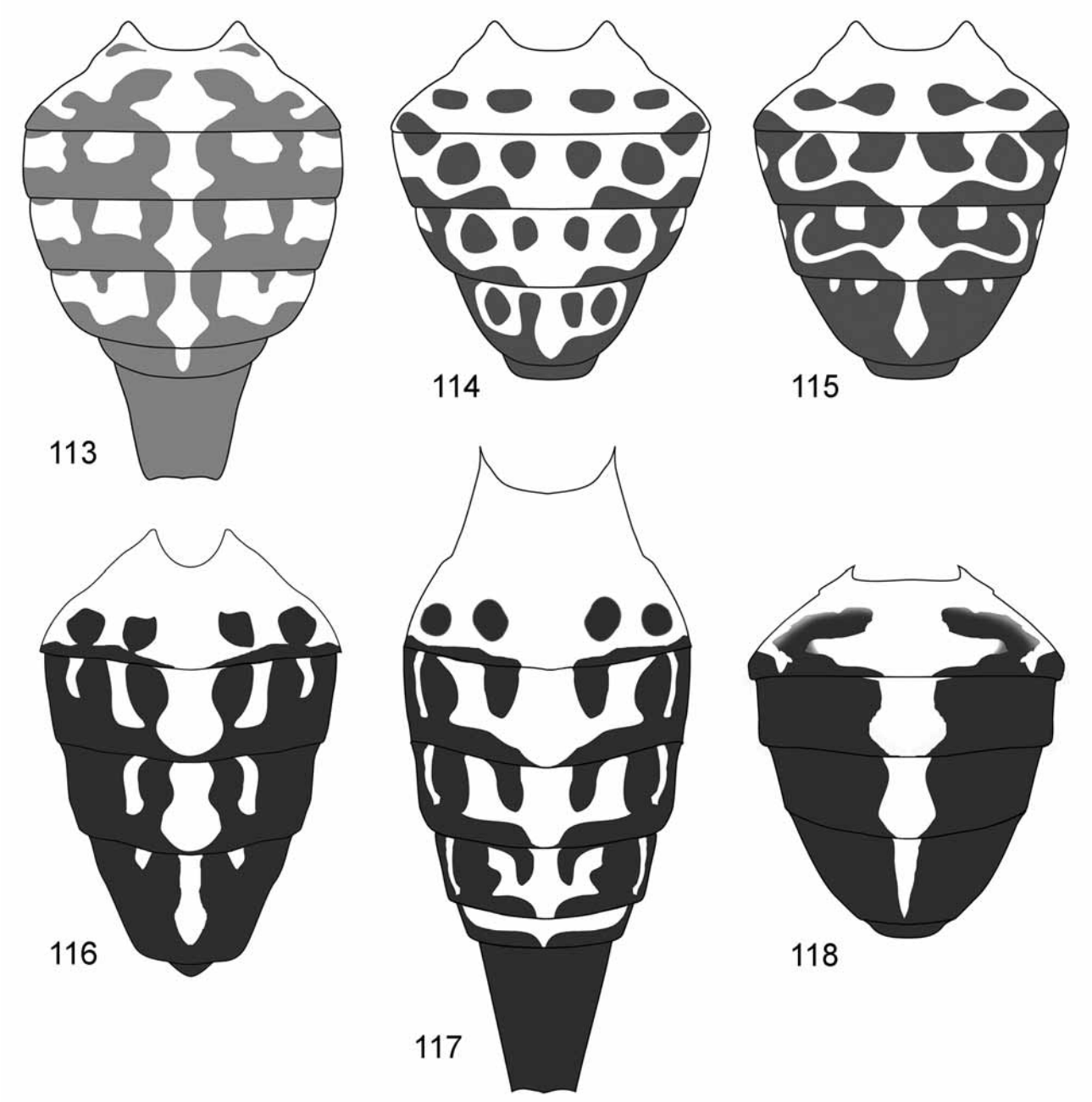


FIGURES 109–112. Left hind leg, anterior: 109, *B. variabilis* (Mexico: El Triunfo, USNMENT00213891); 110, *B. nigrifemur* (Bolivia: Apa Apa, USNMENT00055922); 111, *B. bidigitata* (Brazil: Nova Teutonia, USNMENT00213834); 112, *B. apaapa* (Bolivia: Apa Apa, USNMENT00055934).

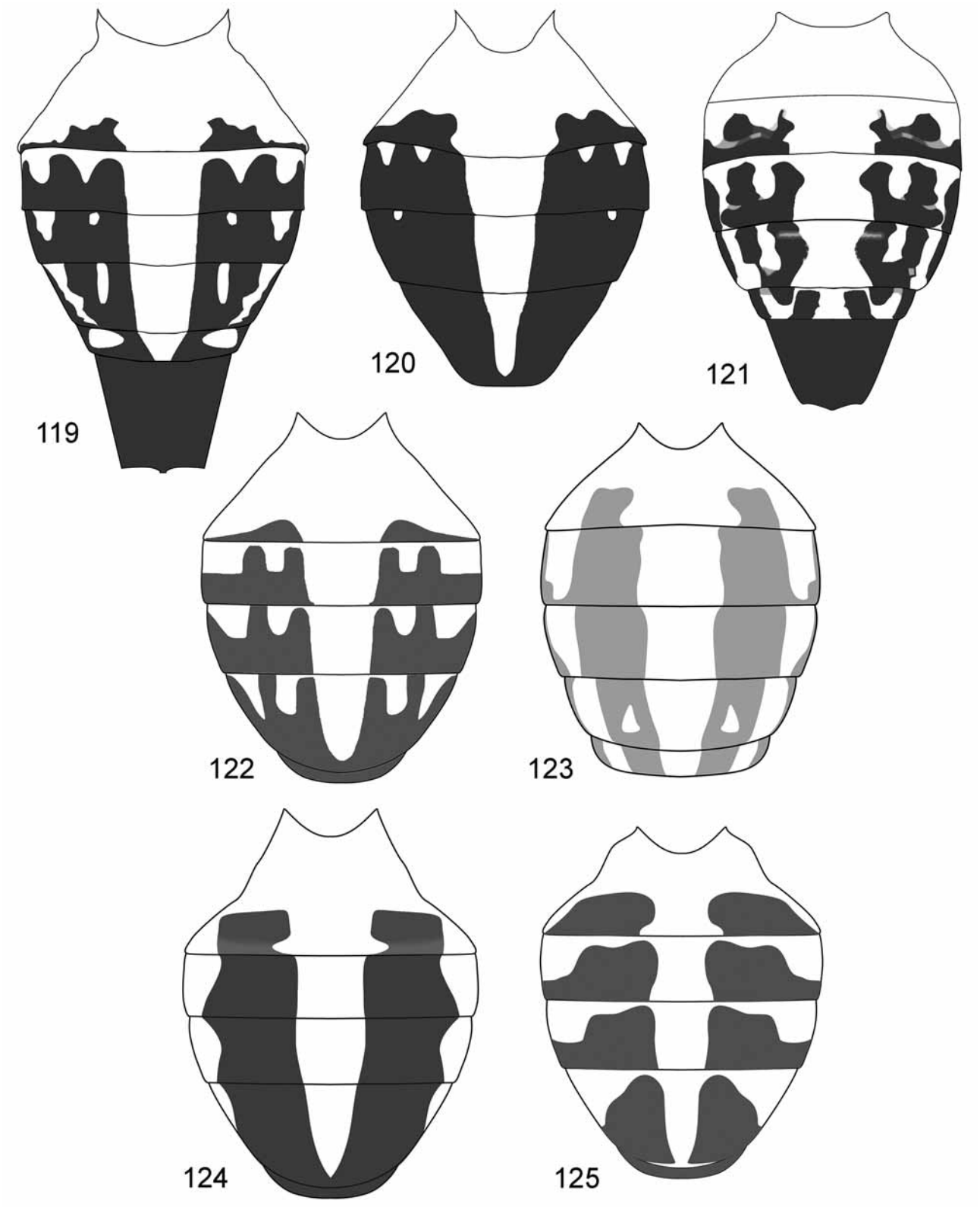
Distribution. Ecuador. The type specimens were collected at 2000 m elevation.

Type data. Holotype ♀ (CMP USNMENT00213904), ECUADOR: Cotopaxi: San Francisco de las Pampas, Otonga, 2000 m, 20 Oct 1996, G. Onore. Paratype: Same data as holotype, 1♀ (USNM USNMENT00213903).

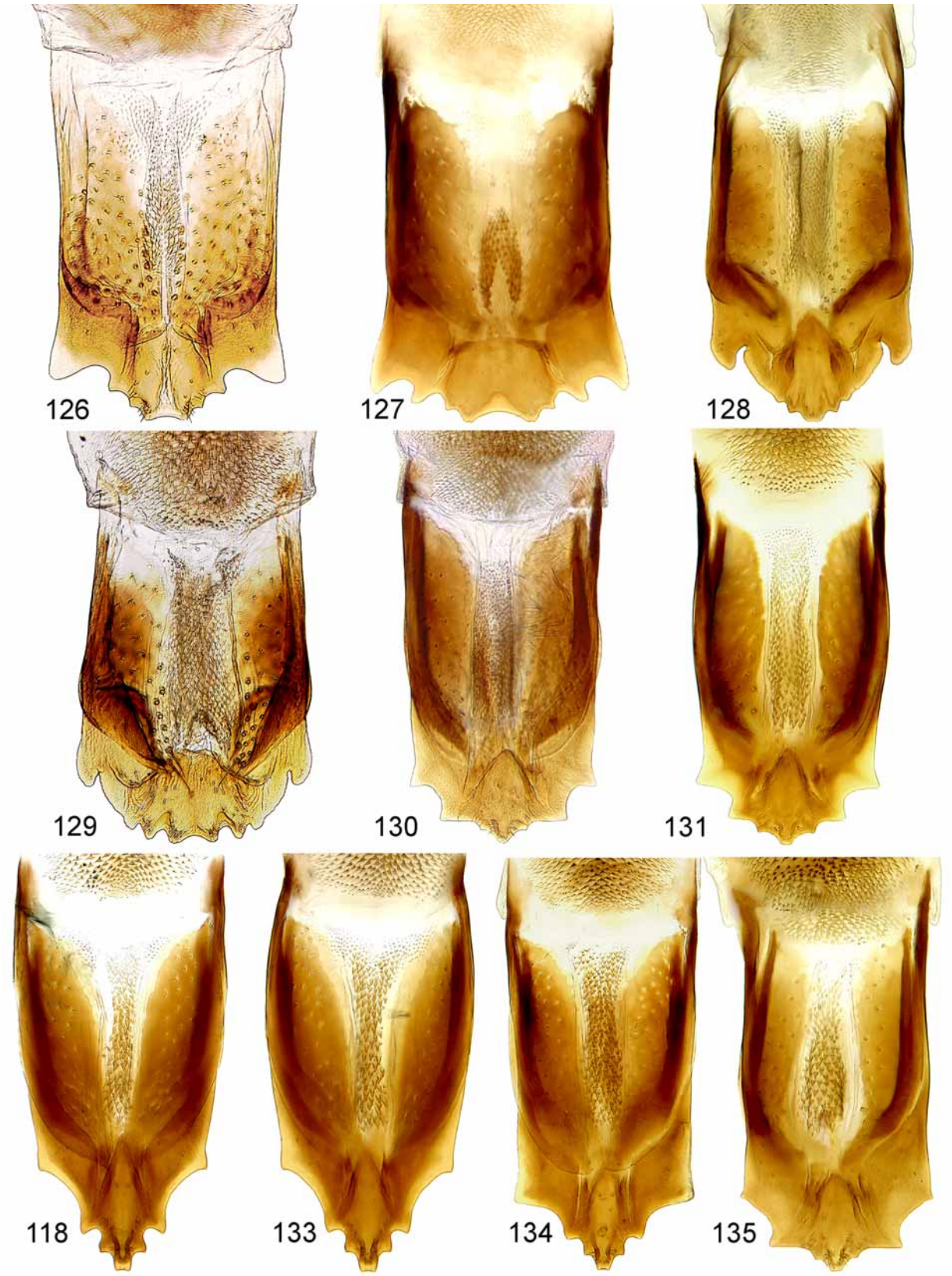
Etymology. The name of this species is an adjective referring to the two basal marginal hyaline marks in cell r_1.



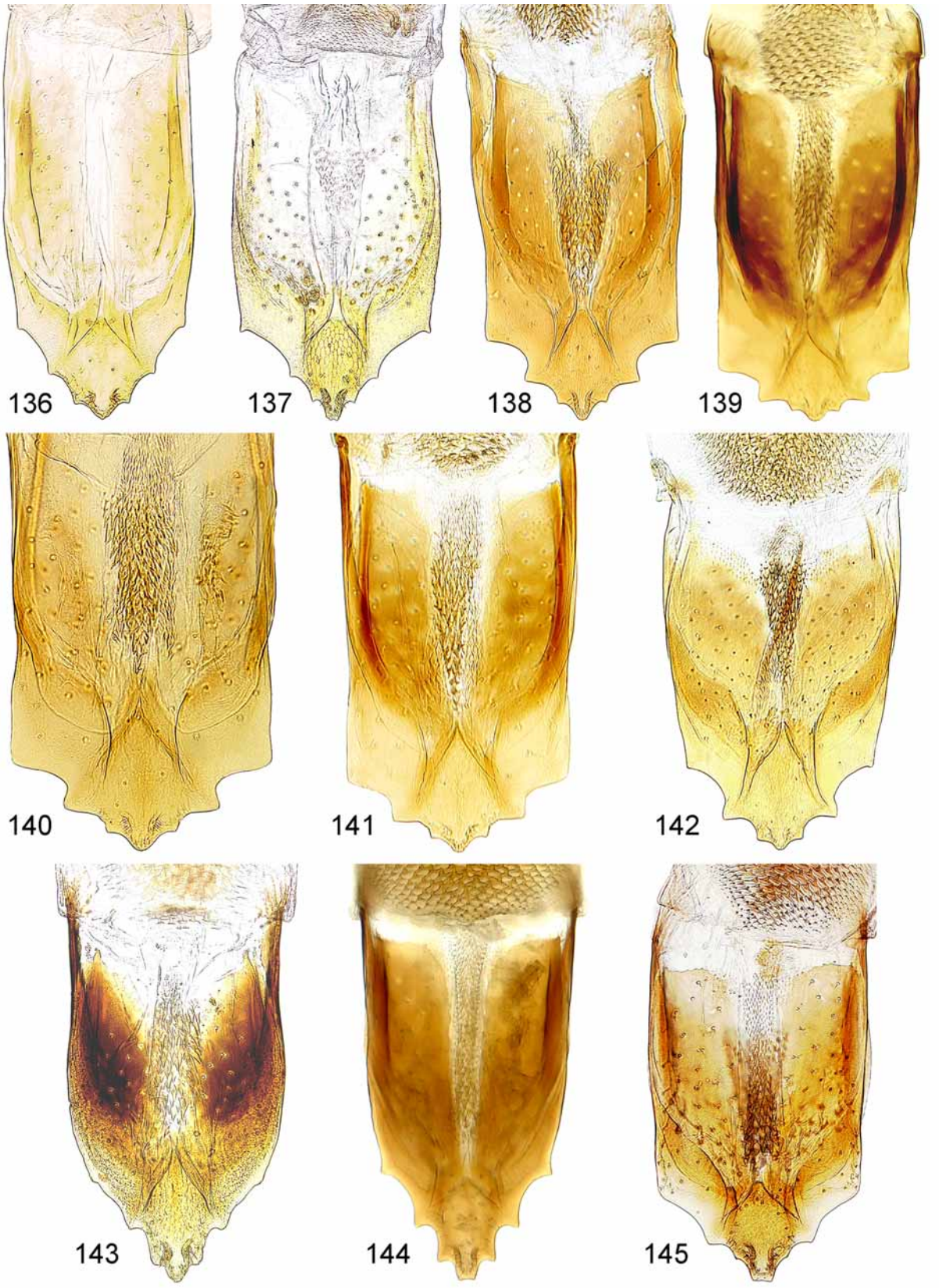
FIGURES 113–118. Abdomen, dorsal: 113, *B. femoralis* (USNMENT00054204); 114–115, *B. marshalli* (Argentina: Camino la Cornisa, USNMENT00054210–11); 116–117, *B. chaconi* (InBio002151664; INBio002539948); 118, *B. tau* (holotype).



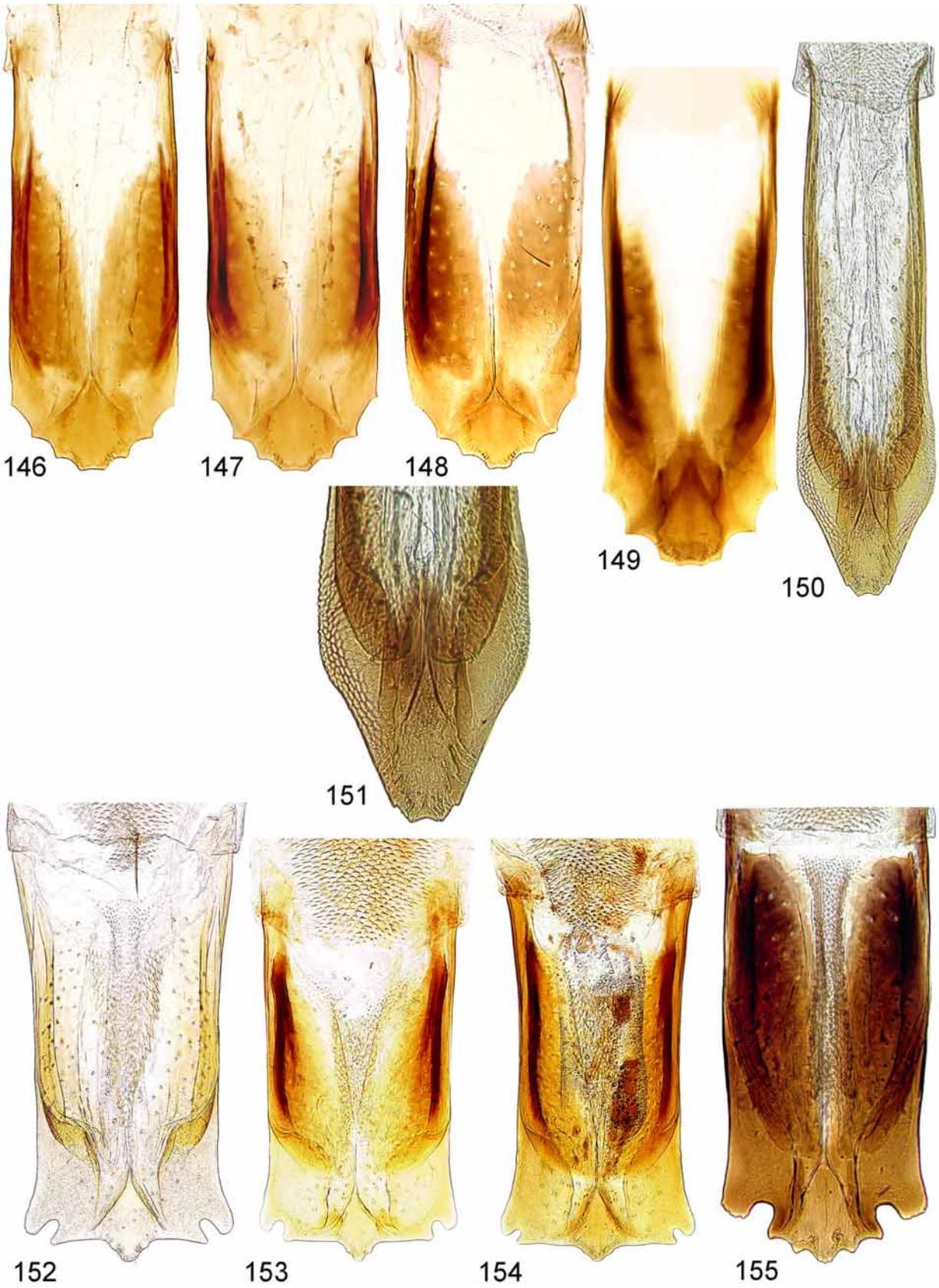
FIGURES 119–125. Abdomen, dorsal: 119–120, *B. septemdigitata* (Peru: Pakitza, USNMENT00213939–40); 121, *B. cornelli* (holotype); 122, *B. furcifer* (USNMENT00053665); 123, *B. hirsuta* (Brazil: Manaus, USNMENT00054198); 124, *B. brevivittata* (Costa Rica: Rincon de Osa, USNMENT00054203); 125, *B. quadristriata* (Mexico: Los Tuxtlas, USNMENT00054201).



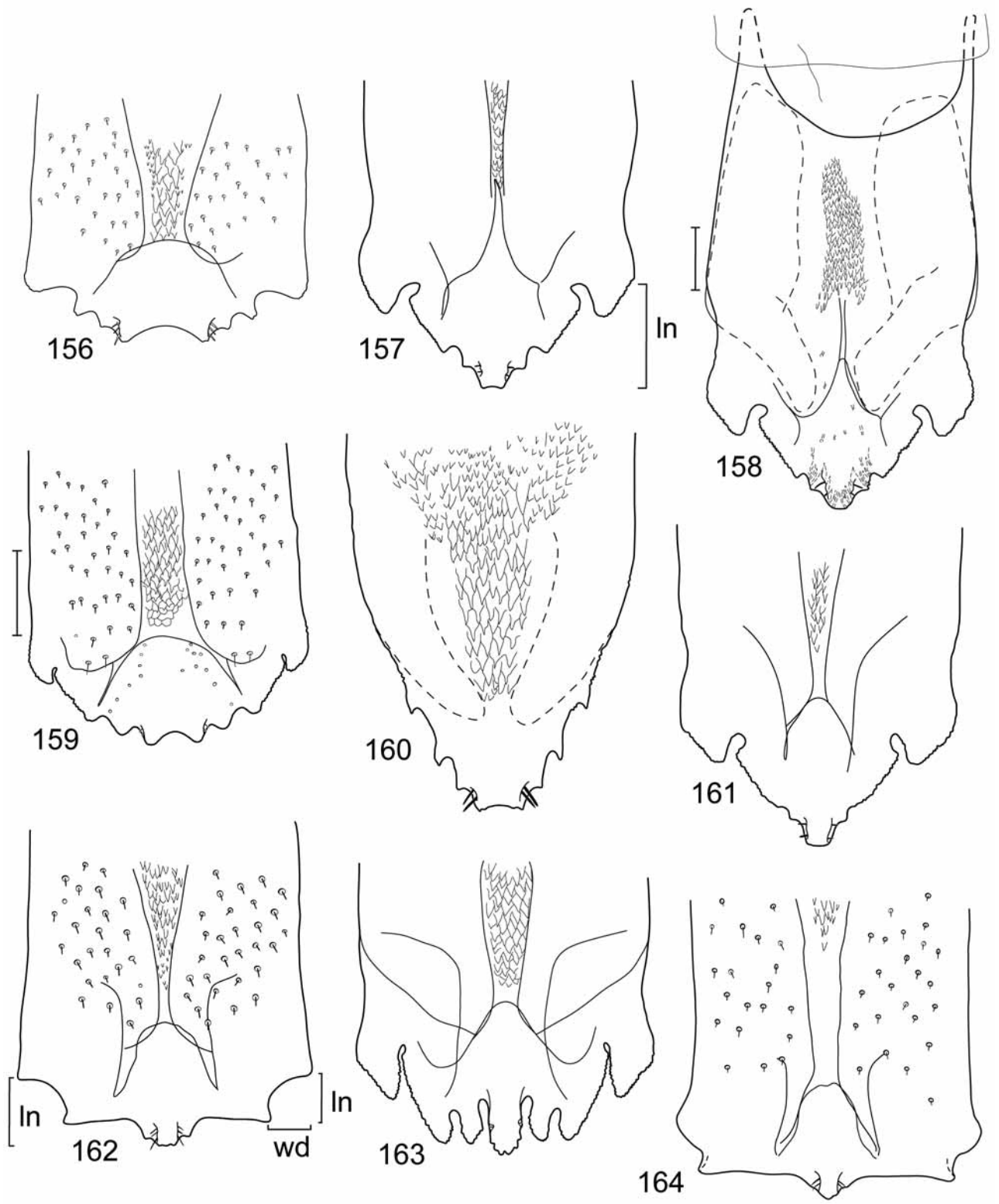
FIGURES 126–135. Aculeus: 126, *B. bivittata* (holotype, USNMENT00213023); 127, *B. brevivittata* (Costa Rica: Golfo Dulce, USNMENT00048518); 128, *B. cornelli* (holotype, INBio001228576); 129, *B. lutea* (Costa Rica: Pitilla, INBio000424938); 130, *B. macwilliamsae* (Costa Rica: La Cangreja, USNMENT00048509); 131, *B. bipunctata* (Ecuador: Otonga USNMENT00213903); 132–133, *B. apaapa* (Bolivia: Apa Apa, USNMENT00055947, USNMENT00213943); 134, *B. hyalinella* (Bolivia: Apa Apa, USNMENT00055931); 135, *B. nigriapex* (Bolivia: Apa Apa, USNMENT00055930).



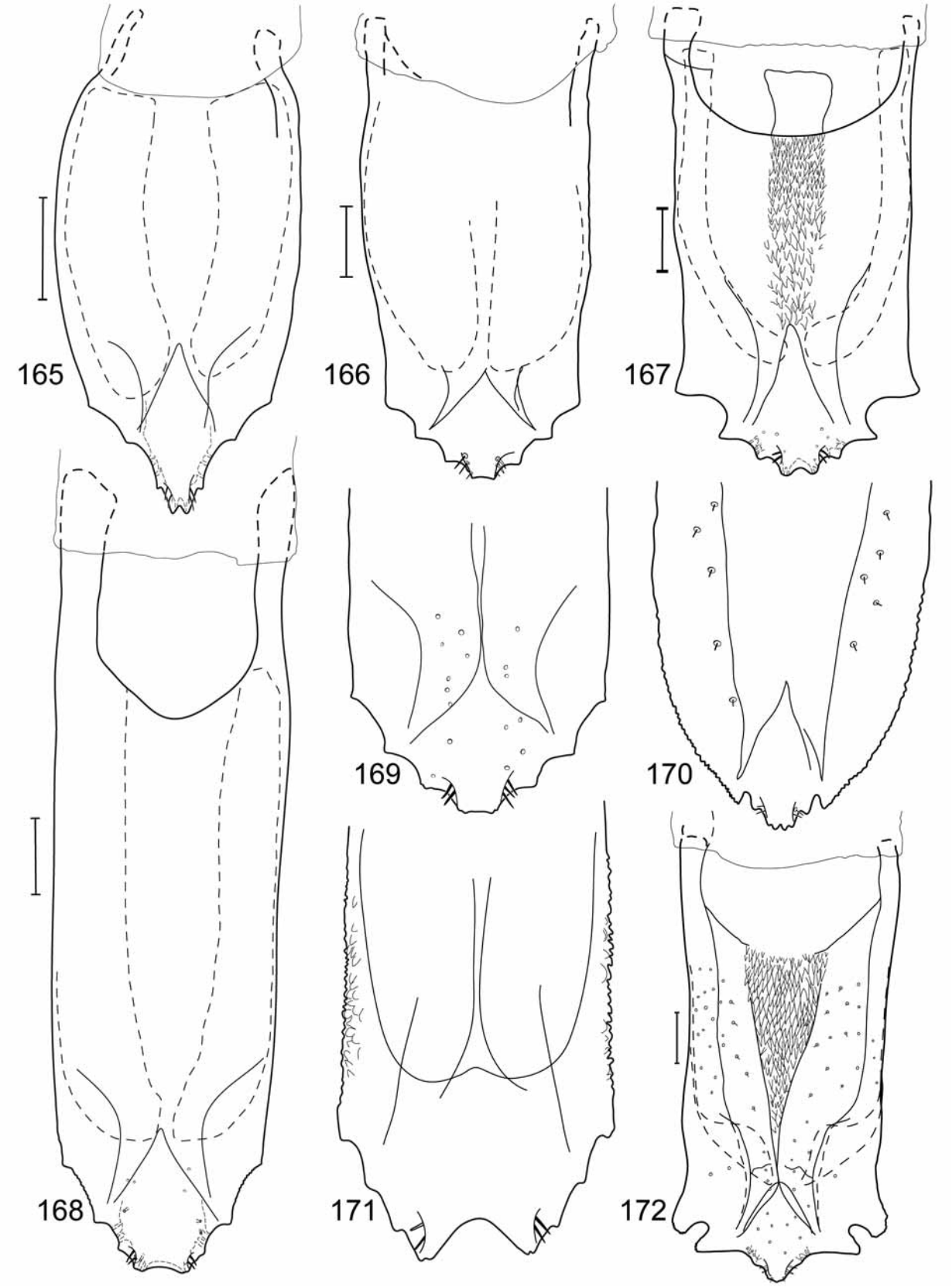
FIGURES 136–145. Aculeus: 136, *B. aspiculosa* (Mexico: El Triunfo, USNMENT00213912); 137, *B. cyclantherae* (Mexico: Rt. 95, USNMENT00052304); 138–142, *B. femoralis* (Guatemala: Coban, USNMENT00213771; Brazil: Nova Teutonia, USNMENT00213760, USNMENT00052320, USNMENT00213761; Peru: Chanchamayo, USNMENT00213960); 143, *B. nigrifemur* (Bolivia: Apa Apa, USNMENT00055925); 144, *B. sinepuncta* (Costa Rica: Zurquí, USNMENT00050130); 145, *B. zumbadoi* (Costa Rica: San Gerardo, INBio002578264).



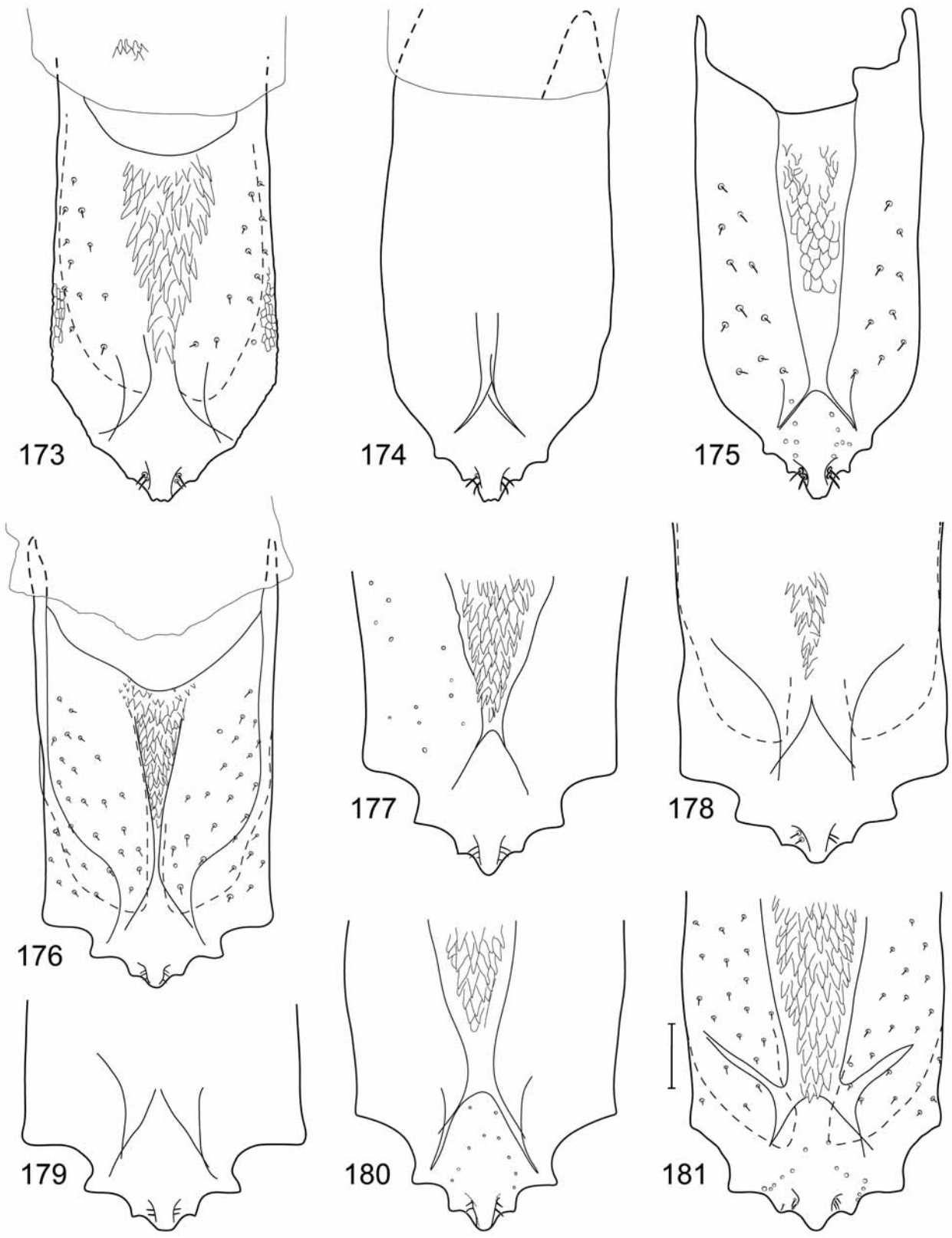
FIGURES 146–155. Aculeus: 146–148, *B. mexicana* (Mexico: S Chapingo, USNMENT00213805–06; holotype, USNMENT00213858); 149, *B. chaconi* (Costa Rica: San Gerardo, USNMENT00048388); 150–151, *B. quetzali* (holotype); 152, *B. bidigitata* (Brazil: Interlagos, USNMENT00213839); 153–154, *B. hirsuta* (Guyana: Moraballi Creek, USNMENT00213793; Brazil: Rio de Janeiro, USNMENT00054199); 155, *B. wasbaueri* (holotype).



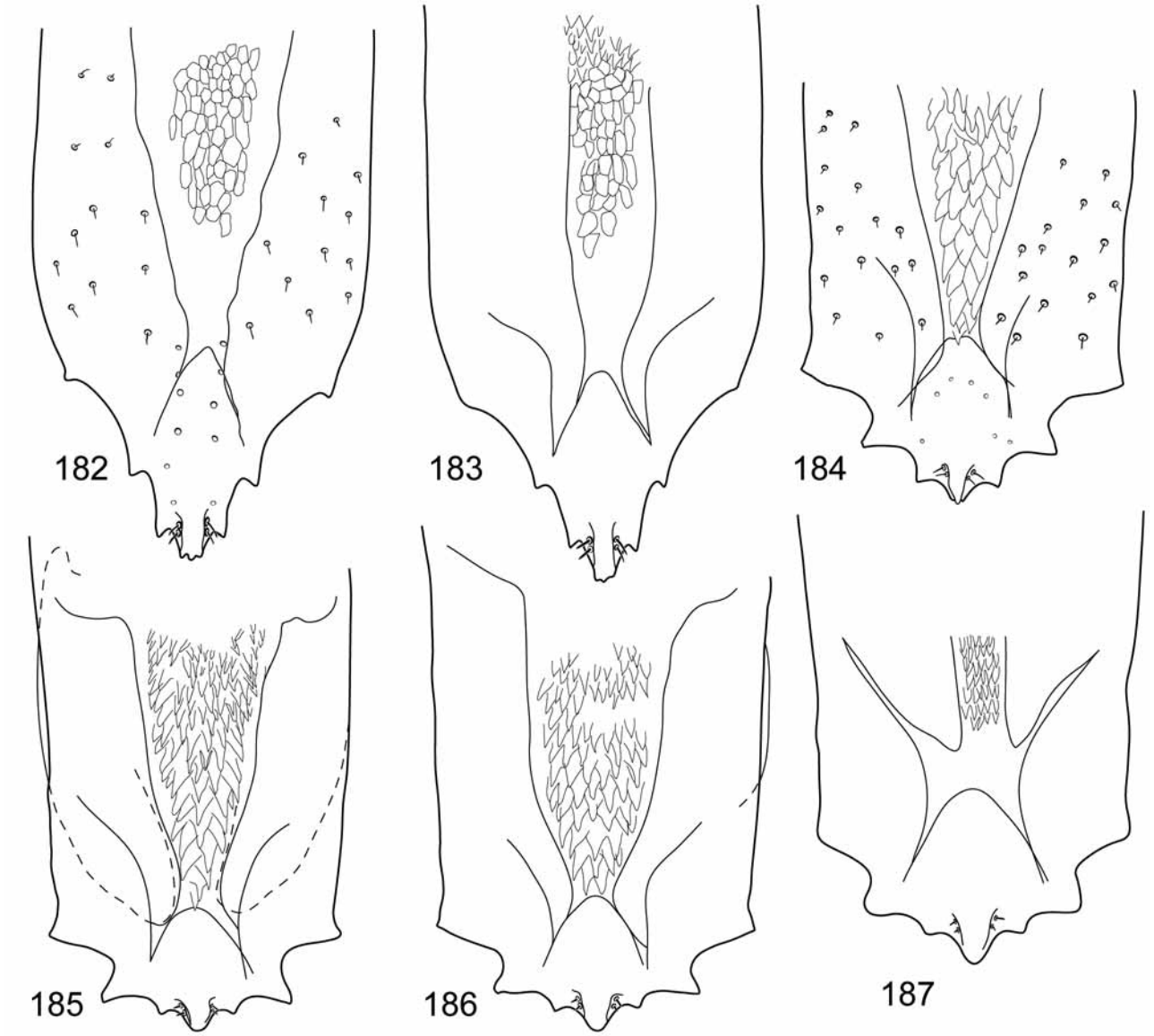
FIGURES 156–164. Aculeus: 156, *B. fernandezi* (Brazil: Santarem, USNMENT00213888); 157–158, *B. furcifer* (Ecuador: Limoncocha, USNMENT00213928; lectotype); 159, *B. lutea* (Costa Rica: Golfito, USNMENT00213824); 160, *B. quadristriata* (Mexico: Los Tuxtlas, USNMENT00054200); 161, *B. rupta* (Mexico: Teapa, USNMENT00213796); 162, *B. ruptafascia* (holotype); 163, *B. septemdigitata* (Peru: Pakitza, USNMENT00213937); 164, *B. unifasciata* (holotype). ln = length, wd = width (of tip and gap).



FIGURES 165–172. Aculeus: 165, *B. amplihyalina* (holotype); 166, *B. marshalli* (holotype); 167, *B. multipunctata* (holotype); 168, *B. mikenoltei* (holotype); 169, *B. mexicana* (Mexico: Mexico City, USNMENT00213809); 170, *B. regina* (Mexico: Lagunas de Zempoala, USNMENT00213846); 171, *B. variabilis* (Mexico: El Triunfo, USNMENT00213899); 172, *B. bidigitata* (Brazil: Nova Teutonia, USNMENT00213907).



FIGURES 173–181. Aculeus: 173–174, *B. biseriata* (holotype; Mexico: Huipulco USNMENT00213950; medial membrane not shown in 158); 175, *B.* sp. nr. *biseriata* (Mexico: E El Palmito, USNMENT00213947); 176–180, *B. femoralis* (lectotype; Guatemala: Coban, USNMENT00213771; Brazil: Nova Teutonia, USNM00213761; Mexico: Rio Molinos, USNMENT00213778; Mexico: Mexico City, USNMENT00213773); 181, *B. punctistigma* (Mexico: Los Tuxtlas, USNMENT00213914).



FIGURES 182–187. Aculeus: 182–183, *B. osmundsonae* (Mexico: Valle de Bravo, USNMENT00213962; Mexico: El Yukon, USNMENT00213953); 184–187, *B. splendida* (Mexico: San Blas, USNMENT00213873; Salto de Eyipantla, USNMENT00213877; Guatemala: Pochuta, USNMENT00213874; Venezuela: Rancho Grande).

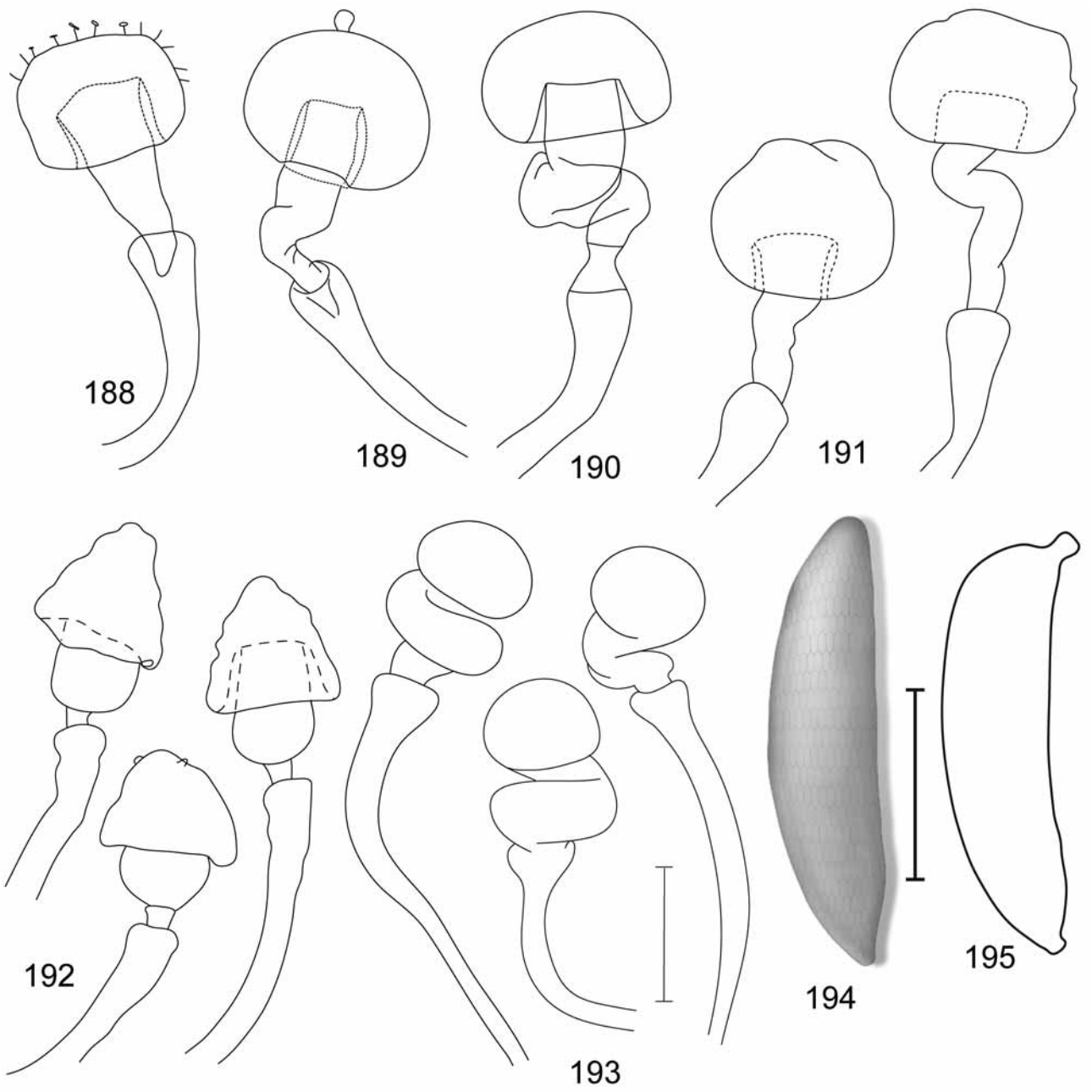
***Blepharoneura biseriata* Wulp**
Figs. 13, 173–174

Blepharoneura biseriata Wulp 1899: 411 [in key], 413 [description]; Hendel 1914: 21 [in key, in catalog]; Aczél 1950: 195 [in catalog]; Foote 1965: 241 [type data]; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 105 [in catalog].
Blepharoneura btseriata: Aczél 1950: 195 [misspelling].

Diagnosis. This species belongs to the *femoralis* complex (see diagnosis of *B. femoralis*), species of which are difficult to distinguish except by aculeus shape. The aculeus of *B. biseriata* is less elongate than that of *B. nigrifemur*, and it differs from those of the other species of the complex in having the lateral lobe very weak or absent.

Description. Head: Dark brown area on ocellar tubercle extended to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of brown submedial vittae on ventral half. Occipital suture

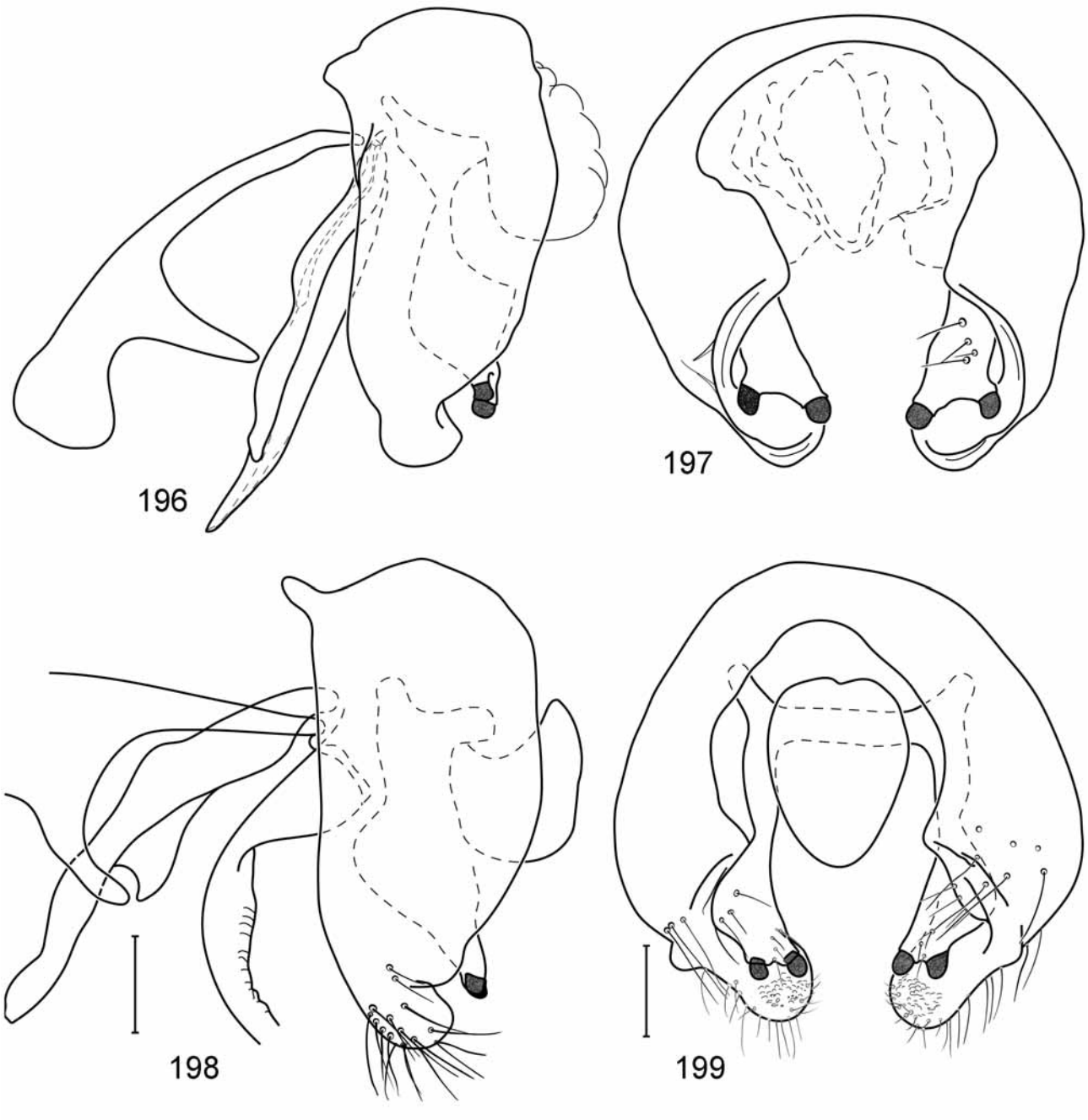
narrowly dark brown, on lateral side bordered by slightly paler triangular area, extended dorsolaterally beyond postocular setae almost to eye margin except for small circular yellow area around lateral vertical seta.



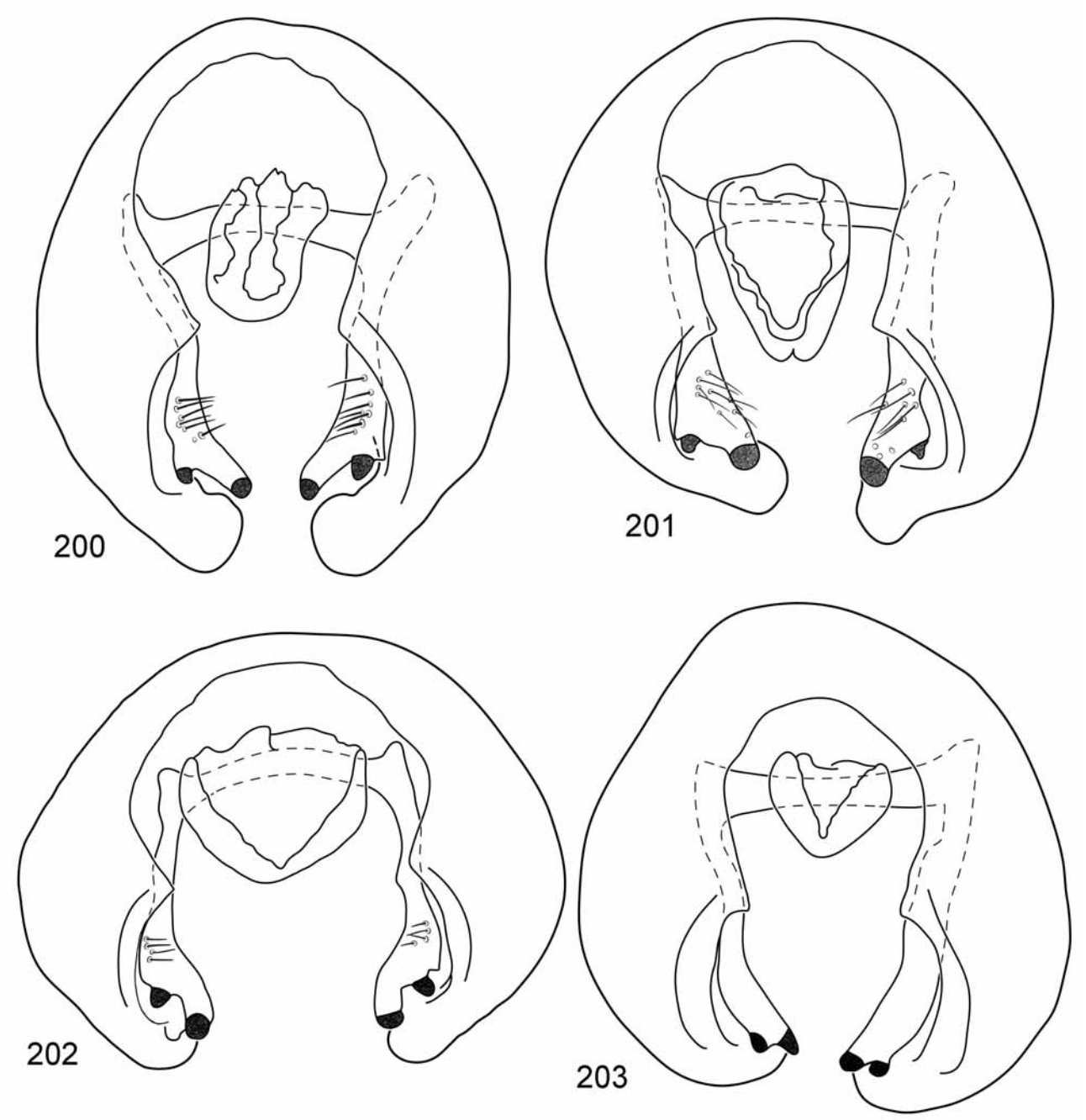
FIGURES 188–195. Spermathecae: 188–190, *B. femoralis* (Mexico: Lagunas de Zempoala, USNMENT00213772; Oaxaca, USNMENT00213778; Brazil: Nova Teutonia, USNMENT00052306); 191, *B. regina* (2) (Mexico: Lagunas de Zempoala, USNMENT00213846); 192, *B. quadristriata* (3) (Mexico: Los Tuxtlas, USNMENT00213949); 193, *B. furcifer* (3) (lectotype). Egg: 194, *B. femoralis* (Mexico: Mexico City, USNMENT00213773); 195, *B. lutea* (Costa Rica: Golfito, USNMENT00213824).

Thorax: Scutum nonmicrotrichose except posterior to acrostichal seta and laterally, with 2 pairs of dark brown vittae or rows of spots; submedial vitta interrupted or narrowed slightly posterior to transverse suture and not connected to mark on posterior margin; sublateral vitta broadly interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially. Notopleuron with dark brown vitta on lateral margin. Small brown spot anterior to postsutural supra-alar seta present, narrowly connected along transverse suture to brown vitta anterior to postalar seta. Large brown spot

lateral to dorsolateral corner of scutellum present. Scutellum with single inverted U-shaped medial brown mark extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, extended to lateral margin on ventral half of mediotergite. Pleuron mostly dark brown, yellow only on propleuron, most of anepisternum (except large dorsomedial dark brown spot extending ventrally to level of anterior seta, and narrowly in posteroventral corner), extreme posterior corner of katepisternum, all of katepimeron, greater ampulla, narrow dorsal margin and sometimes narrow posterior and ventral margins of anepimeron, and narrow dorsal margins of katatergite and anatergite expanding to larger spot posterodorsally on katatergite and anteriorly on anatergite. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.



FIGURES 196–199. Epandrium and surstyli, lateral and posterior: 196–197, *B. femoralis* (Brazil: Nova Teutonia); 198–199, *B. thetis* (holotype).



FIGURES 200–203. Epandrium and surstyli, posterior: 200, *B. amplihyalina* (Argentina: Horco Molle, USNM00213855); 201, *B. mexicana* (Mexico, USNM00213821); 202, *B. quadristriata* (Mexico, Los Tuxtlas, USNM00213850); 203, *B. rupta* (Belize, Stann Creek, USNM00213797).

Legs: Mostly yellow. Hind femur with entire apical 1/5 dark brown.

Wing (Fig. 13): Length 5.44–5.70 mm, width 2.67–2.70 mm, ratio 2.04–2.11. Crossvein r-m at 0.53–0.54 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area as dark as to slightly paler than area of cell r_1 posterior to pterostigma, narrower than both hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–2 and 1 pale brown or hyaline spots, respectively. Radial cells medially with 1 broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1, usually partially divided posteriorly by brown spot; cell r_{2+3} with 2 hyaline spots [#8, #9] aligned with r_1 mark, both extending across

cell, distal spot broader; cell r_{4+5} in anterior half with small hyaline spot [#14] aligned with middle of r_1 mark, approximately half as wide as cell, and with medial hyaline spot [#15] near anterior end of dm-cu small; sometimes with small to minute anterior hyaline spot [#48] near midlength not touching vein R_{4+5}. Distally cell r_1 with 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 marginal ovoid hyaline spots [#10A, #11] and subapical spot posterior to proximal spot [#10B]. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3}, or (1 wing of 1 specimen) with 2 spots aligned with apical marks in cell r_{2+3}; with 1 posterior ovoid hyaline spot aligned with distal mark in cell m; and with 2 ovoid marginal or submarginal hyaline spots [#18, #18A]. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 2 large marginal hyaline spots [#27, #29] and 1 large anteromedial spot [fused #26, #26A]. Cell br with subbasal hyaline spot [#12]. Cell bm without subbasal hyaline spot [#19], with large circular subapical hyaline spot [#20]. Cell bcu usually without hyaline spot in lobe (present on 1 wing of 1 specimen). Posteromedial part of wing with large hyaline areas; cell br with subapical hyaline spot [#13]; cell dm with broad and long hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, sometimes #50], sometimes narrowly or partially divided by pale brown into 2–3 spots, aligned with large hyaline mark in cell cu_1, anteriorly extending to or almost to level of r-m, but distal margin oblique or tapered, extending farther posteriorly than anteriorly; cell cu_1 medially with 5 barely separated spots, or with broad medial Y-shaped mark [fused #32, #33, #36] and more proximal anterior [#31] and posterior [fused #34, #39] spots, or with all of these connected to form large anteriorly trilobed and posteriorly bilobed mark isolating 2 small anterior and 1 small submarginal brown spot; subapical marginal hyaline spot [#37] reaching vein Cu_1. Cell dm with anteromedial subapical hyaline spot [#25] moderately large, isolated.

Abdomen: Syntergite 1+2 with pair of irregular posterolateral brown marks, separated medially, formed from fused submedial and sublateral spots and posterolateral bands. Tergites 3–5 with pair of irregular posterolateral brown marks, separated medially, formed from fused submedial and sublateral spots and posterolateral bands; also with isolated anterolateral spots.

Female terminalia: Oviscape entirely dark brown; length 0.90 mm. Aculeus (Fig. 173–174) 0.43 mm long, 2.00–2.08 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip somewhat blunt, slightly angular basolaterally, without distinct lateral lobe, short to slightly elongate triangular (lobed part 0.43–0.54 times as long as wide), with small, weakly trilobed medial lobe and 2 pairs of small, somewhat step-like lobes separated by shallow gaps, lobes and gaps slightly larger in Huipulco female; sublateral and submedial lobes similar in size. Spermathecae subspherical, with straight slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta on short lobe.

Distribution. Mexico (Distrito Federal, Guerrero). The holotype was collected at over 2100 m elevation.

Type data. Holotype ♀ (BMNH), MEXICO: Guerrero: Sierra de las Aguas Escondidas, 7000 ft. [2134 m], Jul, H. H. Smith [examined].

Other specimens examined. MEXICO: [Distrito Federal:] Huipulco, [19°17'N 99°09'W], 21 Aug 1922, E. G. Smyth, 2♂1♀ (USNM USNMENT00213948–50).

Remarks. A single headless female from Sinaloa, Mexico (El Palmito, 2.5 mi E of, 21 Aug 1964, E. I. Schlinger, UCR USNMENT00213947) may be *B. biseriata* or a very similar species. It has only minor differences with *B. biseriata* in wing pattern (Fig. 14) (cell c with medial brown area almost as broad as both hyaline spots; cell cell r_{2+3} basally without hyaline spot; distally cell r_{2+3} without hyaline spot posterior to proximal marginal spot [posterior part of #10 absent]; cell bm with circular subbasal hyaline spot [#19]) and is similar in other external characters, but the aculeus (Fig. 175) lacks scales on the medial membrane ventrally, and the dorsal scales are predominantly polygonal, becoming acute only proximally. Also, the base of the aculeus tip is rounded laterally, lacking the normal lateral lobe, whereas in *B. biseriata* there is a slight angle. Further specimens and data are needed to clarify the status of this female.

***Blepharoneura bivittata* Norrbom & Condon, new species**
Figs. 15–16, 95, 126

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: vertex with brown spot or band surrounding medial vertical seta; scutum with pair of submedial brown vittae, uninterrupted at transverse suture; anepisternum without brown markings; pterostigma without subapical hyaline spot; cell m with 2 hyaline marks extended into cell r_{4+5} and connected to form inverted V-shaped mark; abdominal tergites with pair of solid dark brown vittae without yellow spots and with even medial margins, not extending to lateral margins of tergites, which are yellow. The aculeus of *B. bivittata* resembles those of *B. brevivittata* and *fernandezi* in having a very broad, deep medial concavity, but the part of the tip exclusive of the lateral lobes is narrower and more elongate.

Description. Head: Dark brown area (orange brown in 1♂) on ocellar tubercle extended half distance to or beyond postocellar seta. Medial vertical seta in ovoid orange brown to dark brown spot mostly posteromesal to seta or (Upala ♂) in broad band extended to opposite seta and connected to area on ocellar tubercle. Occipital suture narrowly dark orange to dark orange brown. Sometimes (2♂) with diffuse pale brown area including and ventral to lateral vertical seta, in 1 specimen extending along eye margin.

Thorax (Fig. 95): Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, with pair of broad dark brown submedial vittae, in holotype extended to midway between levels of postsutural supra-alar seta and intra-alar seta, presutural part dark brown, faded to orange brown posterior to transverse suture, in males extended to posterior brown mark. Posterior margin yellow (holotype) or usually with bimodal or elongate triangular dark brown mark, in Turrialba male with sublateral vittae extending anteriorly from it. Scutellum entirely yellow (holotype) or usually with brown band or broad inverted triangular mark at level of basal seta and extended to it (weakly in 1♂), sometimes (1♂) almost divided medially. Subscutellum entirely yellow; mediotergite entirely yellow or (Turrialba ♂) brown except medial yellow vitta. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned with or slightly posterior to postalar seta.

Legs: Mostly to entirely yellow. Hind tibia mostly pale to moderate brown in males.

Wing (Figs. 15–16): Length 5.10–5.40 mm, width 2.57–2.82 mm, ratio 1.91–2.00. Crossvein r-m at 0.53–0.59 distance from bm-cu to dm-cu. Cell c sometimes (holotype, Turrialba ♂) with 2 rectangular hyaline spots, separated by narrower medial brown area; in Upala males with 1 goggles-shaped hyaline area, rounded basally and distally and narrower medially; medial brown area(s) distinctly paler than area of cell r_1 posterior to pterostigma. Pterostigma without subapical hyaline spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots except sometimes (Turrialba ♂) r_1 with tiny spot posterior to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot in r_{2+3} [#8] forming acute triangular or inverted trapezoidal mark, usually reaching R_{4+5} or (holotype) extending less than halfway across r_{2+3}; no aligned spot present in r_{4+5}, and medial hyaline spot [#15] near anterior end of dm-cu small and faint (holotype) or absent. Distally cell r_1 without hyaline spots [#6]. Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending more or less parallel to costa into cell r_{2+3} to or almost to vein R_{2+3}, slightly or not tapering anteriorly, slightly to much broader than marginal brown area. Cells m and r_{4+5} with inverted V-shaped mark [fusion of #26A, #26, #27, #29 plus additional spots], extending anteriorly more than halfway across r_{4+5} but not reaching vein R_{4+5}, both arms reaching posterior margin in cell m. Cell br with subbasal hyaline spot [#12], minute in 1 Upala male. Cell bm with circular subbasal and subapical hyaline spots [#19, #20] or 1 large ovoid or irregular medial hyaline spot [fused #19 and #20]. Posteromedial part of wing with 2 rows of more or less aligned hyaline spots or bands, these marks usually partially fused at least posteriorly in cell dm; cell br with subapical hyaline spot [#13] only, aligned with mark in cell dm [#21]; cell dm with separate narrow oblique proximal mark [#21, #22? or #52?] and distal posteromedial spot [#24 or fused #23 and #24] (1 wing of holotype), with anteriorly narrow and posteriorly broad mark [fusion of #21, #22, #23, #24], or with broad, anteriorly bifurcate mark [fusion of #51, #52?, #21,

#22, #23, #24]; cell cu_1 with 2 hyaline bands, often connected medially to form H-shaped mark, proximal band [fusion of #34, #39, #32, sometimes #31?] crossing vein A_1+Cu_2 and aligned with proximal band or proximal part of mark in cell dm, distal band [fusion of at least #33, #36] aligned with distal spot or distal part of mark in cell dm; subapical marginal hyaline mark [#37] absent. Cell dm without subapical spot [#25].

Abdomen: Mostly yellow. Tergites with pair of dark brown vittae, narrow in holotype but broad in males, mark on syntergite 1+2 sometimes isolated as spot or (holotype) absent, not extending to lateral margins of tergites and separated medially by broad, tapering, straight margined yellow area; brown vittae solid, without yellow spots within them; lateral margins of tergites without brown markings.

Female terminalia: Oviscape entirely dark brown; length 0.90 mm. Aculeus (Fig. 126) 0.65 mm long, 1.7 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip flared outward basolaterally, short and broad (lobed part 0.23 times as long as wide), with broad, relatively shallow medial apical concavity (1/4 as deep as length of medial lobes and about half as broad as distance between apices of submedial lobes) and with 4 pairs of lobes; lateral lobe projecting, moderately broad and blunt, separated from sublateral lobe by deep gap; other lobes step-like, sublateral lobe slightly larger than submedial lobe. Spermathecae subspherical, neck with very short, straight, weakly sclerotized basal part, abruptly expanded to very stout, cylindrical, sclerotized part, and with large stout cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta as large as medial prensiseta.

Distribution. Low to middle elevation areas of Costa Rica and Nicaragua.

Type data. Holotype ♀ (USNM USNMENT00213023), NICARAGUA: Atlántico Norte: Cerro Cola Blanca, Río Las Latas, 14°04'N 84°33'W, 220 m, 2 Jun 1997, J. M. Maes & B. Hernandez. Paratypes: COSTA RICA: Alajuela: Upala, 20 km S of, 11–15 May 1990, F. D. Parker, 1♂ (USU USNMENT00054202); same, Jun 1990, 1♂ (USU USNMENT00213822). Cartago: Turrialba, 24 Jun 1951, O. L. Cartwright, 1♂ (USNM USNMENT00213823).

Etymology. The name of this species is an adjective referring to the single pair of scutal vittae.

Remarks. The female holotype differs from the male paratypes by its lack of brown marks on the scutellum and the posterior margin of the scutum. The holotype and the Turrialba male have a more distinct and transverse medial brown spot in cell c. Rearing and study of additional specimens would be useful to test our hypothesis that these specimens are conspecific.

Blepharoneura brevivittata Norrbom & Condon, new species

Figs. 17–20, 96–97, 124, 127

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, usually without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: vertex with brown spot or band surrounding medial vertical seta; scutum with pair of submedial brown vittae, interrupted at transverse suture, and with brown band or triangular to trapezoidal mark on posterior margin; anepisternum without brown markings; abdominal tergites with pair of broad solid dark brown vittae without yellow spots and with even margins, not extending to lateral margins of tergites, which are yellow; cell c hyaline to diffuse pale brown except margins (without complete brown medial mark dividing distinct subbasal and subapical hyaline spots); distal hyaline mark in cell m ending at vein M or at most extending midway across cell r_{4+5}. The aculeus of *B. brevivittata* resembles those of *B. bivittata* and *fernandezi* in having a very broad, deep medial concavity. It is intermediate between those two species in the width of the medial concavity, and the relative length of the tip is less than in both species.

Description. Head: Dark brown area on ocellar tubercle almost always (17 of 18 specimens) extended beyond postocellar seta. Medial vertical seta in ovoid or triangular dark brown spot mostly posteromesal to

seta or in narrow to broad band extended to opposite seta and usually connected to area on ocellar tubercle. Occipital suture narrowly dark orange to red brown. Sometimes with diffuse paler brown spot or small area including or ventral to lateral vertical seta.

Thorax (Figs. 96–97): Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, with pair of broad dark brown submedial presutural vittae, usually broadest at level of posterior margin of postpronotal lobe, usually extended almost to transverse suture. Posterior margin with broad, usually dark brown mark, variable in shape, usually triangular or trapezoidal, sometimes elongate, occasionally short and nearly linear (in Peruvian ♀ with 3 very narrow interruptions medially), often with paler submedial and/or sublateral vittae extending anteriorly, or with small isolated submedial spots. Scutellum entirely yellow (6 specimens), or with pair of submedial or sublateral brown spots, usually small, but moderately large in 2 males and extended to basal setae in one. Subscutellum and mediotergite rarely entirely yellow (Peruvian ♀), usually mediotergite with pair of broad brown vittae, sometimes reaching lateral margin, often (9 of 18 specimens) extended onto ventral half of subscutellum. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta or with intra-alar seta.

Legs: Entirely yellow.

Wing (Figs. 17–20): Length 6.10–6.80 mm, width 2.80–3.37 mm, ratio 2.00–2.18. Crossvein r-m at 0.52–0.59 distance from bm-cu to dm-cu. Cell c hyaline to diffuse pale brown except for darker brown basal area, very narrow slightly darker brown elongate medial or medial to distal area on costal margin, and dark brown distal area. Pterostigma occasionally (5 of 18 specimens) with large pale brown subapical spot [#3], sometimes reaching R_1, but usually without spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with slightly to usually strongly tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot in r_{2+3} [#8] and sometimes r_{4+5} [#14] forming acute triangular to nipple-shaped mark, usually reaching R_{4+5} (except in 1 specimen and 1 wing of 2 others), or sometimes (5 of 17 specimens) extended into but less than midway across r_{4+5} or rarely (1 specimen) with narrowly isolated aligned spot in r_{4+5}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small or usually minute, often yellowish, occasionally absent. Distally cell r_1 without hyaline spots [#6]. Cell r_{2+3} usually without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending more or less parallel to costa into cell r_{2+3}, usually almost reaching vein R_{2+3}, occasionally (3 specimens) reaching it and rarely (1 wing of 1 specimen) also reaching costa, often irregular with slight constrictions, especially along vein R_{4+5}, slightly to much broader than marginal brown area. Cells m and r_{4+5} usually with inverted V-shaped mark [fusion of #26A, #26, #27, #29 plus additional spots], extending anteriorly halfway across cell r_{4+5}, but distal arm often constricted along vein M or connected to proximal arm only within cell m, occasionally (2 Costa Rican specimens) with 2 separate marks, only proximal mark extending into r_{4+5}, or (Peruvian ♀) with 2 marks and neither (1 wing) or only distal mark extending into r_{4+5}; both arms or marks reaching posterior margin in cell m. Cell br usually with subbasal hyaline spot [#12], absent in Peruvian female. Cell bm usually without circular subbasal hyaline spot [#19] (present in 2 Costa Rican specimens), usually with circular medial or subapical hyaline spot [#20], absent in Peruvian female. Posteromedial part of wing with 2 (Panama ♂) or usually 3 sets of aligned, partially fused spots and bands or with single broad, more fused irregular marking; cell br with subapical hyaline spot [#13] and often (10 specimens on at least 1 wing) with more proximal small posterior yellowish or hyaline spot [#44]; cell dm usually (except in Panama ♂) with elongate subbasal hyaline mark [fused #51, #52] aligned with spot [#44] in cell br (when present) and proximal anterior spot in cell cu_1 [#31], separate (Peru ♀) or (Costa Rican specimens) with this mark partially or completely fused to somewhat L-shaped mark [fused #21, #22, #24, sometimes #50] to form elongate mark, longer posteriorly than anteriorly; cell cu_1 with proximal anterior spot [#31] aligned with subbasal mark in cell dm absent (Panama ♂), small and isolated (Peru ♀), or usually (most Costa Rican specimens) connected with or fused to posteromedial hyaline mark [fusion of #32, #33, #36] to form trident shaped or vase shaped mark, or with this mark also connected to mark crossing vein A_1+Cu_2 [fused #34, #39]; subapical marginal hyaline mark [#37]

usually present, sometimes small or diffuse, absent in 1 Costa Rican specimen. Cell dm usually without subapical spot [#25], small in 3 Costa Rican specimens, rarely (1 wing of 1 Costa Rican ♀) larger but broadly connected to large medial hyaline area.

Abdomen (Fig. 124): Yellow, with pair of broad dark brown vittae on all tergites, mark on syntergite 1+2 sometimes isolated as spot, vittae with relatively even margins, not extending to lateral margins of tergites and separated medially by broad, tapering, straight margined yellow area; brown vittae solid, without yellow spots within them; lateral margins of tergites without brown markings.

Female terminalia: Oviscape entirely dark brown; length 0.85–1.00 mm. Aculeus (Fig. 127) 0.72–0.80 mm long, 1.56–1.58 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip flared outward basolaterally, short and broad (lobed part 0.17–0.21 times as long as wide), with broad, moderately deep medial apical concavity (almost as deep as length of medial lobes and about half as broad as distance between apices of submedial lobes) and with 4 pairs of lobes separated by deep gaps; lateral lobe projecting, moderately broad and blunt; sublateral lobe smaller and narrower but also projecting, with 1 to several minute serrations; submedial lobe smaller and more step-like; medial lobe short and blunt. Spermathecae subspherical to subconical or with apical projection, neck with very short, straight, weakly sclerotized basal part, abruptly expanded to very stout, cylindrical, sclerotized part, and with large stout cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta subequal to medial prensiseta.

Distribution. Lowland areas of Costa Rica, Panama, and eastern Peru.

Type data. Holotype ♀ (USNM USNMENT00048914), COSTA RICA: Puntarenas: R.F. Golfo Dulce, 3 km SW of Rincon, 84°02'N 83°29'W, 10 m, Mar 1993, P. Hanson. Paratypes: COSTA RICA: Limón: Guácimo, 7 mi N, 4–7 Mar 1988, F. D. Parker, 1♂ (USU USNMENT00213934). Puntarenas: R.F. Golfo Dulce, 3 km SW of Rincon, 84°02'N 83°29'W, 10 m, Oct 1992, P. Hanson, 1♂1♀ (UCR SJUSNMENT 00048511, USNM ENT00048513) 1♂1♀ (INBio USNMENT00048514–15) 1♂ (USNM USNMENT 00048516); same, Nov - Dec 1992, 1♂3♀ (USNM USNMENT00048518–21); same, Mar 1993, 1♀ (USU USNMENT00048915) 1♀ (USNM USNMENT00048916); same, Apr 1993, 2♀ (USNM USNMENT00048491–92); Rincon de Osa, 31 Jul 1966, D. F. Veirs, 1♂ (USU USNMENT00054203). PANAMA: Cano Saddle, Gatun L., 13 May 1923, R. C. Shannon, 1♂ (USNM USNMENT00213935). PERU: Huánuco: Tingo María vicinity, 1–5 Jun 1999, W. Hanson & S. Keller, 1♀ (USNM USNMENT00213533).

Etymology. The name of this species is an adjective referring to the short or interrupted scutal vittae.

Blepharoneura species near *brevivittata*

Figs. 21–22

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}, although the subapical band is very narrowly separated from the costa anteriorly in that cell, and it might therefore be confused with *B. unifasciata*, in which the band reaches the margin. It differs from the other obliquely banded species by the following combination of characters: vertex with brown spot or band surrounding medial vertical seta; anepisternum and scutellum without brown markings; scutum with pair of presutural submedial brown vittae, without lateral vittae, and without brown markings posteriorly; cell c with 2 distinct subrectangular hyaline spots, both reaching costa and subcosta; pterostigma with subapical hyaline spot; hyaline marks in cell m not extending into cell r_{4+5}, and r_{4+5} without aligned spots.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Medial vertical seta in ovoid dark brown area mostly posteromesal to seta. Occipital suture narrowly orange brown.

Thorax: Scutum with pair of dark red brown submedial, presutural vittae, extended to slightly beyond transverse suture. Posterior margin without brown marks. Scutellum nonmicrotrichose except posterior to dorsocentral seta and laterally, entirely yellow. Subscutellum, mediotergite and pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta.

Legs: Entirely yellow.

Wing (Figs. 21–22): Length 5.45–5.84 mm, width 2.77–2.97 mm, ratio 1.96–1.97. Crossvein r-m at 0.52–0.56 distance from bm-cu to dm-cu. Cell c with 2 subrectangular hyaline spots, both reaching costa and subcosta; medial brown area slightly to distinctly paler than area of cell r_1 posterior to pterostigma, as broad as to distinctly narrower than hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot [#8] in r_{2+3}, forming acute triangular to nipple-shaped mark, extended to R_{4+5}; cell r_{4+5} with small spot [#14], extended less than halfway across cell, slightly isolated and aligned with r_1 mark or partially touching it and slightly more distal; cell r_{2+3} sometimes with second, slightly more distal, small hyaline spot [#9], touching R_{4+5} but not reaching R_{2+3}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small to moderate sized. Distally cell r_1 without hyaline spots [#6] (Peruvian ♂) or with only posterior hyaline spot (Brazilian ♂). Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending almost to vein R_{2+3} and in anterior half of r_{2+3} almost reaching costa so that brown margin distinctly narrower than along vein R_{4+5}. Cell m with 2 marginal hyaline marks, proximal mark [#27] extending halfway to vein M or fused to anterior spots [#26, #26A] to form band extending to vein M, distal mark [at least #29] extending to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with or without circular subbasal hyaline spot [#19], with subapical spot [#20]. Posteromedial part of wing with 3 elongate hyaline marks or series of aligned marks; cell br with subapical hyaline spot [#13] and sometimes (Brazilian ♂) with more proximal small posterior hyaline spot [#44]; cell dm with elongate subbasal hyaline mark [fused #51, #52], in Brazilian male aligned with more proximal spot [#44] in cell br and proximal spot in cell cu_1 [#31]; cell dm also with small anterior hyaline spot [#21] and broader posterior spot [#22, #23, #24] (1 wing of Peruvian ♂) or larger hyaline mark [fused #21, #22, #23, #24] broader posteriorly, aligned anteriorly with subapical spot in cell br [#13], in Brazilian male connected posteriorly to subbasal mark; cell cu_1 with (Brazilian ♂) or without small anterior proximal hyaline spot [#31], medially with 2 elongate hyaline bands, more proximal one [fused #32, #34, #39] crossing vein A_1+Cu_2 and aligned with (Brazilian ♂) or almost with (Peruvian ♂) proximal part of more distal mark in cell dm, distal band [including #33, #36] sometimes not reaching vein Cu_1 anteriorly (1 wing of Peruvian ♂), aligned with distal part of distal mark in dm, bands together with distal mark in dm forming or almost forming inverted-V or Y shaped mark; subapical marginal hyaline mark [#37] small or absent or narrow and elongate. Cell dm with subapical hyaline spot [#25] small to moderate sized, sometimes (Brazilian ♂) extended to vein M.

Abdomen: Mostly yellow. Tergites 4 and 5 (Peruvian ♂) or 3–5 (Brazilian ♂) with pair of broad red brown to dark brown submedial vittae or rows of spots, not extended to lateral margin except at posterolateral corner of tergite 5; markings solid brown, without yellow spots within them, broadly separated medially, with tapering, straight margins; lateral margins of tergites without brown markings.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta subequal to medial prensiseta.

Distribution. Lowland areas of Brazil (Pará) and Peru (Madre de Dios).

Specimens examined. BRAZIL: Pará: Santarém, 1♂ (CMP USNMENT00213932). PERU: Madre de Dios: Manu, Río Manu, Pakitza, 12°07'S 70°58'W, 250 m, 9–23 Sep 1988, A. Freidberg, 1♂ (USNM USNMENT00213931).

Remarks. It is possible that the two examined males are variant specimens of *B. brevivittata*. They are similar to that species in wing pattern, especially to the Peruvian female, in the markings of cells dm and cu_1 and m and r_{4+5}. They differ from *B. brevivittata* in having distinct hyaline marks in cell c separated by a medial

brown area and in lacking brown markings posteriorly on the scutum, although it should be noted that the posterior scutal mark is narrow and interrupted in the Peruvian female of *B. brevivittata*, which also is the only specimen of that species lacking brown markings on the subscutellum and mediotergite. They also have a subapical hyaline spot in cell dm [#25] which is usually absent in *B. brevivittata*. We are uncertain whether they represent an undescribed species without having clearly associated female specimens. The male from Brazil is in poor condition.

***Blepharoneura chaconi* Norrbom & Condon, new species**
Figs. 23–24, 87, 108, 116–117, 149

Diagnosis. This species differs from other species of *Blepharoneura* by the following combination of characters: Scutellum with pair of submedial brown marks or with single large inverted U-shaped or inverted triangular brown mark; anepisternum entirely yellow; notopleuron with brown spot lateral to posterior seta; anepimeron with brown mark on posterior half; and cell r_{4+5} proximal to dm-cu more extensively hyaline than brown. The aculeus is most similar to *B. mikenoltei* and *mexicana*, lacking small scales on the medial membrane, and the tip with a moderately broad medial concavity and 4 pairs of step-like lobes, but the gap between the medial and submedial lobes is shallower than in both of those species.

Description. Head (Fig. 87): Dark brown area on ocellar tubercle extended well beyond postocellar seta (by distance equal to distance between postocellar setae), subtriangular beyond seta. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Postpronotal lobe entirely yellow or with minute brown spot at junction with anepisternum. Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta occasionally narrowed slightly posterior to transverse suture but uninterrupted and extended to or almost to level of dorsocentral seta, rarely (1 specimen [USNMENT00048386]) connected to mark on posterior margin; sublateral vitta narrowly interrupted at transverse suture and narrowly separated from mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially. Notopleuron on lateral margin with brown spot posteriorly, usually (11 of 16 specimens) also with smaller anterior spot. Small brown spot anterior to postsutural supra-alar seta present, sometimes (4 of 16 specimens) faint. Brown vitta anterior to postalar seta present, sometimes (5 of 16 specimens) faint. Brown spot, usually large, lateral to dorsolateral corner of scutellum present. Scutellum with pair of triangular submedial brown marks or with single inverted U-shaped or large inverted triangular brown mark. Subscutellum and mediotergite brown except narrow medial vitta orange and extreme dorsolateral corner of mediotergite yellow. Pleuron (Fig. 108) yellow, with following brown areas: small to large spot on posterior half of anepimeron; dorsal, posterior and ventral edges of katatergite; all of anatergite; large spot on meron; and sometimes 1–2 small spots or (3♂) 1 large triangular mark on katepisternum. Basalare entirely yellow. Dorsocentral seta aligned with or usually slightly anterior to postalar seta.

Legs: Mostly yellow. Mid and hind femora with elongate, usually moderately broad anteroventral and posteroventral dark orange to red brown marks on apical 1/4–1/3.

Wing (Figs. 23–24): Length 6.50–8.02 mm, width 2.70–3.47 mm, ratio 2.18–2.41. Crossvein r-m at 0.58–0.63 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline to subhyaline spots, both reaching costa and subcosta but often fading to pale brown on margins, especially posteriorly, or basal spot often mostly pale brown; medial brown area as dark as to slightly paler than area of cell r_1 posterior to pterostigma, often paler medially, as broad as to broader than basal hyaline spot and usually as broad as to broader than distal spot. Pterostigma often without subapical hyaline spot (9 of 16 specimens), but small to large spot [#3] frequently present, sometimes (4 of 16 specimens) reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 2–3 and 0–2 pale brown to hyaline spots, respectively. Radial cells medially with 1 relatively narrow, rounded quadrate to inverted trapezoidal basal hyaline mark [#5] in cell r_1; cell r_{2+3} with broad hyaline spot [#8] aligned with or slightly proximal to r_1 mark, and slightly more distal very broad

hyaline spot [#9]; cell r_{4+5} with large hyaline spot [#14] aligned with r_1 mark and very large spot [#15] (more than 3/4 width of cell) slightly proximal to anterior end of dm-cu, usually connected or fused into 1 large irregular hyaline spot, and with small anterior spot [#48] near midlength. Distally cell r_1 usually with 1 small marginal hyaline spot [#6] (absent in 2 specimens, second spot present on 1 wing of 1 specimen), usually also with 1–2 small hyaline posterior spots. Cell r_{2+3} with 1–2 marginal hyaline markings (with elongate proximal marginal mark [#10] extending to R_{4+5} and 1 smaller rounded submarginal or marginal spot [#11] or with 1 elbow-shaped mark [fused spots #10 and 11] reaching costa proximally and sometimes distally). Cell r_{4+5} with small hyaline spot [#16] on anterior margin aligned between apical marks in cell r_{2+3} or aligned with more distal spot, with large posterior hyaline spot aligned with proximal spots in cell m and sometimes with smaller hyaline spot aligned with distal mark in m, and with 1 small rounded submarginal or marginal hyaline spot [#18]. Cell m often with small proximal hyaline spot [#49] near midlength of dm-cu and with 1–3 large hyaline markings (2 marginal [#27, 29] and 1 anteromedial [fused #26A, #26] spots, anteromedial and proximal mark often partially connected or fused, or occasionally all 3 connected to form inverted V), anteromedial and distal spots often touching vein M. Cell br usually with subbasal hyaline spot [#12]. Cell bm usually with circular subbasal hyaline spot [#19], with larger subapical hyaline spot [#20], or with single broad hyaline area [fused #19, #20]. Cell bcu occasionally with irregular diffuse area in lobe but without distinct spot. Posteromedial part of wing with large broad hyaline areas; cell br with broad subapical hyaline spot [#13] and smaller more proximal spot [#44], occasionally partially fused; cell dm with long broad hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50] aligned with large hyaline mark in cell cu_1, anteriorly extended almost to or beyond level of r-m, transverse or tapered distally, extending as far as or farther posteriorly than anteriorly; cell cu_1 with large medial hyaline area [fusion of at least #31, #32, #33, #34, #36], usually anteriorly trilobed and posteriorly bilobed, including 2 (rarely 1) anterior and 1 subbasal marginal or submarginal brown spots; subapical marginal hyaline spot [#37] large, reaching or almost reaching vein Cu_1. Cell dm with moderately large anterior subapical hyaline spot [#25?] and 1 small to moderate sized posterior hyaline spot [#53] aligned with subapical mark in cell cu_1.

Abdomen (Figs. 116–117): Yellow with dark brown spots to predominantly dark brown. Syntergite 1+2 with 4 evenly spaced spots and 2–4 spots or bands on posterior margin, not connected medially, some or all more anterior spots occasionally connected with posterior spots or bands. Tergites 3–6 with 4 rows of evenly spaced dark brown spots and with lateral and posterior margins also dark brown, on posterior margin separated medially except sometimes on male tergite 5. Some or all spots and bands on tergites 3–6 frequently connected except medially where there is narrow irregularly margined vitta, in 3 specimens spots and bands largely fused, but at least medial vitta, anterior submedial yellow spot on tergites 3–5, and anterior sublateral yellow spot on tergite 3 present.

Female terminalia: Oviscape entirely dark brown; length 1.20–1.40 mm. Aculeus (Fig. 149) 0.90 mm long, 2.80–3.05 times as long as wide, without scales dorsally or ventrally on membrane medially; tip angular basolaterally, relatively short triangular (lobed part 0.43–0.46 times as long as wide), with moderately broad shallow medial apical concavity (less than 1/3 as broad as distance between apices of submedial lobes) and 4 pairs of step-like lobes; sublateral lobe larger than submedial lobe; lobes separated by relatively deep gaps, lateral gap 1.87–2.00 times as long as wide, gap between medial and submedial lobes about 1/3 as long as wide. Spermathecae subspherical, with straight, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on curved lobe, lateral prensiseta small to minute, less than one-fourth as wide as medial prensiseta, acute, and orange brown (similar in color to medial surstylus, not dark brown like medial prensiseta).

Distribution. Costa Rica. The type specimens were collected at 2200–2600 m elevation.

Type data. Holotype ♀ (INBio INBio002151664), COSTA RICA: San José: San Gerardo de Dota, 400 m W of Albergue Savegre, LS 389000 484200, 2200–2300m, collected on *Cyclanthera* sp., on underside of leaf, abdomen green when alive, 21 May 1997, E. Rojas 97–ER-076. Paratypes: COSTA RICA: San José: Cerro de

la Muerte, Estación Biológico Cuericí, 9°32'N 83°42'W, 2600 m, Malaise trap, Dec 1999, P. Hanson, 1♂ (UCRSJ USNMENT00213572); Río Savegre, 9°35'N 83°48'W, 2450 m, 29 Jun 2001, A. Freidberg, 1♂ (TAUI USNMENT00056536); San Gerardo de Dota, along Río Savegre, 9°33'N 83°48'W, 2200 m, on *Sechium pittieri* (Cogn.) C. Jeffrey (95CR15), possibly feeding on flowers, 8–10 Aug 1995, M. A. Condon & A. L. Norrbom, 2♀ (USNM USNMENT00048384–85); same, on *Sechium pittieri* (95CR15), 18–21 Aug 1995, A. L. Norrbom, 2♀ (USNM USNMENT00048388–89); same, on *Cyclanthera langaei* Cogn. (95CR14) or *Sechium pittieri* (Cogn.) C. Jeffrey (95CR15), mixed patch of plants, end of log site, 21 Aug 1995, A. L. Norrbom, 1♂ (USNM USNMENT00048390); San Gerardo de Dota, Albergue Savegre, LS 389000 484200, 2200–2500 m, 19–22 May 1997, F.A. Quesada, 2♂2♀ (INBio INBIO002410492, INBIO002410545–46, INBIO002410549); same, 19 May 1997, E. Rojas, 1♂ (USNM INBIO002539948) 1♂ (INBio INBIO002539949); San Gerardo de Dota, Finca Miguel Viquez, on stems or leaves of *Sechium pittieri* (Cogn.) C. Jeffrey (95CR15), 18–21 Aug 1995, A. L. Norrbom, 1♂ (USNM USNMENT00048386) 1♀ (CDFA USNMENT00048387).

Etymology. The name of this species is a noun in the genitive case honoring Ephraim Chacon, who along with his family and neighbors, preserved the forest that includes the type locality.

Biology. Adult specimens have been collected at San Gerardo de Dota, Costa Rica on *Cyclanthera langaei* Cogn. and, more commonly, on *Sechium pittieri* (Cogn.) C. Jeffrey (Figs. 210–211). Plants of two *Sechium* species and *C. langaei* frequently grow together at this locality. The adults presumably feed on leaf, stem, or some type of green plant tissues because the abdomen of one specimen had green contents when alive. Two females were observed with their heads in flowers of *Sechium*, possibly feeding, so this may be the more likely host plant. It is possible that the unidentified larvae feeding in nodes of this plant (see Biology section and Figs. 212–214) could be *B. chaconi*.

***Blepharoneura cornelli* Norrbom & Condon, new species**
Figs. 25, 121, 128

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: vertex with brown spot or band surrounding medial vertical seta; medial occipital sclerite with pair of brown submedial vittae on ventral half; anepisternum without brown markings; pterostigma without subapical hyaline spot; cell r_{4+5} without hyaline spot near crossvein dm-cu; subapical hyaline band not extended anteriorly to vein R_{2+3} nor with aligned posterior spot in cell r_1 but extended proximally beyond the apex of the proximal hyaline band originating in cell m; and abdominal tergites 3–5 with brown mark or spot on lateral margin. The aculeus is similar to those of *B. rupta* and *furcifer*, with minutely serrate, digitate lateral and broad slanted sublateral lobes, a step-like submedial lobe, and unpaired truncate or convex medial lobe, but the lateral lobe is narrower than in those species and the medial lobe is shorter than in *B. rupta*.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Small dark brown area surrounding and extending posteromesal to medial vertical seta. Medial occipital sclerite with pair of faint brown submedial vittae on ventral half. Occipital suture narrowly dark orange.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, mostly yellow, with pair of short comma-shaped pale brown vittae near anterior margin aligned with medial corner of postpronotal lobe. Scutellum, subscutellum, mediotergite, and pleuron entirely yellow. Basalare yellow. 2 pairs of dorsocentral setae present (missing in holotype except left posterior seta), posterior pair aligned between postalar and intra-alar setae, anterior (supernumery) pair aligned slightly anterior to postalar seta (right socket is slightly off dorsocentral line towards midline).

Legs: Mostly yellow. Mid femur with narrow anteroventral brown mark on apical 1/4.

Wing (Fig. 25): Length 5.95 mm, width 2.92 mm, ratio 2.03. Crossvein r-m at 0.51 distance from bm-cu to dm-cu. Cell c with 2 ovoid hyaline spots, neither reaching costa or subcosta, separated by very pale brown medial area with incomplete dark brown margins, rest of brown area except in base of cell as dark as area of cell r_1 posterior to pterostigma, medial brown area broader than basal hyaline spot, as broad as distal spot. Pterostigma without subapical hyaline spot. Cell r_1 brown except tapering nipple-shaped basal marginal hyaline mark [#5] extended to R_{2+3}. Cell r_{2+3} without hyaline spots basal to level of dm-cu. Cell r_{4+5} with small hyaline spot [#14] touching R_{4+5} slightly distal to level of hyaline mark in r_1; without hyaline spot [#15] near dm-cu. Distally cell r_1 without hyaline spots [#6], and cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending more or less parallel to costa into cell r_{2+3} almost reaching vein R_{2+3}, slightly tapering anteriorly, much broader than marginal brown area. Cells m and r_{4+5} with inverted V-shaped hyaline mark [fusion of at least #26A, #26, #27, #29], extending anteriorly to vein R_{4+5}, both arms reaching margin in cell m. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with 2 elongate hyaline marks, proximal one [aligned or fused #13, #21, #22, #32, #34, #39] extended from subapically in cell br to apex of vein A_1+Cu_2, sometimes narrowly interrupted anteriorly in cell dm or anteriorly in cell cu_1, broadly connected posteriorly in cell dm to distal mark [aligned and fused #23, #24, #33, #36] extending to posterior wing margin in middle of cell cu_1; cell cu_1 subapical marginal hyaline mark [#37] moderate sized or absent. Cell dm without subapical hyaline spot [#25].

Abdomen (Fig. 121): Tergites 3–6 each with submedial dark brown mark and narrow posterolateral dark brown mark; submedial markings broadly separated but with irregular margins, on tergite 3 connected with lateral mark on posterior margin to form trimodal mark, on tergites 4 and 5 U-shaped, and on tergite 6 divided into 2 spots, more lateral one connected to lateral mark on anterior margin; lateral mark on tergites 5–6 extended along entire lateral margin.

Female terminalia: Oviscape entirely dark brown; length 0.98 mm. Aculeus (Fig. 128) 0.87 mm long, 2.05 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip slightly flared outward basolaterally, short triangular (lobed part 0.41 times as long as wide), with short broad truncate medial lobe and 3 pairs of lobes; lateral lobe large and digitiform, with minute serrations apically; sublateral lobe very broad and slanted, minutely serrate; submedial lobe small and step-like. Spermathecae subspherical, with strongly convoluted, broad sclerotized neck and with or without small cylindrical basal apodeme (similar to *B. furcifer*).

Distribution. Costa Rica. The holotype was collected between 50–150 m elevation.

Type data. Holotype ♀ (INBio INBio001228576), COSTA RICA: Heredia: 3 km S of Puerto Viejo, Estación Biológica La Selva, 10°26'N 84°01'W, 50–150 m, 1 Jul 1993.

Etymology. In gratitude for financial support for our research on *Blepharoneura*, the name of this species is a noun in the genitive case honoring Cornell College, an innovative liberal arts college in Mount Vernon, Iowa that supports collaborative research between students and faculty.

Blepharoneura cyclantherae Norrbom & Condon, new species

Figs. 26, 137

Blepharoneura femoralis: Condon & Norrbom 1999: 161 [misidentification].

Diagnosis. This species belongs to the *femoralis* complex (see diagnosis of *B. femoralis*), species of which are difficult to distinguish except by aculeus shape. That of *B. cyclantherae* differs from those of *B. osmundsonae* and *nigrifemur* in having the tip stouter (lobed part half as long as wide) and not rounded proximal to the lateral lobe. The lobes, particularly the lateral one, are more acute than in other species except *B. osmundsonae* and the gaps are shallower than in *B. femoralis* which also has a convex medial lobe. The

sublateral lobe also is similar in size to the submedial lobe, unlike in *B. zumbadoi* and *femoralis*. *Blepharoneura cyclantherae* also differs from *B. osmundsonae* in having acute rather than polygonal scales on the medial membrane, and they are present only dorsally and are less extensive than in other species of the complex.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta (except in teneral ♂). Medial vertical seta in yellow area. Medial occipital sclerite with pair of brown submedial vittae on ventral half. Occipital suture narrowly dark brown, on lateral side bordered by slightly paler band, extended dorsolaterally to postocular setae but well separated dorsally from lateral vertical seta.

Thorax: Scutum with large irregular medial nonmicrotrichose area, extending posteriorly to transverse suture and on submedial vittae to midway between suture and dorsocentral seta, extending laterally to lateral margin of submedial vitta and on posterior half of presutural part to lateral margin of sublateral vitta, also with at least a small nonmicrotrichose area on anterior half of postsutural sublateral vitta; scutum also with 2 pairs of dark brown vittae or rows of spots; submedial vitta interrupted or narrowed slightly posterior to transverse suture and not connected to mark or marks on posterior margin; sublateral vitta broadly interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 2 brown marks or with 1 broad mark narrowed medially. Notopleuron with dark brown vitta on lateral margin. Small brown spot anterior to postsutural supra-alar seta present or absent. Brown vitta anterior to postalar seta and brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of submedial brown marks or single inverted U-shaped medial mark usually extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae and ventral half of lateral margin of mediotergite also narrowly brown or both sclerites brown except narrow medial vitta and dorsolateral corner of mediotergite yellow. Pleuron mostly dark brown, yellow only on propleuron, most of anepisternum (with large dorsomedial dark brown spot extending ventrally 1/3–2/3 distance to ventral margin, and narrowly brown in posteroventral corner), extreme anterior and posterior corners of katepisternum, all of katepimeron, greater ampulla, narrow dorsal, posterior and ventral margins of anepimeron, and narrow posterodorsal margin of katatergite and anterodorsal margin of anatergite. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur sometimes with anteroventral and posteroventral brown marks on apical 1/5–1/4. Hind femur with entire apical 1/4–1/3 dark brown.

Wing (Fig. 26): Length 5.50–6.00 mm, width 2.70–2.88 mm, ratio 2.04–2.08. Crossvein r-m at 0.56–0.57 distance from bm-cu to dm-cu. Cell c with 2 broad rectangular hyaline spots, both reaching costa and subcosta; medial brown area almost as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, distinctly narrower than both hyaline spots. Pterostigma usually with large subapical hyaline spot [#3] (absent in 1 of 3 specimens) but usually not reaching R_1 (on 1 wing of 1 specimen). Cell r_1 basally (proximal to apex of R_1) with pale brown spot posterior to apex of vein Sc; cell r_{2+3} occasionally (1 wing of 2 specimens) with 1 pale brown spot. Radial cells medially with 1 broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1, sometimes with very small pale brown spot partially dividing it posteriorly; cell r_{2+3} with 2 hyaline spots [#8, #9] or usually 1 broad hyaline spot aligned with r_1 mark, extending across cell; cell r_{4+5} in anterior half sometimes with small hyaline spot [#14] aligned with middle of r_1 mark, less than half as wide as cell, sometimes minute or absent, and with medial hyaline spot [#15] near anterior end of dm-cu small. Distally cell r_1 with or without 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 large marginal hyaline marks [#10, #11], proximal mark sometimes constricted medially or divided into marginal and posterior spots. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned with more proximal or between apical marks in cell r_{2+3}; with 1 ovoid hyaline spot in posterior half of cell aligned with distal mark in cell m, in 1 specimen fused with posterior marginal spot; and with 2 ovoid marginal or submarginal hyaline spots [#18, #18A]. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 2 marginal hyaline spots [#27, #29] and 1 large anteromedial spot [fused #26, #26A], narrowly separated from proximal marginal spot and vein M. Cell br with subbasal hyaline spot [#12]. Cell bm without subbasal hyaline spot [#19], with large circular subapical hyaline spot [#20]. Cell bcu with or without hyaline spot in

lobe. Posteromedial part of wing with large broad hyaline areas; cell br with subapical hyaline spot [#13]; cell dm with broad and long hyaline area [fusion of at least #52, #21, #22, #23, #24, sometimes #50], sometimes narrowly or partially divided by pale brown medially, narrowly separated from or reaching vein M proximally, sometimes extended to level of r-m anteriorly, tapered distally, extending farther posteriorly than anteriorly; cell cu_1 with large medial anteriorly trilobed and posteriorly 1–2 lobed mark or with more broadly fused area with 0–2 anterior and 1–2 marginal brown spots [fused #31, #32, #33, #36, sometimes #36A], broad on posterior wing margin, proximal marginal part [#34, #39] across apex of vein A_1+Cu_2 sometimes narrowly isolated; subapical marginal hyaline spot [#37] reaching vein Cu_1. Cell dm with anteromedial subapical hyaline spot [#25] sometimes connected to proximal hyaline area.

Abdomen: Syntergite 1+2 with pair of submedial brown spots narrowly connected to posterolateral brown bands to form pair of irregular marks. Tergites 3–5 with typical 2 pairs of spots and L-shaped posterolateral bands fused to form pair of irregular somewhat W-shaped lateral dark brown marks, separated medially, or with submedial spots sometimes isolated, sublateral spots also isolated on tergite 5 of 1 female; usually also with isolated anterolateral spot.

Female terminalia: Oviscape entirely dark brown, length 0.97 mm. Aculeus (Fig. 137) 0.55 mm long, 1.94–2.00 times as long as wide, with acute scales proximally on medial membrane dorsally, but without scales ventrally; tip angulate basolaterally, slightly elongate triangular (lobed part 0.48–0.49 times as long as wide), with small, notched medial lobe, and 3 pairs of step-like lobes with small acute apices separated by relatively shallow gaps; sublateral and submedial lobes similar in size; lateral gap 0.89–1.00 times as long as wide. Spermathecae subspherical, with straight slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

Male terminalia: Medial surstylus with medial prensiseta on long lobe, lateral prensiseta absent.

Distribution. Mexico (Morelos). The type locality is at approximately 2170 m elevation.

Type data. Holotype ♀ (IEXV USNMENT00052303), MEXICO: Morelos: near Huertas de San Pedro, Rt. 95 (libre), junction of road to Huitzilac (near km 65), [19°00'06"N 99°15'34W], emerged 24 Aug 1992 reared ex fruit of *Cyclanthera dissecta* Arn. (91M24) coll. 27 Sep 1991, A. L. Norrbom. Paratypes: Same data as holotype, 1♀ (USNM USNMENT00052304); same, except emerged 2 Jun 1992, 1♂ (IEXV USNMENT00052302).

Etymology. The name of this species is derived from that of its only known host plant.

Biology. We reared the three type specimens of this species from fruits of *Cyclanthera dissecta* Arn. in central Mexico (Figs. 204–205). The larvae fed extensively on the developing seeds and other tissues within the fruits. They pupated and then apparently entered a diapause as the adults did not emerge (under laboratory conditions) until 8–11 months after collection of the larvae.

***Blepharoneura femoralis* Wulp**

Figs. 27–29, 84, 100–101, 106, 113, 138–142, 176–180, 188–190, 194, 197–197

Blepharoneura femoralis Wulp 1899: 411 [in key], 412 [description]; Hendel 1914: 20 [in key], 21 [in catalog]; Aczél 1950: 196 [in catalog]; Foote 1965: 241 [type data and lectotype designation]; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 106 [in catalog].

Diagnosis. This species and *B. cyclantherae*, *zumbadoi*, *biseriata*, *osmundsonae*, and *nigrifemur* comprise the *femoralis* complex. They differ from other species of *Blepharoneura* in having the thoracic pleuron largely brown (or at least with a large brown spot medially on the anepisternum), the apical fourth or more of the hind femur entirely dark brown, and the distal part of the wing with marginal hyaline spots in cells r_{2+3} and r_{4+5}. Species of the complex are difficult to distinguish except by aculeus shape. That of *B. femoralis* has large, nearly right angle or acute lobes separated by deeper gaps than in other species of the complex. The lobed part is relatively short (no more than half as long as wide) and the medial lobe is convex.

Description. Head (Fig. 84): Dark brown area on ocellar tubercle extended more than half distance to postocellar seta or well beyond it, sometimes with small medial spot ventral to postocular seta (usually not extended beyond seta in Mexican specimens (22 of 29), but usually extended beyond it or with spot in South American specimens (26 of 30)). Medial vertical seta in yellow area. Medial occipital sclerite with pair of red brown to dark brown submedial vittae on ventral half, sometimes connected. Occipital suture narrowly dark brown, on lateral side bordered by variably shaped brown area [orange in 4 San Cristobal specimens], extending as band or triangular mark towards postocular setae, sometimes reaching eye margin, with lateral vertical seta in small spot or large yellow area except in some Peruvian and many Brazilian specimens (in Mexican specimens, yellow mark tends to extend ventrally along occipital suture and often along eye margin and postocular setae; in South American specimens it usually extends along the postocular setae).

Thorax (Fig. 100–101, 106): Scutum rarely (Mexico: L. Zempoala ♂) entirely microtrichose, usually nonmicrotrichose at least anteromedially, on posterior part of presutural sublateral vitta, and anterior half of postsutural sublateral vitta, or occasionally mostly nonmicrotrichose (except posterior to dorsocentral seta and laterally); scutum also with 2 pairs of dark brown vittae or rows of spots; submedial vitta strongly narrowed (6 of 29 Mexican, 3 of 4 Peruvian, 1 Bolivian, and 16 of 28 Brazilian specimens) or interrupted posterior to transverse suture and usually separated from mark on posterior margin (connected only in 1 Peruvian, 1 Bolivian, and 3 Brazilian specimens); sublateral vitta interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially or rarely with 2 separate marks. Notopleuron rarely (several Chiapas specimens) with medial and posterior brown spots, usually brown on lateral margin to entirely brown, often (especially in South American specimens) brown except for small pale area surrounding posterior seta. Small brown spot anterior to postsutural supra-alar seta often faint, rarely absent. Brown vitta or rarely pair of spots anterior to postalar seta, and brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of submedial brown marks or single somewhat inverted U-shaped medial mark usually extended to basal margin, or rarely with separate basal mark (3 marks total); side rarely (1 specimen [USNMENT00213756]) with faint brown spot near base. Subscutellum and mediotergite with pair of dark brown vittae, usually [except 6 San Cristobal specimens] ventral half of lateral margin of mediotergite also narrowly brown, sometimes connected to vittae, or both sclerites mostly brown (usually at least narrow medial vitta and dorsolateral corner of mediotergite yellow). Pleuron usually mostly dark brown, yellow only on propleuron, part or most of anepisternum (at least with large dorsomedial dark brown spot extending ventrally at least 1/3 distance to ventral margin, and narrowly in posteroventral corner, these areas connected in one Brazilian [USNMENT00213767], 1 Bolivian, and 2 Peruvian specimens [USNMENT00213960, -213952]), usually extreme anterior and/or posterior corners of katepisternum, all of katepimeron, greater ampulla, usually narrow dorsal margin and sometimes narrow posterior and ventral margins of anepimeron, and usually narrow dorsal margins of katatergite and anatergite expanding to larger spot posterodorsally on katatergite and anteriorly on anatergite (in 5 San Cristobal, Mexico specimens pleuron is more predominantly yellow, with large dorsomedial spot on anepisternum (extending 1/3 distance to ventral margin), large triangular medial spot on katepisternum, medial spot on anepimeron, large medial spot on meron, medial spot on katatergite, and posteroventral spot on katatergite and anatergite). Basalare brown. Dorsocentral seta aligned with or usually slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur occasionally with single ventral or separate anteroventral and posteroventral brown marks on apical 1/5–1/4. Hind femur with entire apical 1/5–1/3 dark brown, rarely (3 of 10 specimens from Mexico: San Cristobal, USNMENT00054205, -213780, -213783) with only ventral half of apex dark brown.

Wing (Figs. 27–29): Length 5.15–7.50 mm, width 2.55–3.66 mm, ratio 1.87–2.09. Crossvein r-m at 0.54–0.60 distance from bm-cu to dm-cu. Cell c with 2 broad rectangular hyaline spots, both reaching costa and subcosta, or occasionally with 1 large partially divided hyaline area (spots connected posteriorly); medial brown area almost as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, usually distinctly narrower than both hyaline spots, rarely as broad as 1 or both spots. Pterostigma

with large subapical hyaline spot [#3] reaching or rarely (4 specimens) almost reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–2 and 0–2 pale brown or hyaline spots, respectively. Radial cells medially with 1 broad to very broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1, sometimes partially divided anteriorly and/or posteriorly by brown spot, or with 2 narrower hyaline marks; cell r_{2+3} with 2 hyaline spots or 1 extremely broad hyaline spot aligned with r_1 mark(s), proximal spot [#8] small to large, distal spot [#9] large and broad; cell r_{4+5} with small to large hyaline spot [#14] aligned with middle of r_1 mark(s), usually no more than half as wide as cell, rarely (Peru: San Andrés ♀) almost reaching vein M, and with medial hyaline spot [#15] near anterior end of dm-cu small; sometimes (7 of 26 Mexican, 2 of 5 Andean, 17 of 28 Brazilian specimens) with small to minute anterior hyaline spot [#48] near midlength usually not touching vein R_{4+5}, rarely (some Brazilian and Peruvian specimens) with 2 spots in this area. Distally cell r_1 with 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 large marginal hyaline marks [#10, #11], proximal mark sometimes constricted medially or divided into marginal and posterior spots. Cell r_{4+5} with hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3}, rarely (6 specimens) with second more proximal spot; with 1–2 ovoid hyaline spots posteriorly, aligned with or between marks in cell m; and with 2 small ovoid or 1 large usually bilobed marginal or submarginal hyaline spots [#18, #18A]. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 2 large marginal hyaline spots [#27, #29] or rarely (3 Mexican specimens) with third small spot [#28] between them, and 1 or rarely (2 Peruvian and 2 Brazilian specimens) 2 anteromedial spots [#26A, #26], often connected, especially anteromedial and proximal marginal spots, more frequently in non-Brazilian specimens. Cell br usually with subbasal hyaline spot [#12] (absent in 1 Brazilian and 1 wing of 1 Mexican specimen). Cell bm with subbasal and subapical circular hyaline spots [#19, #20] (18 Mesoamerican, 2 Andean specimens), with subapical spot [#20] only (9 Mexican, 3 Andean, 27 Brazilian specimens), or rarely with broad hyaline area [fused spots] (2 Mexican specimens) or no hyaline area (1 Brazilian specimen). Cell bcu with (10 of 29 Mesoamerican, 3 of 5 Andean, 11 of 28 Brazilian specimens) or without hyaline spot in lobe. Posteromedial part of wing with large hyaline spots or marks or broad hyaline area; cell br with subapical hyaline spot [#13] and usually with smaller, more proximal spot [#44]; cell dm medially with 2–3 hyaline spots, 1 subbasal [fused #51, #52], crossing or nearly crossing cell and aligned with more proximal spot [#44] in cell br and proximal hyaline spot or part of mark in cell cu_1, 1 anteromedial [#21], usually connected or fused with subbasal mark [latter possibly also including #22 when broad posteriorly], and 1 posteromedial [#24 or fused #23 and #24]), often connected or fused with proximal hyaline area (more commonly in Mesoamerican specimens), when all spots fused resulting large hyaline area tapered distally, extending farther posteriorly than anteriorly; cell cu_1 medially with anteriorly bilobed or trilobed and posteriorly 1–2 lobed mark or with more broadly fused area with 0–2 anterior and 1 marginal brown spots [fused #31, #32, #33, #34, #36, #39], proximal anterior spot [#31] and/or marginal mark [#34, #39] across apex of vein A_1+Cu_2 sometimes isolated, especially in Brazilian specimens; subapical marginal hyaline spot [#37] usually reaching vein Cu_1. Cell dm usually with anteromedial subapical hyaline spot [#25], rarely absent (1 Brazilian specimen) or more anterior, touching vein M (1 Brazilian, 2 Peruvian specimens), sometimes (12 Mesoamerican, 1 Peruvian, 4 Brazilian specimens) connected to proximal hyaline area; sometimes (6 Mesoamerican, 2 Peruvian, 11 Brazilian specimens on at least 1 wing) with posterior subapical hyaline spot [#53] aligned with subapical hyaline mark in cell cu_1 or with more proximal spot.

Abdomen (Fig. 113): Syntergite 1+2 occasionally with pair of isolated submedial brown spots, but usually with spots connected or fused with pair of irregular posterolateral brown marks formed from fused sublateral spots and posterolateral bands. Tergites 3–5 rarely (some Mexican specimens) with 2 pairs of isolated brown spots, anterolateral brown spots, and L-shaped bands or 2 pairs of posterolateral spots, but usually all of these connected to form pair of irregular somewhat W-shaped lateral brown markings, separated medially; anterolateral spots often and submedial spots occasionally isolated.

Female terminalia: Oviscape entirely dark brown; length 0.78–1.00 mm. Aculeus (Figs. 138–142, 176–180) 0.57–0.70 mm long, 1.63–2.10 times as long as wide, with acute scales dorsally and ventrally on

membrane medially; tip angular laterally, short to moderately elongate triangular (lobed part 0.29–0.50 times as long as wide), with small, convex medial lobe and 3 pairs of step-like lobes separated by relatively deep gaps; sublateral lobe larger than submedial lobe; lateral gap 0.63–1.36 times as long as wide. Spermathecae subspherical, with straight to moderately convoluted, slender sclerotized neck and large cylindrical basal apodeme (Figs. 188–190).

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta on short lobe (Figs. 196–197).

Distribution. Mexico (Chiapas, Distrito Federal, Guerrero, Morelos, Oaxaca, Veracruz), Guatemala, Peru, Bolivia, southern Brazil (Rio de Janeiro, São Paulo, Paraná, Santa Catarina). The elevations of the collection sites in Mexico and the Andean countries, where provided by the collectors, are greater than 1000 m and usually greater than 2000 m. They are lower for the one southern Brazilian site for which the elevation was indicated (Nova Teutonia, 300–500 m).

Type data. Lectotype ♀ (designated by Foote 1965: 241) (BMNH), MEXICO: Guerrero: Omilteme [17°30'N 99°40'W], 8000 ft. [2439 m], Jul, H. H. Smith [examined]. The lectotype bears a label with "to be made lectotype RHF" in Foote's writing. We added a lectotype label.

Other specimens examined. BOLIVIA: La Paz: 8 km S of Chulumani, Apa Apa Reserve, 16°22'S 67°30.4'W, 1950–2100 m, 10 Mar 2001, S. D. Gaimari, 1♀ (USNM USNMENT00056460). BRAZIL: Paraná: Curitiba, 28 Jan 1965, Centro de Dipterologia, 1♀ (UFPC USNMENT00213830). Rio de Janeiro: Itatiaia, Maromba, [no date], Barretto, 2♂ (MZUSP). Santa Catarina: Nova Teutonia, 27°11'S 52°23'W, 300–500 m, 29 Jul 1936, F. Plaumann, 1♂ (BMNH USNMENT00052308); same, 7 Jan 1937, 1♂ (BMNH USNMENT00052329); same, 30 Jan 1937, 1♂ (HNHM USNMENT00213757); same, 30 Nov 1937, 4♂3♀ (BMNH USNMENT00052309–14, USNMENT00213665), 1♂1♀ (FSCA USNMENT00052333–34); same, 1 Dec 1937, 1♂ (HNHM USNMENT00213758); same, 15 Dec 1937, 1♂ (BMNH USNMENT00052330); same, 24 Mar 1938, 1♀ (BMNH USNMENT00052321); same, 9 Sep 1938, 2♀ (BMNH USNMENT00052322–23); same, 5 Oct 1938, 1♀ (BMNH USNMENT00052325); same, 11 Nov 1938, 1♂ (BMNH USNMENT00052332); same, 18 Nov 1938, 2♂1♀ (BMNH USNMENT00052315–17), 2♂2♀ (USNM USNMENT00052307, USNMENT00052318–20); same, 24 Nov 1938, 1♀ (USNM USNMENT00052306), 1♀ (BMNH USNMENT00052324); same, 25 Nov 1938, 3♀ (BMNH USNMENT00052326–28, USNMENT00213753); same, 15 Nov 1951, 1♂ (BMNH USNMENT00052331); same, 24 Aug 1961, 1♂ (CNC USNMENT00213765); same, Oct 1964, 1♂ (CNC USNMENT00213763) 1♀ (USNM USNMENT00213764); same, Apr 1966, 1♀ (CNC USNMENT00213766); same, Oct 1966, 1♀ (CNC USNMENT00213767); same, Nov 1966, 1♀ (CNC USNMENT00213762); same, Aug 1967, 1♂1♀ (MZUSP USNMENT00052336–37); same, Sep 1967, 1♀ (MZUSP USNMENT00052335); same, Oct 1968, 1♀ (MZUSP USNMENT00213760); same, 1 Oct 1971, 1♂ (MZUSP USNMENT00213755) 1♀(USNM USNMENT00213761); same, Nov 1971, 1♂ (MZUSP USNMENT00213756); same, Jan 1976, 1♂ (MZUSP USNMENT00213754); same, Aug 1977, 1♀ (FMNH USNMENT00213833). São Paulo: Cantareira Chapadão, Sep 1946, Barretto, 1♀ (MZUSP USNMENT00213759). GUATEMALA: Alta Verapaz: Coban, 22 May 1926, J. M. Aldrich, 1♀ (USNM USNMENT00213771). MEXICO: Chiapas: 49 km S of Jaltenango, [Parque Natural] El Triunfo, [15°40'N 92°48'W], 1300–2000 m, 13–15 May 1985, A. Freidberg, 2♀ (TAUI USNMENT00054206, USNMENT00213768) 2♀ (USNM USNMENT00213769–70); San Cristobal de Las Casas, 7200 ft. [2195 m], 29 May 1969, W. R. Mason, 3♀ (CNC USNMENT00054205, USNMENT00213782, USNMENT00213784) 1♀ (USNM USNMENT00213783); same, 27 Jun 1969, 1♂ (CNC USNMENT00213780); same locality, Malaise trap, 1 Jun 1969, 1♀ (USNM USNMENT00054204) 1♀ (CNC USNMENT00213790); San Cristobal de Las Casas, 10 mi NE of, 7500 ft. [2287 m], 22 May 1969, H. J. Teskey, 1♀ (CNC USNMENT00213781); San Cristobal de Las Casas, 3 mi N of, 7000 ft. [2134 m], 29 May 1969, H. J. Teskey, 1♂1♀ (CNC USNMENT00213785–86). Distrito Federal: Camino de Camarones, 6 Sep 1937, W. E. Stone, 4♀ (USNM USNMENT00213774–77); Mexico City, 16 Aug 1956, R. & K. Dreisbach, 1♀ (USNM USNMENT00213773). Guerrero: Omilteme, 8000 ft., Jul, H. H. Smith, 2♂ paralectotypes (BMNH), 1♀ paralectotype (MCZ USNMENT00213568). Morelos: Lagunas de Zempoala, 9400 ft. [2866 m], 22 Aug

1969, G. W. Byers, 1♀ (UKaL USNMENT00213772); Lagunas de Zempoala, 10–11 Aug 1989, A. L. Norrbom, 1♂ (USNM USNMENT00052305). Oaxaca: Río Molinos, 2620 m, 17 Jun 1982, J. Butze, 1♀ (IEXV USNMENT00213778). Veracruz: Ciudad Mendoza, 27 km W of, 13 Aug 1987, Brown & Powell, 1♀ (UCB USNMENT00213828); Xalapa, 1–6 Aug 1961, R. & K. Dreisbach, 1♀ (MSUL USNMENT00213787); same, 28 Sep - 3 Oct 1961, 1♀ (MSUL USNMENT00213789) 1♀ (USNM USNMENT00213788). PERU: Cajamarca, 1 km SE of town, 8000 ft. [2439 m], fertile valley in Andes, shrubs on arid hillside, P. S. & H. L. Broomfield, 1♀ (BMNH USNMENT00213951); Chanchamayo, 25 Jul 1960, Salazar & Ramirez, 1♀ (USNM USNMENT00213960); San Andrés, 20 km NE of Cuterra, 18 Jun 1956, W. Weyrauch, 1♀ (IML USNMENT00213803); Cusco: Machu Pichin, 21 Dec 1983, L. Huggert, 1♀ (ZIL USNMENT00213952). VENEZUELA: Distrito Federal: Los Venados, Serrania El Avila, 12 Dec 1958, M. Gelbez, 1♂ (IZAM).

Remarks. The populations recognized here as one widespread species may comprise several cryptic species. The Mesoamerican populations appear to be isolated from those in South America.

***Blepharoneura fernandezi* Norrbom & Condon, new species**
Figs. 30–31, 156

Diagnosis. This species can be distinguished from other species of *Blepharoneura* by the following combination of characters: Anepisternum and scutellum entirely yellow; scutum usually with pair of brown submedial presutural vittae, but without sublateral vittae or brown mark on posterior margin; cell r_1 proximally with single relatively narrow, tapering marginal hyaline mark; cell r_{2+3} with 2 marginal hyaline marks, posterior one not connected to marginal hyaline spot in cell r_{4+5}; cell r_{4+5} with single posterior marginal hyaline spot. It is very similar to a probably undescribed species (see sp. nr. *thetis*), which has a large brown mark on the posterior margin of the scutum and brown vittae on the mediotergite, and *B. thetis*, which differs in having brown scutellar markings and 2 marginal hyaline spots or a bilobed spot in cell r_{4+5}. The aculeus tip has a very broad, deep medial concavity and is most similar to those of *B. brevivittata* and *bivittata*.

Description. Head: Dark brown area on ocellar tubercle extended slightly to distinctly more than half distance to postocellar seta. Small red brown spot often (3 of 5 specimens) present surrounding and mostly posteromesal to medial vertical seta. Occipital suture narrowly dark orange to orange brown.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, entirely yellow or usually (4 of 5 specimens) with pair of orange brown to dark brown submedial, presutural vittae, not extended beyond transverse suture; posterior margin without brown marks. Scutellum, subscutellum and mediotergite entirely yellow. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned with or slightly posterior to postalar seta.

Legs: Entirely yellow.

Wing (Figs. 30–31): Length 5.40–6.00 mm, width 2.80–3.10 mm, ratio 1.89–2.00. Crossvein r-m at 0.50–0.55 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area distinctly paler than area of cell r_1 posterior to pterostigma, sometimes fainter anteriorly, and slightly to distinctly narrower than hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots or only with spot in r_1 posterior to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark in cell r_1 [#5] and usually with aligned spots in r_{2+3} and r_{4+5}, but rarely forming continuous acute triangular to nipple-shaped mark; spot in r_{2+3} [#8] usually narrowed anteriorly or not extending to R_{2+3} or absent; aligned spot in r_{4+5} [#14] touching R_{4+5} but extended less than halfway across cell, occasionally absent; cell r_{2+3} with more distal moderately large hyaline spot [#9], touching R_{4+5} and touching or almost touching R_{2+3}; cell r_{4+5} with medial hyaline spot [#15] near dm-cu small. Distally cell r_1 with 1 marginal subapical hyaline spot [#6], or on 1 wing of 1 specimen with only posterior hyaline spot. Cell r_{2+3} with 2 elongate marginal hyaline marks [#10, 11], both extending to vein R_{4+5}. Cell r_{4+5} with small hyaline spot [#16] on anterior margin aligned between

marginal marks in cell r_{2+3}, and with 1 slightly elongate to very broad marginal hyaline spot posteriorly [#18], usually touching apex of vein M. Cell m with 2 marginal [#27, 29] and 1 anteromedial [fused #26, #26A] hyaline spots or with proximal and anteromedial spots [#26A, #26 and #27] fused to form band, distal or both marks occasionally reaching vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular hyaline subbasal and subapical spots [#19, #20] or with 1 broad ovoid spot medially. Posteromedial part of wing with large hyaline spots, sometimes partially fused into larger marks; cell br with moderately large subapical hyaline spot [#13], occasionally (Brazilian ♀) with more proximal posterior hyaline spot [#44]; cell dm with subbasal elongate hyaline mark across cell [fused #51, #52], aligned with more proximal spot in cell br [#44] and/or proximal spot [#31] in cell cu_1 (if those present), usually connected to more distal markings (except on 1 wing of Brazilian ♀), distal mark [fused #21, #22, #23, #24] of fused or nearly fused spots L-shaped or subtriangular, proximal part aligned with subapical spot in cell br [#13], broader posterior part aligned with Y-shaped medial mark in cell cu_1; cell cu_1 sometimes (Brazilian ♀ and 1 Venezuelan ♀) with small proximal anterior hyaline spot [#31], with broad Y-shaped or vase-shaped hyaline mark [fused #32, #33, #36], and with mark across apex of vein A_1+Cu_2 [fused #34, #39]; subapical marginal hyaline mark [#37] small to large. Cell dm with subapical hyaline spot [#25] relatively large.

Abdomen: Mostly yellow. Tergites 3–5 with pair of rows of moderate brown submedial spots, spots usually narrow and L-shaped, or with 1–2 narrow anterior and 1 transverse posterior spots; spots not extending to lateral margins of tergites and separated medially by broad, tapering, straight margined yellow area; lateral margins of tergites without brown markings.

Female terminalia: Oviscape entirely dark brown; length 0.80–1.00 mm. Aculeus (Fig. 156) 0.72–0.74 mm long, 1.76–1.85 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short and broad (lobed part 0.19–0.23 times as long as wide), with broad, moderately deep medial apical concavity (as deep as length of medial lobes and more than half as broad as distance between apices of submedial lobes) and with 4 pairs of moderately large lobes separated by deep gaps; lateral lobe slightly projecting, broad and blunt, with a few minute apical serrations; sublateral and medial lobes narrower and more acute; submedial lobe smaller and more step-like. Spermathecae subspherical, neck with short, straight, weakly sclerotized basal part, abruptly expanded to very stout, cylindrical, sclerotized part, and with large stout cylindrical basal apodeme.

Distribution. Brazil (Pará), Venezuela (Aragua, Miranda).

Type data. Holotype ♀ (IZAM USNMENT00213884), VENEZUELA: Miranda: Guaracarumbo, 27 Nov 1951, F. Fernandez Y. Paratypes: BRAZIL: Pará: Santarém, 1♀ (CMP USNMENT00213888). VENEZUELA: Aragua: El Limón, 450 m, 10 Nov 1950, F. Fernández Yepez, 1♀ (USNM USNMENT00213886); same, 15 Dec 1955, C. J. Rosales, 1♀ (IZAM USNMENT00213887). Miranda: Cumbre Roja, 16 Oct 1950, J. R. Labrador, 1♀ (IZAM USNMENT00213885).

Etymology. The name of this species is a noun in the genitive case honoring the late Francisco Fernández Yepez, professor at the Universidad Central de Venezuela, Maracay, and an avid collector of insects who collected part of the type series.

Blepharoneura furcifer Hendel

Figs. 32–33, 90–91, 122, 157–158, 193

Blepharoneura furcifer Hendel 1914: 20 [in key], 23 [description]; Hering 1941: 133 [Peru, in key]; Aczél 1950: 196 [in catalog]; Foote 1967: 18 [in catalog]; Hardy 1968: 110 [type data]; Norrbom *et al.* 1999: 106 [in catalog].

Diagnosis. This species, *B. ruptafascia*, *septemdigitata*, an undescribed species (see *B.* sp. nr. *furcifer*) and some specimens of *B. quadristriata* and *macwilliamsae* differ from other *Blepharoneura* species in having two marginal hyaline marks in cell r_{2+3}, the more distal of which forms a concave band ending on the posteroapical margin of cell r_{4+5}. *B. furcifer* differs from the undescribed species in having the proximal

marginal hyaline spot in cell r_{2+3} extended into cell r_{4+5}; cell dm with two hyaline marks in basal 2/3; cell cu_1 with medial hyaline mark Y-shaped; and the medial surstylus with the prensisetae closely approximated. It differs from *B. macwilliamsae*, *ruptafascia*, and *quadristriata* in having either three or no anterior brown spots or vittae on the scutum (there are 2 or 4 in the other species) and from the latter two species in having yellow spots within the brown abdominal markings. It differs from *B. septemdigitata* in the markings of cell c (see key), but is most reliably distinguished from it by aculeus shape. The aculeus in *B. furcifer* is similar to those of *B. rupta* and *cornelli*, with minutely serrate, digitate lateral and broad slanted sublateral lobes, a step-like submedial lobe, and unpaired truncate or convex medial lobe. The aculeus of *B. septemdigitata* has similar lateral and sublateral lobes, but the submedial and medial lobes are digitate and separated by deep gaps.

Description. Head: Dark brown area on ocellar tubercle usually extended more than half distance to postocellar seta or reaching it, sometimes faintly. Medial vertical seta in small ovoid brown spot mostly posteromesal to seta or in narrow band extended to opposite seta and usually connected to brown area on ocellar tubercle. Medial occipital sclerite with (2 of 8 specimens) or without pair of brown submedial vittae on ventral half. Occipital suture narrowly dark orange to red brown.

Thorax (Fig. 90–91): Scutum nonmicrotrichose except anterolaterally, laterally, and posterior to dorsocentral seta, entirely orange or usually (6 of 9 specimens) with unpaired presutural medial red brown vitta, extended midway to or reaching transverse suture, and (5 of 9 specimens) presutural pair of red brown spots or short vittae aligned with medial corner of postpronotal lobe but not reaching it; sometimes (4 of 7 specimens) with uninterrupted narrow brown band near posterior margin. Scutellum, subscutellum, mediotergite and pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned posterior to postalar seta, closer to or aligned with intra-alar seta.

Legs: Entirely yellow.

Wing (Fig. 32–33): Length 5.90–6.73 mm, width 3.00–3.45 mm, ratio 1.90–1.97. Crossvein r-m at 0.49–0.51 distance from bm-cu to dm-cu. Cell c with 2 rectangular to ovoid hyaline spots, basal spot sometimes narrowly separated from costa or rarely from subcosta by pale brown area, distal spot reaching costa and subcosta; medial brown area as dark or almost as dark as area of cell r_1 posterior to pterostigma, usually with medial, streak-like pale brown area, dark brown medial area broader than basal hyaline spot, as broad or broader than distal spot. Pterostigma with subapical hyaline spot [#3], variable in size, minute to large and reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots (Bolivian ♂♂) or usually only with spot in r_1 posterior and slightly distal to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and usually with aligned spots in r_{2+3} [#8] and r_{4+5} [#14], usually forming acute triangular to nipple-shaped mark; spot in r_{2+3} rarely absent (Bolivian ♂♂) or sometimes not extending to R_{2+3} or R_{4+5} (3 specimens) leaving small aligned spot [#14] in r_{4+5} isolated; spot in r_{4+5} [#14] usually touching R_{4+5} but extended at most one third across cell; cell r_{2+3} often (5 of 7 specimens) with slightly more distal, small hyaline spot [#9], sometimes touching R_{2+3} or R_{4+5}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small. Distally cell r_1 with 1 subapical marginal hyaline spot [#6], rarely (1 wing of Colombian ♂) minute and indistinct, pale brown, occasionally (Colombian ♂, 1 wing of paralectotype) with additional small posterior hyaline spot. Cell r_{2+3} with 2 elongate marginal hyaline marks, proximal mark [#10] aligned with mark in cell r_{4+5} forming band extending at least to middle of r_{4+5}, sometimes connected to proximal mark in cell m, distal mark [#11] aligned with mark in r_{4+5} [including #18] forming concave band extending to posteroapical margin of r_{4+5}. Cell m usually with 2 marginal hyaline marks, proximal mark rarely (Leticia ♂) divided into 2 (marginal [#27] and anteromedial [fused #26, #26A]) spots, distal mark [#29] not extending into cell r_{4+5}. Cell br with subbasal hyaline spot [#12]. Cell bm without subbasal spot [#19], with small to large medial or subapical spot [#20]. Posteromedial part of wing with more proximal elongate hyaline band or series of 2–3 aligned spots and more distalY-shaped hyaline mark in cell cu_1 and aligned spot in cell dm; cell br with subapical hyaline spot [#13] usually reaching posterior margin and often anterior margin; cell dm with

usually slightly broader hyaline band [fused #21, #22], sometimes interrupted anteriorly along vein M (3 specimens) and occasionally (1 specimen) also posteriorly in cell dm, aligned with subapical spot [#13] in cell br and usually with or partially with proximal anterior spot in cell cu_1 [#31?] if latter present, posteromedially with ovoid hyaline spot [#23 and/or #24], occasionally (Venezuela ♂, 1 wing of Guyana ♀) connected to proximal band, aligned with Y-shaped mark in cell cu_1 (variously aligned with middle of mark, or with proximal branch and middle, or distal branch and middle of Y-shaped mark) isolating or nearly isolating brown mark anteriorly in cell cu_1; cell cu_1 with large marginal hyaline mark across apex of vein A_1+Cu_2 [fused #34, #39] isolated, with small anterior proximal hyaline spot [#31?] aligned with or slightly proximal to proximal band in cell dm, and with large Y-shaped hyaline mark [fused #32?, #33, #36], proximal branch of fork aligned distal to proximal marginal mark in cell cu_1 [#34, #39] and proximal mark in cell dm; subapical marginal hyaline mark [#37] moderate to large. Cell dm with subapical spot [#25] small and hyaline (1 specimen) or usually faint, pale brown, or absent.

Abdomen (Fig. 122): All tergites with pair of broad irregular dark brown markings; mark on each tergite extended along posterior margin to lateral margin of tergite; markings on tergites 3–5 bi- or trimodal or with 1–2 small to large anterior yellow spots within them; markings broadly separated medially by slightly tapering, nearly straight margined yellow area.

Female terminalia: Oviscape entirely dark brown; length 1.00–1.10 mm. Aculeus (Fig. 157–158) 0.88 mm long, 1.83–2.00 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip slightly flared outward basolaterally, short triangular (lobed part 0.38–0.39 times as long as wide), with short broad truncate or convex medial lobe and 3 pairs of lobes; lateral lobe large and digitiform, with minute serrations apically; sublateral lobe very broad and slanted, minutely serrate; submedial lobe small and step-like. Spermathecae subspherical, with strongly convoluted, broad sclerotized neck and with or without small cylindrical basal apodeme (Fig. 193).

Male terminalia: Medial surstylus long and slender, prensisetae subequal, closely approximated, separated by less than width of medial prensiseta.

Distribution. Low to middle elevation areas of Venezuela (Monagas), Guyana, eastern Colombia, Ecuador, Peru, and Bolivia, and southern Brazil (São Paulo).

Type data. Lectotype ♀ (NMW) [here designated to stabilize the usage of this name], PERU: Pachitea-Münd. [mouth of Río Pachitea], 150 m, 24 Nov 1903, [C. A. W. Schnuse]. Paralectotype ♂ (SMT USNMENT00213926), BOLIVIA: La Paz: Mapiri [area], San Carlos, 800 m, Apr 1903, [C. A. W. Schnuse]. Both type specimens were examined. Each has a determination label with "Blepharoneura furcifer" in Hendel's writing. The male also has a red Typus label with "Blepharoneura furcifer Hendel" in his writing, and the lectotype has a red “Cotype ♀” label and a label with “Cotype ♀ Marked by D. E. Hardy—1961”, both added by Hardy. The lectotype is lacking its right wing, but otherwise is in good condition. Its mesonotum is entirely orange.

Other specimens examined. BOLIVIA: La Paz: Mapiri, Arroyo Tuhiri, 15°17'26"S 68°15'46"W, 508 m, Malaise trap, 9–13 Apr 2004, S. D. Gaimari & M. Hauser, 1♂ (CDFA USNMENT00212451). BRAZIL: São Paulo: Araçatuba, Corrego Azul, Feb 1946, Barretto, 1♂ (MZUSP USNMENT00213923). COLOMBIA: Amazonas: Leticia, 20–26 Feb 1972, A. Sauvé, 1♂ (CNC USNMENT00213924). ECUADOR: Napo: Limoncocha, Rio Napo, 300 m, Malaise trap, 28 Dec 1973, B. Drummond, 1♀ (FSCA USNMENT00213928). GUYANA: [unspecified locality], 1908, K. S. Wise, 1♀ (BMNH USNMENT00213925). PERU: Madre de Dios: Avispas, 20–30 Sep 1962, L. Peña, 1♀ (USNM USNMENT00053665). VENEZUELA: Monagas: Caripito, 4 May 1942, 1♂ (AMNH USNMENT00213927).

Blepharoneura* species near *furcifer
Fig. 34

Diagnosis. This species, *B. furcifer*, *ruptafascia*, *septemdigitata*, and some specimens of *B. quadristriata* and *macwilliamsae* differ from other *Blepharoneura* species in having two marginal hyaline marks in cell r_{2+3}, the more distal of which forms a concave band ending on the posteroapical margin of cell r_{4+5}. It differs from *B. macwilliamsae*, *ruptafascia*, *quadristriata*, and some specimens of the other two species in lacking brown markings on the mesonotum. It differs from *B. furcifer* and *septemdigitata* as follows: cell r_1 without subapical hyaline spot [#6]; proximal marginal hyaline spot in cell r_{2+3} not extended into cell r_{4+5}; cell dm with only one hyaline mark in basal 2/3; cell cu_1 with medial hyaline mark not Y-shaped; and medial surstylus with prensisetae well separated. It also has a subapical hyaline spot [#25] in cell dm, whereas this spot is usually minute or absent in the other two species. The female is unknown.

Description. Head: Dark brown area on ocellar tubercle not extended towards postocellar seta. Medial occipital sclerite with pair of brown vittae on ventral half. Small dot-like brown spot anterolateral to medial vertical seta. Occipital suture narrowly red brown to dark brown.

Thorax: Entirely yellow. Basalare entirely yellow. Scutum entirely microtrichose. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Entirely yellow.

Wing (Fig. 34): Length 5.10–5.35 mm, width 2.65–2.87 mm, ratio 1.86–1.92. Crossvein r-m at 0.50–0.53 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline spots, basal spot very narrow, both reaching costa and subcosta; medial brown area as dark as area of cell r_1 posterior to pterostigma, much broader than both hyaline spots, in Panama male with very narrow, slightly paler, streak-like medial area. Pterostigma with large hyaline subapical spot [#3], sometimes reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots except for minute spot in r_1 posterior to apex of vein Sc. Radial cells medially with tapering acute triangular to nipple-shaped basal marginal hyaline mark [#5] in cell r_1. Cell r_{2+3} without hyaline spot aligned with r_1 mark, but with more distal hyaline spot [#9], touching R_{2+3} or R_{4+5} and more than half as wide as cell. Cell r_{4+5} with hyaline spot [#14] aligned with or slightly distal to r_1 mark, touching R_{4+5} and extending half or slightly more than halfway across cell; with medial hyaline spot [#15] near anterior end of dm-cu small. Distally cell r_1 without hyaline spots [#6]. Cell r_{2+3} with 2 elongate marginal hyaline marks, proximal mark [#10] ending at vein R_{4+5}, distal mark [#11] aligned with mark in cell r_{4+5} forming concave band extending to posteroapical margin of r_{4+5} [including #18]. Cell m usually with 2 elongate marginal hyaline marks, proximal band [fused #26A, #26 and #27] reaching vein M, distal band [#29] reaching or almost reaching (1 wing of both specimens) vein M; cell r_{4+5} without hyaline markings aligned with bands in cell m. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with 2 elongate hyaline marks or series of aligned spots; cell br with subapical hyaline spot [#13] reaching posterior margin; cell dm with subtriangular to L-shaped hyaline mark [fused #21, #22, #23, and possibly #24], broader posteriorly, its proximal margin aligned with subapical spot [#13] in br and with or almost with small proximal anterior spot in cell cu_1; cell cu_1 with isolated narrow marginal hyaline mark across apex of vein A_1+Cu_2 [fused #34, #39], with small proximal anterior hyaline spot [#31?] aligned with or slightly proximal to proximal part of mark in dm, and with medial band [fused #32?, #36] or (1 wing of Colombian ♂) anterior spot [#32?] and band reaching margin [#36], usually with proximal bend anteriorly, aligned slightly distal to mark in dm; subapical marginal hyaline mark [#37] moderate sized. Cell dm with subapical hyaline spot [#25] moderate sized.

Abdomen: Syntergite 1+2 with pair of small faint brown spots on posterior margin and small dark brown spot on posterolateral corner. Tergite 3 with 2 pairs of evenly spaced dark brown spots and L-shaped dark brown band on posterolateral margin. Tergites 4 and 5 with similar markings but on tergite 4 sublateral spot connected to posterolateral band, and on tergite 5 both spots fused with posterolateral band to form trilobed mark.

Male terminalia: Medial surstylus relatively short and broad, prensisetae subequal, not on lobes, separated by more than width of medial prensiseta.

Distribution. Lowland areas of Panama and Colombia.

Specimens examined. COLOMBIA: 70 km E of Buenaventura, Anchicayá, 400 m, 17–20 Feb 1970, D. M. Wood, 1♂ (CNC USNMENT00213929). PANAMA: Panamá: Barro Colorado National Monument, 20 Feb - 13 Mar 1985, D. A. Grimaldi, 1♂ (AMNH USNMENT00213930).

Remarks. The two males examined probably represent an undescribed species, but we are reluctant to formally name it until female specimens become available.

Blepharoneura hirsuta Bates

Figs. 35–37, 86, 92, 123, 153–154

Blepharoneura hirsuta Bates 1933: 48; Aczél 1950: 196 [in catalog]; Lima & Leite 1952: 309; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 106 [in catalog].

Blepharoneura amazonensis Lima & Leite 1952: 308; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 105 [in catalog]. **New synonymy.**

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: vertex with brown spot or band surrounding medial vertical seta; scutum without vittae or with 3 vittae or anterior spots, including unpaired medial one; anepisternum without brown markings; pterostigma without subapical hyaline spot; cell m with distal hyaline mark extended to or almost to vein R_{4+5}; and subapical hyaline band extended anteriorly at least to vein R_{2+3} and/or cell r_1 with aligned posterior spot. The aculeus is similar to that of *B. bidigitata* (which is dissimilar in external characters), with the digitate lateral lobe and acute sublateral lobe well separated from the medial and submedial lobes by a broad straight area.

Description. Head (Fig. 86): Dark brown area on ocellar tubercle usually extended to or beyond postocellar seta. Medial vertical seta in small ovoid dark brown spot mostly posteromesal to seta or in narrow band extended to opposite seta and usually connected to area on ocellar tubercle. Occipital suture narrowly dark orange to brown.

Thorax (Fig. 92): Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally; sometimes (2 of 6 specimens) entirely orange, in 3 specimens with unpaired presutural medial red brown vitta, in 1 specimen extended to posterior brown mark, and presutural pair of short red brown vittae aligned with medial corner of postpronotal lobe but not reaching it or transverse suture; posterior margin in 2 specimens with small triangular medial brown spot between acrostichal setae, in 2 others with 5–lobed dark brown mark. Scutellum entirely yellow (4 specimens, 2 teneral) or with pair of faint brown submedial spots (1 specimen) or with pair of transverse red brown marks (1 Rio de Janeiro ♂, USNMENT00213794) on disk; side occasionally (1 Rio de Janeiro ♂, USNMENT00213794) with 2 pairs of faint diffuse red brown spots, 1 bordering basal seta, 1 on ventral margin ventral to medial seta. Subscutellum, mediotergite and pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta or sometimes closer to level of intra-alar seta.

Legs: Entirely yellow.

Wing (Fig. 35–37): Length 5.75–6.95 mm, width 3.05–3.56 mm, ratio 1.89–2.01. Crossvein r-m at 0.51–0.57 distance from bm-cu to dm-cu. Cell c with 2 subrectangular or usually ovoid hyaline spots or (3 of 4 wings of Venezuelan specimens, *B. amazonensis* holotype) with 1 somewhat goggles-shaped or elongate area, hyaline area(s) reaching subcosta but not reaching costa except in Rio de Janeiro specimens, sometimes only half as wide as cell; brown area except along distal margin of cell paler than area of cell r_1 posterior to pterostigma, medial part variable in size compared to hyaline spots. Pterostigma without subapical hyaline

spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot in r_{2+3} [#8] forming acute triangular to nipple-shaped mark, extended at least one third across r_{2+3}; cell r_{4+5} with (4 of 6 specimens) or without small hyaline spot [#14] aligned with or slightly proximal or distal to level of r_1 mark, extended less than one third across cell, and with medial hyaline spot [#15] near anterior end of dm-cu usually absent, but small in holotype and moderate sized in Rio de Janeiro specimens. Distally cell r_1 without hyaline spots [#6] (1 specimen) or usually with only posterior hyaline spot or extension of band from r_{2+3}. Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending parallel to costa to vein R_{2+3} or slightly into r_1 (if fused with subapical r_1 spot), as broad as to much broader than marginal brown area. Cell m with 2 elongate marginal hyaline marks, proximal mark [fused #26A, #26 and #27] extending to or almost to vein M, sometimes (Venezuelan ♂, Amazonas ♀) narrowly connected to distal mark along vein M in r_{4+5}, distal mark [#29] extending to or almost to vein R_{4+5}. Cell br usually with subbasal hyaline spot [#12] (absent only in Guatopo, Venezuela ♀). Cell bm usually without circular subbasal hyaline spot [#19] (present only in Guyanan ♀), but with medial or subapical hyaline spot [#20]. Posteromedial part of wing with 2 elongate hyaline marks; proximal one [aligned and connected #13, #21, #22, #32, #34, #39] extending from cell br subapically, across cells dm and cu_1 subbasally (except in *B. amazonensis* holotype extending anteriorly only to middle of dm), and across apex of vein A_1+Cu_2; distal band [fused #24, #33, #36; also #25 or novel spot in Guatopo specimens] extending from middle of cell dm, or in Guatopo, Venezuela specimens from vein M, to posterior wing margin, sometimes connected or almost connected posteriorly in cell dm or (*B. amazonensis* holotype) anteriorly in cell cu_1; cell cu_1 with subapical marginal or submarginal hyaline spot [#37] usually small to moderate sized, not reaching vein Cu_1, occasionally absent. Cell dm without isolated subapical hyaline spot [#25] (possibly fused to distal band in Guatopo specimens).

Abdomen (Fig. 123): All tergites with pair of broad dark brown submedial vittae, mark on syntergite 1+2 sometimes isolated as spot (faint or absent in *amazonensis* holotype), marks on other tergites sometimes (Rio de Janeiro specimens, *amazonensis* holotype) U-shaped, with large medial yellow area, or fragmented into 2–3 spots; vittae with even margins, not extending to lateral margins of tergites and separated medially by broad, tapering, straight margined yellow area; tergites 3–5 usually with narrow brown mark on at least posterior half of lateral margin.

Female terminalia: Oviscape entirely dark brown; length 0.98–1.08 mm. Aculeus (Fig. 153–154) 0.86–0.92 mm long, 1.95–2.19 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip flared outward basolaterally, short (lobed part 0.17–0.21 times as long as wide), with small, convex or very weakly trilobed medial lobe and 3 pairs of lobes, lateral lobe large and digitiform, with minute serrations apically, sublateral lobe large and acute, submedial lobe very small, separated from sublateral lobe by broad transverse area (width of submedial and medial lobes together 0.24–0.25 distance between apices of sublateral lobes). Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta small, about half as wide as medial prensiseta.

Distribution. Lowland areas of Venezuela (Miranda, Yaracuy), Guyana, and Brazil (Amazonas, Rio de Janeiro).

Type data. *B. hirsuta*: Holotype ♀ (AMNH), VENEZUELA: Yaracuy: Aroa, [no date or collector], Bates slide No. 298, [examined]. *B. amazonensis*: Holotype ♂ (Instituto Ozwaldo Cruz, no. 5531, slide preparations 4771–2), BRAZIL: Amazonas: Rio Negro, São Gabriel [São Gabriel da Cachoeira], 3 Nov 1927, J. F. Zikan [not examined].

Other specimens examined. BRAZIL: Amazonas: Manaus, 1113 R.L.E., 3°06'48S 60°01'31W, 28 Nov 1985, B. Klein, 1♂ (INPA USNMENT00054198). Rio de Janeiro: Rio de Janeiro, "Dist. Federal", Jun 1938, Serviço Febre Amarela M. E. S. Bras., 2♀ (USNM USNMENT00054199, USNMENT00213794). GUYANA: Essequibo R., Moraballi Creek, at light, 3 Sep 1929, Oxford University Expedition, 1♀ (BMNH

USNMENT00213793). VENEZUELA: Miranda: Parque Nacional Guatopo, La Guzmanera, Fila La Raya, emerged 14 Feb 1980 reared ex stem of *Gurania acuminata* coll. 20 Jan 1980, M. A. Condon, 1♂ (IZAM USNMENT00213795); same locality, reared ex stem of *Gurania acuminata*, M. A. Condon, 1♀ (USNM USNMENT00213792).

Remarks. We were unable to examine the holotype of *B. amazonensis* Lima & Leite. The original description is brief, but excellent photos of the wing and abdomen were provided. Except for having the more proximal hyaline band on the posteromedial part of the wing shorter (the absence of a subapical hyaline spot or mark in cell br is particularly unusual), the holotype falls within the range of variation of the examined specimens. We therefore consider this name a synonym of *B. hirsuta*, a possibility considered by Lima & Leite (1952).

Biology. Two specimens were bred from larvae that mined shoots of *Gurania acuminata* Cogn. (Fig. 209) in the forest understory in Guatopo National Park, Venezuela (very humid premontane forest at approx. 600 m). Each larva tunneled through more than a meter of actively growing young shoots of the plant near ground level (Condon & Norrbom 1999).

Blepharoneura hyalinella Norrbom & Condon, new species

Figs. 38–39, 134

Diagnosis. This species resembles *B. amplihyalina*, *bipunctata*, *apaapa*, *multipunctata* and *nigriapex* in having a dark brown spot posterodorsally on the anepisternum, a single medial brown spot on the scutellum, and 3 hyaline marginal spots in cell m. It differs from *B. bipunctata* and *multipunctata* in having a single broad marginal hyaline mark basally in cell r_1. It differs from the other three species by the small size of the posteromedial hyaline area in cell dm. The aculeus tip is less elongate than in *B. amplihyalina* and *apaapa*, and differs from that of *B. nigriapex* in having the gap between the lateral and sublateral lobes wider than long.

Description. Head: Dark brown area on ocellar tubercle extended at least half distance to postocellar seta or reaching its level medially. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Postpronotal lobe mostly yellow, with small dark brown spot at junction with anepisternum, diffuse brown spot on posterolateral margin, and dorsal brown area connected to anterior end of sublateral scutal vitta. Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta narrowed or usually interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta interrupted at transverse suture, posterior part complete to or almost to level of intra-alar seta, separated from mark on posterior margin; posterior margin with 2 broad quadrate dark brown marks, usually narrowly separated but occasionally narrowly connected posteriorly. Notopleuron mostly brown except for small pale spot surrounding posterior seta. Small dark brown spot anterior to postsutural supra-alar seta, large dark brown spot lateral to postsutural supra-alar seta, large dark brown spot anterior to postalar seta, and large dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single small to moderate sized basomedial brown spot. Subscutellum and mediotergite with pair of moderately broad dark brown vittae, mediotergite also with lateral margin of at least ventral half narrowly brown. Pleuron mostly yellow. Anepisternum with dark brown spot dorsal to anterior seta. Anepimeron usually without medial brown spot (small and faint in 3 of 11 specimens). Anatergite with large dorsomedial dark brown mark, sometimes extended to posterior margin. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Anteroventral apical ridge of mid femur and/or anteroventral basal ridge of mid tibia dark brown. Anteroventral and posteroventral ridges of hind femur and/or anteroventral and posteroventral basal ridges of hind tibia dark brown.

Wing (Figs. 38–39): Length 7.40–8.00 mm, width 3.50–3.83 mm, ratio 2.02–2.11. Crossvein r-m at 0.55–0.58 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline to subhyaline

spots, both reaching costa and subcosta but fading to pale brown posteriorly or sometimes with narrow pale brown posterior margin; medial brown area paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, slightly broader than basal hyaline spot and usually as broad as to slightly broader than distal spot. Pterostigma with large hyaline to pale brown subapical spot [#3], usually reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 2–4 and 1–4 pale brown spots, respectively. Radial cells medially with 1 relatively narrow quadrate or usually inverted trapezoidal or subtriangular basal hyaline mark [#5] in cell r_1, often fading to pale brown posteriorly or occasionally (at least 1 wing on 5 specimens) with small brown spot partially dividing it on posterior margin; cell r_{2+3} with 2 hyaline to pale brown spots posterior to r_1 mark, basal spot [#8] sometimes slightly proximal or distal spot [#9] usually slightly more distal, distal spot often moderately broad but rarely extended more than halfway across cell, not reaching R_{4+5}; cell r_{4+5} usually with small pale brown spot [#14?] anteriorly or medially and aligned with r_1 mark, with small hyaline spot [#15] aligned with or slightly distal to dm-cu, and also with additional tiny pale brown spots, 1–3 on or near anterior margin and 1–2 on or near posterior margin. Distally cell r_1 with 2 or rarely 3 small marginal hyaline spots [#6 and additional spots], sometimes (at least 1 wing on 6 of 11 specimens) also with 1 small pale brown posterior spot. Cell r_{2+3} with 2 small to elongate marginal hyaline marks [#10, 11], both usually not extending to vein R_{4+5} (only proximal mark occasionally reaching it), proximal mark often divided into marginal spot and spot near R_{4+5} or short and not extending beyond midwidth of cell. Cell r_{4+5} usually with small hyaline spot [#16] anteriorly (absent in 1 specimen), aligned between apical marks in cell r_{2+3} or with more distal mark; with small posterior hyaline spot aligned with medial mark or spots in cell m; and with 1–2 small rounded marginal or subapical spots [#18, #18A], more anterior spot [#18A] often (6 of 11 specimens) absent or fused to posterior spot to form C-shaped mark. Cell m with small subbasal hyaline spot [#49] near midlength of dm-cu and sometimes (at least 1 wing of 5 of 11 specimens) with tiny additional spot near anterobasal corner; with small anteromedial spot [#26A], and 3 usually ovoid marginal (medial spot occasionally submarginal) hyaline spots [proximal #27, distal #29], medial spot [fused #26, #28] usually largest, occasionally (2 of 11 specimens) fused with anteromedial spot. Cell br with subbasal pale brown spot [#12]. Cell bm with circular subbasal and subapical hyaline or pale brown spots [#19, #20]. Cell bcu usually with small hyaline or pale brown spot in lobe (absent in 1 wing of 2 specimens), often extending anteriorly into cell cu_1 or that cell with similar nearby spot. Posteromedial part of wing with large hyaline marginal area; cell br subapically with hyaline spot [#13] and small to minute, much more proximal pale brown spot; cell dm with 1–3 small spots in basal half, usually pale brown, and larger ovoid posteromedial hyaline spot [#24 or fused #23, #24] (0.16–0.23 times as long as cell along vein Cu_1) much shorter than hyaline mark in cell cu_1 and aligned with its distal half; cell cu_1 with large hyaline area covering almost medial half [broad fusion of at least #32, #33, #34, #35?, #36, #36A], broad on posterior wing margin, with subbasal submarginal brown spot, 1 submarginal diffuse pale brown spot, and usually 1 anterior pale brown spot, the latter 2 occasionally narrowly connected to subbasal brown spot faintly dividing hyaline area; subapical marginal hyaline spot [#37] small to moderate sized, not reaching vein Cu_1. Cell dm with subapical hyaline spot [#25] minute (2 specimens) or usually absent, well separated from posteromedial spot [#24] when present, and with 1–2 anterior and 1 posterior small more distal spots, at least the posterior spot [#53] aligned or nearly aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow, with 4 rows of evenly spaced dark brown spots; tergites 3–5 usually also with anterolateral spot touching or almost touching lateral margin (absent on tergites 3 and 4 in 2 ♀); also with pair of spots or more commonly with them connected to form L-shaped band on posterior margin and posterolateral corner of all tergites, separated medially, on tergites 3–6 extending anteriorly on lateral margin, sometimes connected to anterolateral spot, but lateral margin always partially yellow at least on tergites 3 and 4; submedial spots occasionally connected to sublateral spots on syntergite 1+2, and some or all spots on other tergites occasionally connected to posterior bands or spots.

Female terminalia: Oviscape entirely dark brown; length 1.50–1.70 mm. Aculeus (Fig. 134) 1.06–1.08 mm long, 2.08–2.12 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.46–0.50 times as long as wide), with small, truncate medial lobe and 3 pairs of step-like lobes separated by relatively deep gaps; sublateral lobe much larger than submedial lobe; lateral gap 0.71–0.83 times as long as wide. Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and small cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta subequal to medial prensiseta.

Distribution. Bolivia. The type locality is a remnant of Yungas forest. The specimens were collected at 2000–2050 m elevation.

Type data. Holotype ♀ (ANCB USNMENT00055938), BOLIVIA: La Paz: near Chulumani, Apa Apa Reserve, upper trail in primary forest, 16°21'15S 67°30'20W, 2000 m, log site, cloudy AM or late afternoon, on undersides of leaves of undetermined Cucurbitaceae (01–Bol-01) or supporting understory plant Solanaceae sp. (01–Bol-03), 1–3 Apr 2001, A. L. Norrbom. Paratypes: Same data as holotype, 1♂ (ANCB USNMENT00055936) 1♂ (CDFA USNMENT00055927) 1♂ (TAUI USNMENT00055929) 3♂3♀ (USNM USNMENT00055928, USNMENT00055931, USNMENT00055933, USNMENT00055935, USNMENT00055939–40). BOLIVIA: La Paz: 8 km S of Chulumani, Apa Apa Reserve, 16°35.6'S 68°51.2'W [sic; correct coordinates 16°22'S 67°30.4'W], 2050 m, 10 Mar 2001, A. Freidberg, 1♀ (TAUI USNMENT00055054).

Etymology. The name of this species is an adjective referring to the relatively small size of the posteromedial hyaline area in cell dm.

Biology. The digestive tract of a dissected female (USNMENT00055054) was green, indicating that adults of this species rasp leaves or some other nonfloral part of its host plant.

Blepharoneura io Giglio-Tos
Fig. 40

Blepharoneura io Giglio-Tos 1893: 10; Giglio-Tos 1895: 57 [type data; additional description]; Hendel 1914: 21 [in key, in catalog]; Aczél 1950: 196 [in catalog]; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 105 [in catalog].

Diagnosis. This species differs from all other species of *Blepharoneura* by the hyaline marginal markings of cell r_1, which are subequal and nearly evenly spaced. Other useful diagnostic characters include: Scutum with 2 pairs of brown vittae; scutellum dorsally with inverted U-shaped brown mark (probably varies as a pair of separate spots); notopleuron and anepisternum without brown markings; cells r_{2+3} and r_{4+5} each with 2 separate marginal hyaline marks; and the latter without a posterior hyaline spot aligned with hyaline marks in cell m. The female is unknown.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Occipital suture narrowly red brown.

Thorax: Scutum entirely microtrichose (surface of holotype largely obscured by debris, but clean areas are microtrichose), with 2 pairs of dark brown vittae, both interrupted posterior to transverse suture and not connected to mark on posterior margin; posterior margin with 1 broad dark brown mark narrowed medially. Notopleuron and sides of scutum without brown markings except for faint brown spot lateral to dorsolateral corner of scutellum. Scutellum with single inverted U-shaped dark brown medial mark, extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned with postalar seta.

Legs: Entirely yellow.

Wing (Fig. 40): Length 4.65 mm, width 2.48 mm, ratio 1.92. Crossvein r-m at 0.58 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area almost as

dark as area of cell r_1 posterior to pterostigma, paler anteriorly, approximately as broad as both hyaline spots. Pterostigma with large hyaline subapical spot [#3], sometimes reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) only with diffuse spot in r_1 posterior and slightly distal to apex of vein Sc. Radial cells medially with 2 relatively narrow basal marginal hyaline marks in cell r_1, narrowly connected anteriorly, basal mark [#5] tapered and reaching vein R_{2+3}, distal mark reaching or almost reaching R_{2+3}; cell r_{2+3} with small hyaline spot [#8] aligned with basal mark in r_1 and broad spot [#9] aligned with second mark in r_1; cell r_{4+5} with small hyaline spot [#14] in anterior half of cell between r_1 marks, not reaching R_{4+5} and less than 1/4 width of cell, and with hyaline spot [#15] near anterior end of dm-cu moderate sized, slightly distal to dm-cu. Distally cell r_1 with 1 large marginal hyaline spot [#6], closer to second proximal marginal hyaline spot than to apex of vein R_1. Cell r_{2+3} with 2 elongate marginal hyaline marks [#10, 11], both extending to vein R_{4+5}. Cell r_{4+5} with 2 marginal hyaline marks, posterior one [fused #18 plus additional spot] elongate, proximally directed, anterior one [fused #16, 18A] similar and extended to level of distal mark in cell r_{2+3}, or (on right wing) divided into smaller, rounded subapical [#16] and marginal [#18A] spots. Cell m with 3 moderate sized hyaline spots, 2 marginal [#27, 29] and 1 anteromedial [fused #26, #26A], none extended to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with small circular subbasal and subapical spots [#19, #20]. Posteromedial part of wing with hyaline spots mostly isolated; cell br with subapical spot [#13]; cell dm with elongate subbasal mark [fused #51, #52] across cell, connected with anterior proximal spot in cell cu_1 [#31], with isolated anterior spot [#21] aligned slightly distal to or (right wing) aligned with and connected to subapical spot in br; dm also with broad spot posteromedially [fused #22, #23, #24]; cell cu_1 medially with 3 anterior and 2 marginal spots, proximal anterior spot [#31] aligned with proximal band in dm, medial and distal anterior spots [#32, #33] aligned with posteromedial spot in dm and narrowly separated from proximal marginal mark [fused #34, #39] across apex of vein A_1+Cu_2 and medial marginal mark [#36]; subapical marginal spot [#37] moderately large, almost reaching vein Cu_1. Cell dm with subapical hyaline spot [#25] moderate sized, not extended to vein M.

Abdomen: All tergites with pair of submedial dark brown spots, isolated except on tergite 5. Syntergite 1+2 with pair of posterolateral dark brown bands. Tergites 3–4 with paired irregular dark brown posterolateral marks, separated medially, formed by fused sublateral spot and posterolateral band, extending only slightly anteriorly on lateral margin. Tergite 5 with pair of isolated dark brown spots and with pair of posterolateral bands, narrowly connected to submedial spots.

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta on short lobe.

Distribution. Mexico (Veracruz). The type locality is at about 1200 m elevation.

Type data. Holotype ♂ (IMZ), MEXICO: Veracruz: Tuxpango [18°49'N 97°01'W], [1855–56?], Sumichr. [A. L. J. de Sumichrast] [examined]. The holotype has labels with "867", "101.", and, in Giglio-Tos' writing, "Blepharoneura Io Giglio-Tos ♂".

Blepharoneura isolata **Norrbom & Condon, new species**
Fig. 41

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: thoracic pleuron, scutellum and hind femur without brown markings; scutum with pair of broad brown marks on posterior margin and 2 pairs of brown vittae; and pterostigma with subapical hyaline spot. Another useful diagnostic character is that the proximal posterior hyaline spot in cell m is isolated from the posterior margin of the cell. The female is unknown.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Occipital suture narrowly orange brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of red brown to dark brown vittae; submedial vitta narrowed slightly posterior to transverse suture but extended to level of dorsocentral seta, not connected to marks on posterior margin; sublateral vitta interrupted at transverse suture, postsutural part complete but separated from marks on posterior margin; posterior margin with 2 large triangular dark brown marks. Notopleuron without brown markings. Small brown spot anterior to postsutural supra-alar seta, another anterior to postalar seta, and brown spot lateral to dorsolateral corner of scutellum present. Scutellum entirely yellow. Subscutellum and mediotergite with pair of moderately broad brown vittae. Pleuron entirely yellow. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Entirely yellow.

Wing (Fig. 41): Length 7.13 mm, width 3.56 mm, ratio 2.00. Crossvein r-m at 0.47 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area distinctly paler than area of cell r_1 posterior to pterostigma, as broad as basal hyaline spot, narrower than distal spot. Pterostigma with large subapical pale brown spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) each with 2 hyaline spots, 1 posterior to apex of vein Sc and 1 more distally. Radial cells medially with relatively narrow quadrate basal marginal hyaline mark [#5] in cell r_1 and nearly aligned spots in r_{2+3} [#8] and r_{4+5} [#14], that in r_{2+3} broad and slightly proximally offset, extended to R_{4+5}; spot in cell r_{4+5} [#14] aligned with r_1 mark, small, extended less than halfway across cell, barely touching R_{4+5}; cell r_{2+3} with second, more distal, broad hyaline spot [#9], touching R_{2+3} but not reaching R_{4+5}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu moderate sized. Distally cell r_1 without marginal hyaline spot [#6] but with 1 elongate pale brown posterior spot. Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with slightly irregular hyaline band from posteroapical margin, extending parallel to costa almost to vein R_{2+3}, slightly tapering anteriorly and broader than marginal brown area. Cell m with 1 elongate [fused #26, #26A] or 2 smaller anteromedial hyaline spots, and with distal marginal hyaline mark [#29] extending to vein M and aligned with hyaline mark in cell r_{4+5} forming irregular band extending anteriorly beyond middle of cell r_{4+5}; also extended very narrowly along posterior margin of cell m. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with large irregular hyaline marks; cell br with subapical hyaline spot [#13]; cell dm with large L-shaped hyaline mark [fused #21, #22, #23, #24], proximal part extending anteriorly to vein M and aligned and connected with subapical spot in cell br [#13], distal part narrower but more elongate, aligned with distal branches of mark in cell cu_1 [#32, #33]; cell cu_1 with large anteriorly trilobed and posteriorly bilobed mark [fused #31, #32, #33, #34, #36, #36A?, #39] in medial half isolating 2 large anterior and 1 posterior brown spots, its proximal part [#31, #34, #39] aligned proximal to hyaline mark in cell dm and extending across apex of vein A_1+Cu_2, narrowly connected to medial part; subapical marginal hyaline spot [#37] moderate sized, not extending to vein Cu_1. Cell dm with anteromedial subapical hyaline spot [#25], small and faint on 1 wing.

Abdomen: All tergites with 2 pairs of evenly spaced isolated dark brown spots, on tergites 3 and 4 irregular and extended to anterolateral corner (probably fused sublateral and anterolateral spots). All tergites also with pair of posterolateral dark brown bands, on tergites 3–5 extending slightly anteriorly on lateral margin.

Distribution. Guatemala. The area of the likely type locality is at 350–450 m elevation.

Type data. Holotype ♂ (MCZ USNMENT00213933), GUATEMALA: La Providencia, Obispo, [no date], C.M. Rouillard. The type locality may be the farm Finca La Providencia [14°19'N 90°58'W] near the Río Obispo and the Obispo train station [14°15’N 90°58’W] near Siquinalá in Escuintla Department. The abdomen of the holotype was dissected prior to our study of it and unfortunately its terminalia are missing.

Etymology. The name of this species is an adjective referring to the isolated proximal hyaline spot in cell m.

***Blepharoneura lutea* Norrbom & Condon, new species**
Figs. 42, 129, 159, 195

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: scutum and scutellum without brown markings; vertex without brown markings; cells cu_1 and dm with 2 relatively straight and narrow hyaline bands; and cell r_{4+5} without hyaline spot near crossvein dm-cu. The aculeus is similar to those of *B. bivittata*, *B. brevivittata*, and *B. fernandezi* in having a broad medial apical concavity, but unlike those species, it has a the sublateral lobe broad, slanted and finely serrate, similar to *B. furcifer*, *B. rupta*, and *B. cornelli*, which differ in having a projecting medial lobe and much smaller submedial lobes.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Occipital suture narrowly orange brown.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta, laterally, and anterolateral third of presutural part; entirely yellow, without dark markings. Scutellum, subscutellum, mediotergite, pleuron and basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta.

Legs: Entirely yellow.

Wing (Fig. 42): Length 5.25–6.53 mm, width 2.60–3.21 mm, ratio 1.91–2.03. Crossvein r-m at 0.47–0.55 distance from bm-cu to dm-cu. Cell c with 2 ovoid hyaline spots, sometimes narrowly separated from costa and/or subcosta by very pale brown areas; medial brown area as dark as area of cell r_1 posterior to pterostigma, with paler medial spot or streak, medial brown area equal to slightly broader than hyaline spots. Pterostigma without subapical hyaline spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot [#8] in r_{2+3} forming acute triangular mark, reaching R_{4+5} or sometimes (1 specimen with small aligned anterior spot [#14]) extended slightly into r_{4+5}; cell r_{4+5} without medial hyaline spot [#15] near anterior end of dm-cu. Distally cell r_1 without hyaline spots [#6]. Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending more or less parallel to costa into cell r_{2+3} almost reaching vein R_{2+3}, slightly to not tapering anteriorly, much broader than marginal brown area. Cells m and r_{4+5} with inverted V-shaped mark [fusion of at least #26, #26A, #27, #29], extending almost to vein R_{4+5} anteriorly and both arms reaching margin in cell m. Cell br with circular subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with 2 elongate hyaline marks, proximal one [aligned and connected #13, #21, #22, #32, #34, #39] extending from cell br subapically, across cells dm and cu_1 subbasally, and across apex of vein A_1+Cu_2, and distal band [fused #24, #33, #36] extending from middle of cell dm to posterior wing margin, bands sometimes (1 wing of 2 specimens) connected narrowly in cell cu_1 along vein Cu_1; cell cu_1 with subapical marginal hyaline spot [#37] moderate to large. Cell dm without subapical hyaline spot [#25].

Abdomen: All tergites with pair of broad irregular dark brown markings, on syntergite 1+2 sometimes divided into 2 small marks on posterior margin; mark on each tergite extended along posterior margin to lateral margin of tergite; markings on tergites 3–5 bi- or trimodal or with 1–2 small to large anterior yellow spots within them; markings broadly separated medially by slightly tapering, nearly straight margined yellow area.

Female terminalia: Oviscape entirely dark brown; length 0.90–1.00 mm. Aculeus (Fig. 129, 159) 0.70–0.75 mm long, 1.63–1.70 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip flared slightly outward basolaterally, short and broad (lobed part 0.27–0.30 times as long as wide), with broad, relatively deep medial apical concavity (1/2–2/3 as deep as length of medial lobes and 1/3–2/5 as broad as distance between apices of submedial lobes) and with 4 pairs of lobes separated by deep gaps; lateral lobe digitiform, broad, minutely serrate; sublateral lobe very broad and slanted, minutely serrate; submedial and medial lobes short and blunt, similar in size. 8th sternite with pair of large setulae on medial

apical corner. Spermathecae subspherical, with convoluted sclerotized neck and small to moderately large cylindrical basal apodeme.

Distribution. Lowland areas of Costa Rica.

Type data. Holotype ♀ (INBio INBio000424938), COSTA RICA: Guanacaste: Parque Nacional Guanacaste, 9 km S of Santa Cecilia, Estación Pitilla, LN 330200 380200, 700 m, 2–9 Mar 1992, C. Moraga. Paratypes: COSTA RICA: Puntarenas: Golfito, 1948, P. & D. Allen, 1♀ (MCZ USNMENT00213824); Osa Peninsula, Rincon, 2.5 mi SW of, 8E42'N 83E29'W, 8–12 Mar 1967, OTS Adv. Zoo. Course, 1♀ (USNM USNMENT00213791).

Etymology. The name of this species is an adjective referring to its almost entirely yellow body.

***Blepharoneura macwilliamsae* Norrbom & Condon, new species**
Figs. 3, 43–44, 130

Blepharoneura sp. 43: Norrbom & Condon 1999: 138.

Diagnosis. This species can be distinguished from other species of *Blepharoneura* by the following combination of characters: scutum with 2 pairs of brown vittae; scutellum dorsally and anepisternum entirely yellow; meron with at least a pale brown area; cell r_{2+3} between crossveins r-m and dm-cu more extensively hyaline than brown; and cell r_{4+5} with spot nearest to crossvein dm-cu no more than half as wide as cell. The aculeus tip has a small convex medial lobe rather than a notch or broad concavity as in similar species such as *B. amplihyalina*, *chaconi*, *regina*, *mikenoltei*, and *mexicana*.

Description. Head: Dark brown area on ocellar tubercle less than half distance to postocellar seta or almost to seta. Small medial brown spot often (5 of 11 specimens) present slightly ventral to postocellar seta. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta sometimes interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta sometimes narrowly interrupted at transverse suture, posterior part uninterrupted, separated from mark on posterior margin; posterior margin with 2 broad quadrate dark brown marks narrowly separated. Notopleuron with small brown spot in posterolateral corner, sometimes faint. Small brown spot anterior to postsutural supra-alar seta present, sometimes faint. Small dark brown spot anterior to postalar seta present, sometimes second spot present lateral to postsutural supra-alar seta. Large dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum entirely yellow or with only narrow brown mark ventrolaterally, rarely (2 of 11 specimens) with pair of small, narrow basal brown spots aligned with centers of posterior scutal spots on disk; side usually with small, sometimes faint, brown spot on or near ventrobasal margin. Subscutellum dark brown except narrowly medially. Mediotergite brown except narrowly medially and more broadly dorsolaterally or sometimes (2 Zurquí males) with all of lateral margin yellow. Pleuron mostly yellow, with following markings: medial brown spot, usually small, usually (9 of 11 specimens) present on anepimeron; elongate brown mark ventrally on katatergite and covering most of anatergite or series of 2–3 spots ventrally on katatergite and ventrally and dorsally on anatergite; elongate spot or most of meron brown, occasionally pale brown or orange brown; sometimes (5 of 11 specimens) with dorsal brown spot on katatergite; or less commonly (3 of 11 specimens) with faint diffuse brown mark on posterior half of katepisternum. Basalare entirely yellow or with brown spot. Dorsocentral seta aligned with or usually slightly anterior to postalar seta.

Legs: Mostly yellow. Mid and hind femora with elongate, usually moderately broad anteroventral and posteroventral orange to red brown marks on apical 1/4–1/3. Hind tibia sometimes basally or mostly dark orange.

Wing (Figs. 3, 43–44): Length 7.72–9.01 mm, width 3.76–4.16 mm, ratio 1.98–2.17. Crossvein r-m at 0.52–0.56 distance from bm-cu to dm-cu. Cell c with 2 rectangular to trapezoidal hyaline spots, both reaching costa and subcosta but sometimes fading to pale brown anteriorly and/or posteriorly; medial brown area paler than area of cell r_1 posterior to pterostigma, sometimes paler medially or posteriorly, as broad as to distinctly narrower than basal hyaline spot and usually slightly to distinctly narrower than distal spot. Pterostigma usually with pale brown subapical spot [#3], often poorly differentiated, often reaching R_1 (7 of 11 specimens), but sometimes small (1 specimen) or absent (3 specimens). Cells r_1 and r_{2+3} basally (proximal to apex of R_1) each with 1–2 hyaline or pale brown marks, longer than wide except sometimes distal spot in r_1, usually especially elongate if 1 mark present. Radial cells medially with 1 relatively narrow to slightly broad quadrate basal marginal hyaline mark [#5] in cell r_1; cell r_{2+3} with broad hyaline spot aligned with r_1 mark [#8] and slightly more distal broad to very broad hyaline spot [#9]; cell r_{4+5} with broad hyaline spot [#14] aligned with r_1 mark, sometimes very broad and extending more distally, extending posteriorly slightly more than halfway across cell, with hyaline spot [#15] aligned with or slightly proximal or distal to dm-cu small to moderate sized, and often (6 of 11 specimens) with anterior hyaline spot near midlength [#48], rarely (1 specimen) with 2 additional minute yellowish spots anteriorly. Distally cell r_1 usually without marginal hyaline spot [#6] (present on 1 wing of 1 specimen) but with 1–3 (usually 2) pale brown posterior spots. Cell r_{2+3} with 2 marginal hyaline marks [#10, 11], proximal mark extending to vein R_{4+5}, distal mark often (8 of 11 specimens) fused with spots in cell r_{4+5} [#16, #18] to form concave band extending to posteroapical margin of cell r_{4+5}. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3} or with distal mark or fused with distal mark to form band, occasionally with second small spot aligned with proximal mark in r_{2+3}; in males with small isolated medial and/or posterior hyaline spot(s) aligned with proximal mark in cell m, in females with large posterior hyaline mark fused with proximal mark in cell m to form band, and usually also fused with distal mark in cell m to form irregular inverted V-shaped mark; with 1 marginal spot [#18], but in 1 wing each of 2 specimens crescent-shaped or constricted [fused spots #18, #18A ?], isolated [5 specimens] or connected to anterior spot [#16]. Cell m without small proximal hyaline spot [#49] near midlength of dm-cu; with 2 hyaline marks, proximal mark [fused #26A, #26, #27?] large but usually narrowly separated from margin (touching in 1♂, 3♀), in male not reaching vein M, in female forming continuous band with spot in cell r_{4+5}, distal mark [#29] in male usually not reaching vein M, in female reaching vein M and usually connected with spot in r_{4+5} to form inverted V-shaped mark. Cell br with relatively large quadrate subbasal hyaline spot [#12]. Cell bm with single broad hyaline area [fused #19, #20]. Cell bcu occasionally (3 specimens) with pale brown spot in lobe, sometimes extending anteriorly into cell cu_1. Posteromedial part of wing with large broad hyaline areas; cell br with broad quadrate subapical hyaline spot [#13] and usually smaller but broad usually quadrate more proximal spot [#44], both reaching and anterior and posterior margins of cell, occasionally fused into 1 very broad mark; cell dm with long broad hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50] sometimes partially narrowly divided medially by faint brown, aligned with broad hyaline area in cell cu_1, anteriorly extending to or beyond r-m, but tapered distally, extending farther posteriorly than anteriorly; cell cu_1 with large medial hyaline area [fusion of at least #31, #32, #33, #34, #36, #36A], usually anteriorly trilobed and posteriorly bilobed, including 2 anterior and 1 subbasal marginal or submarginal brown spots, very broad on posterior wing margin; subapical marginal hyaline spot [#37] large, reaching or almost reaching vein Cu_1, occasionally connected to large proximal hyaline area. Cell dm with medial and/or anterior subapical hyaline spot [#25?] and usually with posterior subapical hyaline spot [#53] (absent in 3 specimens), occasionally connected to proximal hyaline area, aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow, all tergites with 4 rows of evenly spaced dark brown spots, with additional anterolateral spot slightly separated from margin (often fused with sublateral spot), and with paired bands on posterior margin, narrowly connected or usually narrowly separated medially, on tergites 3–6 extending anteriorly on lateral margin; spots on syntergite 1+2 and tergite 5 sometimes connected to posterior band.

Female terminalia: Oviscape mostly orange, distal 1/5–1/3 dark brown, dorsally up to basal half also dark brown; length 1.10 mm. Aculeus (Fig. 130) 0.85–0.93 mm long, 1.98–2.04 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.25–0.31 times as long as wide), with small, convex medial lobe and 3 pairs of step-like lobes; sublateral lobe larger than submedial lobe; lobes separated by deep gaps, lateral gap 1.07–1.23 times as long as wide. Spermathecae subspherical, with slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta subequal to medial prensiseta.

Distribution. Costa Rica. The type specimens were collected between 1600–2350 m elevation.

Type data. Holotype ♀ (USNM USNMENT00048601), COSTA RICA: San José: Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, May 1995, P. Hanson. Paratypes: COSTA RICA: Cartago: Cañon Genesis II, 4 km NE of, 9°42'30N 83°54'30W, 2350 m, Apr 1995, P. Hanson, 1♀ (UCRSJ USNMENT00048929) 1♀ (TAUI USNMENT00048930); same, Jun 1995, 1♀ (USNM USNMENT00048612); same, Mar 1996, 1♀ (USNM USNMENT00048929); same, May 1996, 1♀ (USNM USNMENT00213841); La Cangreja, 9°48'N 83°58'W, 1950 m, Sep-Dec 1992, P. Hanson, 1♂ (UCRSJ USNMENT000050085) 1♀ (USNM USNMENT00048509). San José: San Gerardo de Dota, 9°33'N 83°48'W, 2200 m, 12 Jan 1996, C. W. Young, 1♂ (CMP USNMENT00213843); San Gerardo de Dota, 9°33'N 83°48'W, forest behind Albergue Savegre, Sendero Los Robles, approx. 1 km up trail, 2300 m, emerged 25 Aug 1997 reared by B. Gamboa from larva mining stem of *Sechium* sp. collected 21 May 1997, P. Quesada, A. L. Norrbom, E. Rojas, B. Gamboa, F. A. Quesada, J. Gonzalez & M. A. Zumbado, 97–BGR-025.3, 1♂ (INBio INBio002151652); Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Apr-May 1993, P. Hanson, 1♂ (USNM USNMENT00048483); same, Aug 1995, 1♂ (USNM USNMENT00048624); San Gerardo, by secluded waterfall on stream in front of Albergue Savegre lodge, reared ex stem of *Sechium pittieri* collected 20 Jan 2000, pupariated 21–22 Jan, eclosed Feb 2000, M. A. Condon, Ble140, 1♀ (USNM).

Etymology. The name of this species is a noun in the genitive case named for Trinity McWilliams, a student at Cornell College, who skillfully captured an adult of this species when it was on the terminal meristem of a branch of *Sechium pittieri*.

Biology. A single adult male of this species was reared in 1997 from larvae mining stems of a cucurbit identified as *Sechium* sp. by botanist José Gonzalez (INBio, Costa Rica) by spotting flowers in the canopy. A total of 8 larvae were found, mostly by Pancho Quesada, all of which had mined at least 2–3 feet of stems found on or near ground level.

The female reared from *S. pittieri* (Figs. 210–211) developed from one of six larvae found mining stems at San Gerardo in January, 2000. We were unable to rear four of these larvae. The fifth developed into a male with an unusual wing pattern. It may be an aberrant specimen of *B. macwilliamsae*. One of these larvae was found in a stem with gelatinous sap oozing from openings in two internodes (between second and third, and between third and fourth nodes from the meristem). One of the larvae consumed almost 5 meters of stem.

Blepharoneura marshalli Norrbom & Condon, new species

Figs. 45, 102–104, 114–115, 166

Diagnosis. This species and *B. amplihyalina* differ from other species of *Blepharoneura* by the extremely large hyaline area in cells dm and cu_1 that completely lacks brown spots within it and from most other species by the distal location of crossvein r-m, which is more than 0.65 of the distance from bm-cu to dm-cu (this distance exceeds 0.60 only in some *B. zumbadoi*, *chaconi*, *nigriapex* and *mikenoltei*). *Blepharoneura marshalli* differs from *B. amplihyalina* in the shape of the aculeus, the tip of which is shorter, with angular and evenly spaced lobes, and a broad and shallow medial apical concavity. In *B. amplihyalina* the tip is elongate triangular with weak step-like lobes and a strong narrow notch in the medial lobe.

Description. Head: Dark brown area on ocellar tubercle extended less than half to half distance to postocellar seta. Medial occipital sclerite with pair of pale brown to dark brown submedial vittae on ventral half. Occipital suture narrowly orange brown to dark brown.

Thorax (Figs. 102–104): Postpronotal lobe entirely yellow or often with minute brown spot at junction with anepisternum. Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta interrupted or narrowed posterior to transverse suture, occasionally interrupted anterior to suture, well separated from marks on posterior margin; sublateral vitta with presutural part usually extended to level of supra-alar seta (interrupted in 2 specimens), postsutural part nearly complete or (holotype and 1♂) reduced to spot posterior to transverse suture; posterior margin with 2 well separated brown marks. Notopleuron usually with brown vitta on lateral margin, occasionally absent (1♂) or reduced to anterior and posterior spots (1♂). Small brown spot anterior to postsutural supra-alar seta, brown spot anterior to postalar seta, and small brown spot lateral to dorsolateral corner of scutellum present. Sometimes small spot lateral to postsutural supra-alar spot (aligned with postalar spot) also present. Scutellum with single medial spot, usually not extended beyond basal half (with elongate medial extension in 1♂), not extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, sometimes moderately broad but not reaching lateral margin of mediotergite. Pleuron entirely or mostly yellow. Anepisternum often (3♂) with small brown spot dorsal to anterior seta. Anatergite usually (5 of 7 specimens) with small to moderately large dorsomedial red brown or brown spot. Basalare with brown spot or entirely brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Entirely yellow. Rarely [USNMENT00213853, left leg only] hind femur with orange brown spot on margin of anteroventral apical ridge.

Wing (Fig. 45): Length 6.50–7.50 mm, width 3.00–3.56 mm, ratio 2.06–2.26. Crossvein r-m at 0.66–0.74 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted triangular hyaline spots, both reaching costa and usually subcosta (distal spot smaller in holotype, not reaching subcosta); medial brown area sometimes fading posteriorly or medially, anterior part almost as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, slightly narrower to broader than hyaline spots. Pterostigma sometimes with pale brown subapical spot [#3], but usually small or absent, rarely (1♂) large and reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–4 (usually 2–3) and 0–3 (usually 1–2) hyaline spots, respectively. Radial cells medially with broad basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1 and aligned broad hyaline mark [fused #8 and #9] in cell r_{2+3} forming tapering triangular to quadrate mark, broadly touching R_{4+5}; cell r_{4+5} with hyaline spot [#15] near anterior end of dm-cu moderate sized to minute, often pale brown and/or touching vein M, aligned with or slightly proximal or distal to dm-cu, and also with additional tiny hyaline to pale brown spots, 0–4 on or near anterior margin and 1–3 on or near posterior margin. Distally cell r_1 rarely (1♂) with 1 small marginal hyaline spot [#6], often (4 of 7 specimens) with 1–2 small pale brown posterior spots. Cell r_{2+3} with 2 marginal hyaline marks, brown area between them sometimes (2 specimens) pale and diffuse, proximal mark [#10] extending to vein R_{4+5} or faintly divided into marginal and posterior spots, distal mark [#11] often small and not reaching R_{4+5}. Cell r_{4+5} usually with small hyaline spot [#16] anteriorly (absent in at least 1 wing of 3 specimens), aligned between apical marks in cell r_{2+3} or with distal mark; usually with small posterior hyaline spot aligned with hyaline mark in cell m; and with 1 small ovoid marginal or submarginal hyaline spot [#18], rarely with second more anterior spot [#18A] (minute in Campo Quijano ♂). Cell m usually (6 of 7 specimens) with small subbasal hyaline spot [#49] near midlength of dm-cu; with large irregular or posteriorly forked medial hyaline mark [fusion of at least #26A, #26, #27, #28] and with small distal marginal spot [#29], or with one large irregular mark [fusion of at least all of these spots]. Cell br with subbasal pale brown spot [#12]. Cell bm with circular subbasal and subapical hyaline spots or usually with single broad hyaline area [fused #19, #20]. Cell bcu occasionally with small pale brown spot in lobe. Posteromedial part of wing with extremely large subrectangular hyaline area; cell br with broad rectangular subapical hyaline area [at least #13] extending from anterior to posterior margin, rarely with small to minute pale brown spot well proximal to broad subapical hyaline area; cell dm with large hyaline area

[fusion of at least #51, #52, #21, #22, #23, #24, #50] aligned with large hyaline area in cell cu_1, anteriorly extended to or (1♂) almost to level of r-m, distal margin transverse or slightly oblique; cell cu_1 with hyaline area [broad fusion of at least #31, #32, #33, #34, #36, #36A] covering medial half or more, very broad on posterior wing margin, usually with diffuse faint brown submarginal spot subbasally but without other brown spots medially; subapical marginal hyaline spot [#37] small to moderate sized, usually not reaching vein Cu_1. Cell dm occasionally (2♂) with 1 small pale brown posterior subbasal spot, without usual subapical hyaline spot [#25] (unless fused with large medial hyaline area), sometimes with small anterior, medial and/or posterior [#53] more distal hyaline spot(s) more or less aligned with subapical mark in cell cu_1.

Abdomen (Figs. 114–115): Mostly yellow. Syntergite 1+2 with 4 evenly spaced dark brown spots, submedial and sublateral spots occasionally connected, spot on posterolateral corner, and occasionally with faint brown submedial band on posterior margin (much paler than other spots if present); other tergites with 4 rows of evenly spaced spots, anterolateral spot touching or almost touching lateral margin, and L-shaped band or pair of spots on lateral and posterior margins, separated medially, on tergite 5 and sometimes tergites 3–4 connected to anterolateral spot, lateral margin always with at least small spot on tergites 3 but entirely brown on tergite 5; submedial and sublateral spots on tergite 4 sometimes connected; and some or all spots and bands on tergite 5 often connected or occasionally largely fused except medially.

Female terminalia: Oviscape entirely dark brown; length 1.20 mm. Aculeus (Fig. 166) 0.77 mm long, 2.01 times as long as wide, without scales dorsally or ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.39 times as long as wide), with moderately broad, shallow medial apical concavity (less than 1/3 as broad as distance between apices of submedial lobes) and 4 pairs of step-like lobes; sublateral and submedial lobes similar in size; lobes separated by moderately deep gaps, lateral gap 1.18 times as long as wide, gap between medial and submedial lobes slightly more than half as long as wide. Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta two-thirds as large to subequal to medial prensiseta.

Distribution. Northwestern Argentina (Jujuy, Salta). The only type specimens for which elevation data was provided by the collector were taken at 1500 m.

Type data. Holotype ♀ (USNM USNMENT00054209), ARGENTINA: Salta: 30 km E [sic?, W?] of Salta, Campo Quijano [24°55'S 65°39'W], El Corrallo, 20 Feb 1992, S. A. Marshall. Paratypes ARGENTINA: Jujuy: Yuto [23°38'S 64°28'W], [no date], J. Foerster, 1♂ (CAS USNMENT00213860). Salta: 10 km N La Caldera forest, Camino la Cornisa, 1500 m, 27 Feb 1992, S. A. Marshall, 1♂ (DEBUG USNMENT00054211) 1♂ (IML USNMENT00213852) 1♂ (USNM USNMENT00054210); Campo Quijano, El Alisal [24°51'S 65°41'W], forest remnant, 18 Feb 1992, S. A. Marshall, 1♂ (DEBUG USNMENT00213854); Canyada la Gotera, 19 Feb 1992, S. A. Marshall, 1♂ (DEBUG USNMENT00213853).

Etymology. The name of this species is a noun in the genitive case honoring the outstanding collecting efforts and contributions to dipterology by Steve Marshall, who collected most of the type series.

Remarks. The label of the holotype indicates that it was collected east of the city of Salta, but the only locality in Salta named Campo Quijano that we could locate in gazetteers is approximately 28 km WSW of Salta, and the “E” on the label may be a lapsus. The males of this species and *B. amplihyalina* were tentatively separated.

***Blepharoneura mexicana* Norrbom & Condon, new species**
Figs. 46–47, 146–148, 169, 201

Blepharoneura sp. 8: Norrbom & Condon 1999: 146.

Diagnosis. This species differs from other species of *Blepharoneura* by the following combination of characters: Scutellum dorsally and anepisternum entirely yellow; cell r_{2+3} between crossveins r-m and dm-cu more extensively hyaline than brown (spots large); and cell r_{4+5} with hyaline spot nearest to dm-cu less than 2/3 width of cell. The aculeus is most similar to those of *B. chaconi* and *mikenoltei*, lacking small scales on the medial membrane, and the tip with a moderately broad medial concavity and 4 pairs of step-like lobes. The gap between the medial and submedial lobes is more pronounced than in *B. chaconi*, and the medial concavity is narrower than in *B. mikenoltei*.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta or reaching level of that seta medially. Medial occipital sclerite with pair of pale brown to red brown submedial vittae on ventral half. Occipital suture narrowly orange brown to dark brown.

Thorax: Scutum entirely microtrichose, often (16 of 24 specimens) with narrow brown spot or vitta bordering postpronotal lobe extending posteriorly at most to level of presutural supra-alar seta, occasionally (5 of 19 specimens) with small submedial brown spot aligned with or slightly posterior to postsutural supra-alar seta; posterior margin with 2 well separated brown marks, sometimes small or pale; usually without other brown markings, rarely (1 specimen [USNMENT00213818]) with posterior brown spot on notopleuron and L-shaped vitta from anterior to postsutural supra-alar seta to postalar seta or (2 specimens) with small brown spot anterior to postalar seta. Scutellum entirely yellow. Subscutellum and mediotergite with pair of narrow to moderately broad brown vittae, rarely (3 specimens) also with ventral half of lateral margin of mediotergite brown or (1 specimen) both sclerites entirely yellow. Pleuron mostly or entirely yellow. Anepimeron usually (15 of 24 specimens) with small to moderately large pale brown to dark brown medial spot. Anatergite occasionally (3 specimens) with brown spot ventrally. Dorsocentral seta aligned with or slightly anterior or posterior to postalar seta.

Legs: Entirely or mostly yellow. Mid or hind femora occasionally (Guatemalan specimens, 2 Mexican specimens [USNMENT00213807–08]) with slightly darker orange to brown anteroventral and posteroventral apical marks.

Wing (Figs. 46–47): Length 6.14–6.80 mm, width 2.83–3.15 mm, ratio 2.10–2.27. Crossvein r-m at 0.53–0.55 distance from bm-cu to dm-cu. Cell c with 2 broad rectangular hyaline spots, both reaching costa and subcosta; medial brown area almost as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes faint medially or posteriorly, distinctly narrower than both hyaline spots. Pterostigma usually with subapical hyaline to pale brown spot [#3] (absent in 2 of 24 specimens) but size of spot variable, often faint, minute or small but occasionally reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) usually without hyaline spots or only with spot in r_1 posterior to apex of vein Sc, occasionally (2 Guatemalan specimens) with 1–2 small hyaline spots in cell r_{2+3}. Radial cells medially with 1 broad quadrate basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1; cell r_{2+3} with 2 broad hyaline spots [#8, #9] or 1 extremely broad hyaline mark, sometimes partially divided, posterior to r_1 mark; cell r_{4+5} with large hyaline spot [#14] aligned with r_1 mark, extending from R_{4+5} halfway to completely across cell, small to large hyaline spot [#15] aligned with or slightly distal to dm-cu, and often (11 of 21 specimens) with anterior hyaline spot [#48] near midlength not touching vein R_{4+5}. Distally cell r_1 usually with 1 marginal hyaline spot [#6], rarely (1 Guatemalan ♂) without spots or (3 Mexican specimens) with second small marginal spot; without posterior spots. Cell r_{2+3} with 2 large marginal hyaline marks [#10, #11], occasionally partially connected or brown area between them sometimes pale and diffuse, both extending to or almost to vein R_{4+5}, proximal spot rarely (2 specimens) divided into marginal and posterior spots. Cell r_{4+5} usually (except 2 Guatemalan males) with small hyaline spot [#16] anteriorly, usually aligned between apical marks in cell r_{2+3}; with small to large ovoid

posterior hyaline spot aligned with proximal mark or between hyaline marks in cell m; and with 1 large, often bilobed marginal or submarginal hyaline spot [probably fused #18 and #18A] or rarely (2 Mexican specimens, 1 wing of holotype) with 2 separate small ovoid hyaline spots [#18, #18A]. Cell m sometimes (9 of 21 specimens) with subbasal hyaline spot [#49] near midlength of dm-cu; and with 2–3 large ovoid hyaline spots, 2 marginal [#27, #29] and 1 anteromedial spot [fused #26A, #26], or usually with anteromedial and proximal spots connected or fused to form elongate mark. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20], often connected medially, or with single broad hyaline area [fused #19, #20]. Cell bcu rarely (2 specimens) with hyaline spot in lobe and extending anteriorly into cell cu_1. Posteromedial part of wing with large broad hyaline areas; cell br with large subapical hyaline spot [#13] and often with smaller more proximal spot [#44]; cell dm with long broad hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50, often #25?], sometimes partially divided medially, aligned with broad hyaline area in cell cu_1, tapering distally and broadest posteriorly or more transverse distally or with anterodistal extension [if connected or fused with #25]; cell cu_1 with large medial hyaline area [fusion of at least #31, #32, #33, #34, #36], anteriorly trilobed and posteriorly bilobed, or more broadly fused, including 1 or usually 2 small anterior and 1 subbasal marginal or submarginal brown spots; subapical marginal hyaline spot [#37] large, reaching or almost reaching vein Cu_1. Cell dm with large anterior subapical hyaline spot [#25?] usually connected to or fused with proximal hyaline area (sometimes not obviously discernable), and occasionally (5 specimens) with very small posterior hyaline spot [#53] aligned with subapical mark in cell cu_1.

Abdomen: All tergites with 4 evenly spaced dark brown spots, sublateral pair sometimes absent on syntergite 1+2, and 2 pairs of spots (more medial pair sometimes absent on syntergite 1+2) or pair of posterolateral dark brown bands on posterior margin, on tergites 3–5 L-shaped but lateral margin yellow anteriorly, bands separated medially except occasionally on tergite 5; sublateral spot sometimes connected to posterior band on tergites 3 or 4.

Female terminalia: Oviscape entirely dark brown; length 1.00–1.20 mm. Aculeus (Figs. 146–148, 169) 0.76–0.84 mm long, 2.45–2.86 times as long as wide, without scales dorsally or ventrally on membrane medially; tip angular basolaterally, relatively short triangular (lobed part 0.40–0.51 times as long as wide), with moderately broad, shallow medial apical concavity (less than 1/4 as broad as distance between apices of submedial lobes) and 4 pairs of step-like lobes; sublateral and submedial lobes similar in size; lobes separated by moderately deep gaps, lateral gap 1.50–2.00 times as long as wide, gap between medial and submedial lobes about half as long as wide. Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on curved lobe, lateral prensiseta small, less than half as wide as medial prensiseta, acute, dark brown (Fig. 201).

Distribution. Guatemala, Mexico (Distrito Federal, Mexico, Zacatecas).

Type data. Holotype ♀ (USNM USNMENT00671223) GUATEMALA: Guatemala: near Santa Elena Barrillas, near start of road to TV antennas, 14.40511°N 90.53711°W, 1690 m, emerged 27–31 Aug 2008 reared ex stem mines in *Sicyos* sp., poss. *longisepalus* (07G53) collected 22 Nov 2007, B.D. Sutton, G.J. Steck, A.L. Norrbom, J. Monzón. Paratypes: GUATEMALA: Guatemala: near Santa Elena Barrillas, near start of road to TV antennas, 14.40511°N 90.53711°W, 1690 m, emerged 27–31 Aug 2008 reared ex stem mines in *Sicyos* sp., poss. *longisepalus* (07G53) collected 22 Nov 2007, B.D. Sutton, G.J. Steck, A.L. Norrbom, J. Monzón, 1♀ (USNM USNMENT00671222); same, emerged 28–31 Jul 2008, 1♂ (USNM USNMENT00104281), 1♀ (FSCA USNMENT00104281), 1♂ (UVG USNMENT00104281). MEXICO: [unspecified locality], A. C. Baker no. 191a, 1♂2♀ (USNM USNMENT00213817, USNMENT00213820–21) 1♀ (TAUI USNMENT00213818) 1♀ (CDFA USNMENT00213819); same, A. C. Baker no. 194, 1♀ (USNM USNMENT00213816). Distrito Federal: Camino de Camarones, 6 Sep 1937, W. E. Stone, 2♀ (USNM USNMENT00213814–15); Mexico City, 27 Aug 1922, E. G. Smyth, 1♀ (USNM USNMENT00213858);

Mexico City, 16 Aug 1956, R. & K. Dreisbach, 3♀ (USNM USNMENT00213808–10); Tacubaya, Sep, 2♂ (IEXV USNMENT00213811–12). Mexico: Chapingo, 10 Jul 1962, Rios, 1♂ (IEXV USNMENT00213813); Chapingo, 3 km S of, 31 Jul 1962, R. F. Smith, 1♀ (UCB USNMENT00213804); Chapingo, 3 km S of, "*Cucurbita*", 31 Jul 1962, P. D. Hurd, 1♀ (UCB USNMENT00213805); same, 3 Aug 1962, 1♂ (UCB USNMENT00213807) 1♀ (USNM USNMENT00213806). Zacatecas: Nochistlan, 22 Sep 1975, B. Villegas, 1♀ (UCD USNMENT00214443).

Etymology. The name of this species is an adjective referring to the country where most of the type series was collected.

Biology. One adult specimen was collected on a species of *Cucurbita*, but there is no indication that the plant is a host. The Guatemalan specimens were reared from larvae mining stems of a species of *Sicyos*, possibly *longisepalus* Cogn. (Figs. 215–218). The larvae are slender compared to those of fruit and flower infesting *Blepharoneura* species.

***Blepharoneura mikenoltei* Norrbom & Condon, new species**
Figs. 48, 168

Diagnosis. This species is similar to *B. chaconi* in wing pattern, the relatively distal position of crossvein r-m, and aculeus shape but differs as follows: Cell r_{4+5} distally with 2 marginal or submarginal spots; cell dm proximal to r-m with 3–4 well separated hyaline spots; scutum without brown vittae; and scutellum dorsally without brown markings. The aculeus is similar to those of *B. chaconi* and *mexicana*, lacking small scales on the medial membrane, and the tip with a moderately broad medial concavity and 4 pairs of step-like lobes, but the tip is slightly more elongate and the medial concavity is broader than in those species. The holotype is teneral and although it is possible that its thoracic markings are not fully developed, the wing pattern and shape of the aculeus indicate that it is not conspecific with *B. chaconi*.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Scutum entirely microtrichose, yellow except pair of large quadrate dark brown spots near posterior margin. Notopleuron entirely yellow. Small faint brown spot anterior to postsutural supra-alar seta, diffuse brown spot lateral to postsutural supra-alar seta, small brown spot anterior to postalar seta, and faint brown spot lateral to dorsolateral corner of scutellum present. Scutellum entirely yellow. Subscutellum brown except medially. Mediotergite brown except medially and narrowly dorsolaterally. Pleuron mostly yellow. Anepimeron with large posteromedial brown spot extending to extreme anterior margin of katatergite. Anatergite with large posteroventral brown area. Basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta.

Legs: Mostly yellow. Hind femur with elongate, moderately broad anteroventral and posteroventral orange brown marks on apical 1/3. Mid femur with similar elongate but narrower anteroventral and posteroventral marks.

Wing (Fig. 48) [teneral]: Length 7.35 mm, width 3.40 mm, ratio 2.16. Crossvein r-m at 0.65 distance from bm-cu to dm-cu. Cell c with 2 hyaline spots, basal spot narrow, not reaching costa on one wing, distal spot trapezoidal, reaching costa and subcosta; medial brown area slightly paler than area in cell r_1 posterior to pterostigma, much broader than basal hyaline spot and slightly broader than distal spot. Pterostigma with small to large subapical hyaline spot [#3] touching R_1 but not reaching costa. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) each with 1–2 hyaline spots. Radial cells medially with 1 relatively narrow, rounded quadrate to slightly tapered basal marginal hyaline mark [#5] in cell r_1; cell r_{2+3} with broad hyaline spot [#8] aligned with r_1 mark and slightly more distal very broad hyaline spot [#9]; cell r_{4+5} with anterior spot [#14] slightly distal to r_1 mark and large spot [#15] anterior to dm-cu, on left wing fused to form irregular spot, and with small

anterior spot [#48] near midlength almost touching vein R_{4+5}. Distally cell r_1 with 1 small marginal subapical hyaline spot [#6], and with 2 more proximal small posterior hyaline spots. Cell r_{2+3} with 1 elongate marginal hyaline mark [#10] and 1 small rounded submarginal spot [#11], both extending to vein R_{4+5}. Cell r_{4+5} with small hyaline spot [#16] on anterior margin aligned between apical marks in cell r_{2+3}, with large posterior hyaline spot aligned with proximal spots in cell m, with 3 smaller rounded hyaline spots distal to it (1 near posterior margin, aligned with distal spot in m; 1 submarginal spot near posterior margin [#18], and 1 marginal or submarginal medial spot [#18A]). Cell m with 3 large hyaline spots, 2 marginal [#27, 29] and 1 anteromedial [fused #26A, #26], anteromedial and distal spots almost touching vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with multiple large hyaline spots and marks; cell br with moderately large ovoid subapical hyaline spot [#13] and smaller more proximal spot [#44]; cell dm with broad spot subbasally across cell [fused #51, #52, sometimes #21?], broader anteriorly or subquadrate, its proximal part aligned with spot in cell br [#44] and proximal branch of trilobed fork in cell cu_1 [#31]; cell dm sometimes (1 wing) with separate hyaline anterior spot [#21] aligned with subapical spot in cell br [#13], with isolated anterior spot [#50] aligned with or slightly proximal to r-m, and with broad posteromedial spot [#23 and/or #24] aligned with distal branches of tribobed mark in cell cu_1; cell cu_1 medially with large trilobed hyaline mark [fusion of at least #31, #32, #33, #36], proximally narrowly separated from marginal mark [fused #34, #39] across apex of vein A_1+Cu_2; medial and distal branches of mark sometimes (1 wing) largely fused; subapical marginal spot [#37] moderate sized. Cell dm with subapical hyaline spot [#25] moderately large, extended to vein M; also with posterior subapical hyaline spot [#53] touching vein Cu_1 aligned with subapical spot in cell cu_1.

Abdomen: Mostly yellow, all tergites with 4 rows of evenly spaced dark brown spots and with paired bands on posterior margin, separated medially, on tergites 3–6 extending anteriorly on entire lateral margin.

Female terminalia: Oviscape entirely brown; length 1.32 mm. Aculeus (Fig. 168) 1.10 mm long, 3.41 times as long as wide, without scales dorsally or ventrally on membrane medially; tip angular basolaterally, moderately elongate triangular (lobed part 0.54 times as long as wide), with broad shallow medial apical concavity (about half as broad as distance between apices of submedial lobes) and 4 pairs of step-like lobes; sublateral lobe larger than submedial lobe; lobes separated by long, relatively shallow gaps, lateral gap 1.95 times as long as wide, gap between medial and submedial lobes slightly longer than wide. Spermathecae subspherical, with straight, slender sclerotized neck and large cylindrical basal apodeme.

Distribution. Costa Rica. The holotype was collected at 2500 m elevation.

Type data. Holotype ♀ (INBio INBio001111275), COSTA RICA: Heredia: Parque Nacional Braulio Carrillo, Estación Barva, LN 233400 523200, 2500 m, Jun 1990, A. Fernandez.

Etymology. The name of this species is a noun in the genitive case named for Mike Nolte, the brother of Matt Nolte, a student at Cornell College who helped us to score and homologize wing pattern characters.

Blepharoneura multipunctata Norrbom & Condon, new species

Figs. 49, 167

Diagnosis. This species resembles *B. amplihyalina*, *apaapa*, *hyalinella*, *bipunctata* and *nigriapex* in having a dark brown spot posterodorsally on the anepisternum, a single medial brown spot on the scutellum, and 3 hyaline marginal spots in cell m. It differs from all of them except *B. bipunctata* in having 2 narrow marginal hyaline marks basally in cell r_1 rather than a single broad one, and from *B. bipunctata* in lacking an anepimeral brown spot and having a strong medial concavity on the aculeus tip.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Medial occipital sclerite with pair of brown submedial vittae on ventral half. Occipital suture narrowly dark brown.

Thorax: Postpronotal lobe mostly yellow, with small brown spot at junction with anepisternum and larger, diffuse brown spot on posterolateral margin. Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 2 broad quadrate dark brown marks narrowly separated. Notopleuron dark brown except small yellow area surrounding posterior seta. Small brown spot anterior to postsutural supra-alar seta, large dark brown spot lateral to postsutural seta, small dark brown spot anterior to postalar seta, and large dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single moderately large medial brown spot. Subscutellum and mediotergite with pair of moderately broad dark brown vittae. Pleuron mostly yellow. Anepisternum with dark brown spot dorsal to anterior seta. Anatergite dark brown except anterior corner and posterodorsal 1/4. Basalare entirely brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur with dark brown spot on margin of anteroventral apical ridge. Hind femur with similar smaller spots on anteroventral and posteroventral apical ridges.

Wing (Fig. 49): Length 8.12 mm, width 3.47 mm, ratio 2.34. Crossvein r-m at 0.55 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area as dark as area in cell r_1 posterior to pterostigma, much broader than basal hyaline spot and slightly broader than distal spot. Pterostigma with large subapical hyaline spot [#3] reaching or almost reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 3 and 2–4 pale brown spots, respectively. Radial cells medially with 2 narrow basal marginal hyaline marks in cell r_1, both reaching R_{2+3}, basal mark [#5] subovoid; cell r_{2+3} with 1 small hyaline spot [#8] aligned with basal mark in r_1 and 1 broad or 2 narrowly connected spots [#9] aligned with second mark in r_1; cell r_{4+5} with small hyaline spot [#14] in anterior half of cell aligned with proximal r_1 mark, with small hyaline spot [#15] aligned with dm-cu, and also with additional tiny hyaline spots, 4–5 near anterior margin and 3–4 on or near posterior margin. Distally cell r_1 with 2 small marginal hyaline spots [#6 and additional spot]. Cell r_{2+3} with 2 marginal hyaline marks [#10, 11], proximal mark extending to vein R_{4+5} on right wing but divided into marginal spot and spot touching R_{4+5} on left wing. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3} or with distal mark; with small posterior hyaline spot aligned with medial spot in cell m; and with 2 small rounded marginal hyaline spots [#18, #18A]. Cell m with small subbasal hyaline spot [#49] near midlength of dm-cu and another spot near anterobasal corner; with 3 ovoid marginal hyaline spots [proximal #27, distal #29], medial spot [fused #26, #26A, #28] largest, irregular, extended to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu with small hyaline spot in lobe. Posteromedial part of wing with very large hyaline marginal area; cell br subapically with hyaline spot [#13] and smaller, much more proximal spot; cell dm with 2–3 small subbasal hyaline spots [distal ones #51?, #52?] and larger ovoid posteromedial hyaline spot [fused #22?, #23, #24] (ca. 0.25 times as long as cell along vein Cu_1) much shorter than hyaline mark in cell cu_1 and aligned with its distal half; cell cu_1 with minute anterior spot near base, and with large hyaline area covering medial half [broad fusion of at least #31?, #32, #33, #34, #36, #36A], very broad on posterior wing margin, lacking anterior brown spots and including 2 submarginal brown spots (distal 1 fainter); subapical marginal hyaline spot [#37] relatively small, not reaching vein Cu_1. Cell dm with subapical hyaline spot [#25] moderate sized, and with smaller more distal anterior spot and posterior spot [#53] aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow, with 4 rows of evenly spaced dark brown spots; tergites 3–5 also with anterolateral spot touching or almost touching lateral margin; syntergite 1+2 with dark brown spot in posterolateral corner and submedial band on posterior margin, and tergites 3–6 with L-shaped band in this area, separated medially, on tergites 4 and 5 connected to anterolateral spot.

Female terminalia: Oviscape entirely dark brown; length 0.90 mm. Aculeus (Fig. 167) 0.70 mm long, 1.95 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.34 times as long as wide), with 4 pairs of lobes, medial pair short

and convex, separated by medial concavity as broad as either lobe and as deep as half their length, other 3 pairs of lobes step-like; sublateral lobe larger than submedial lobe; lobes separated by deep gaps, lateral gap 0.89 times as long as wide. Spermathecae subspherical, with slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

Distribution. Ecuador. The holotype was collected at 2600 m elevation.

Type data. Holotype ♀ (MZUSP USNMENT00213911), ECUADOR: Quito, Baeza, Papallacta, E of, 2600 m, Jan 1971, L. E. Peña.

Etymology. The name of this species is an adjective referring to the numerous spots on the wing.

***Blepharoneura nigriapex* Norrbom & Condon, new species**
Figs. 50, 135

Diagnosis. This species resembles *B. amplihyalina*, *apaapa*, *hyalinella*, *multipunctata* and *bipunctata* in having a dark brown spot posterodorsally on the anepisternum, a single medial brown spot on the scutellum, and 3 hyaline marginal spots in cell m. It differs from all of these species in having the entire apical 1/6 of the hind tibia dark brown, and from all of them except *B. amplihyalina* by the large size of the hyaline area in cell dm. The mediotergite lacks the narrow brown mark on the lateral margin found in *B. apaapa* and *hyalinella*, and crossvein r-m is more distal than in those species (at 0.62 distance from bm-cu to dm-cu vs. 0.54–0.58), although these characters may prove to be variable when additional specimens are discovered. The aculeus tip differs from those in *B. amplihyalina*, *hyalinella* and *apaapa* in having the sublateral lobe markedly larger than the submedial lobe.

Description. Head: Dark brown area on ocellar tubercle extended slightly more than half distance to postocellar seta. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half, connected ventrally. Occipital suture narrowly dark brown.

Thorax: Postpronotal lobe mostly yellow, with small dark brown spot at junction with anepisternum, diffuse brown spot on posterolateral margin, and pale brown dorsal spot connected to anterior end of sublateral scutal vitta. Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta interrupted slightly posterior to transverse suture and not connected to marks on posterior margin; sublateral vitta interrupted at transverse suture, postsutural part narrower and paler but uninterrupted, separated from marks on posterior margin; posterior margin with 2 large quadrate dark brown marks. Notopleuron dark brown except small dorsal yellow area extended to posterior seta. Small dark brown spot anterior to postsutural supra-alar seta, another aligned with that seta on lateral margin, dark brown spot anterior to postalar seta, and large dark brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single large somewhat diamond-shaped medial brown spot. Subscutellum and mediotergite with pair of moderately broad dark brown vittae. Pleuron mostly yellow. Anepisternum with dark brown spot dorsal to anterior seta. Anatergite with large dorsomedial dark brown mark. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid tibia with anteroventral apical ridge dark brown. Mid tibial anteroventral basal ridge not visible in holotype. Hind tibia with entire apical 1/6 dark red brown, anteroventral and posteroventral ridges dark brown. Hind tibia with anteroventral and posteroventral basal ridges dark brown.

Wing (Fig. 50): Length 7.92 mm, width 3.66 mm, ratio 2.16. Crossvein r-m at 0.62 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline spots, both reaching costa and subcosta but fading to pale brown posteriorly, more extensively in basal spot; medial brown area almost as dark as area of cell r_1 posterior to pterostigma, slightly broader than basal hyaline spot but slightly narrower than distal spot. Pterostigma with small subbasal and larger subapical [#3] pale orange spots. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 4–5 and 2–4 pale brown spots, respectively. Radial cells medially with 1 relatively narrow inverted trapezoidal basal hyaline mark [#5] in cell r_1, fading to pale brown posteriorly; cell r_{2+3} with 2 small pale brown spots posterior to r_1 mark, basal spot [#8] slightly proximal to or aligned with r_1 mark, distal spot

[#9] slightly distal to it, not reaching R_{4+5}; cell r_{4+5} anteriorly without hyaline spot [#14] aligned with r_1 mark but with small yellowish spot on posterior margin, with small hyaline spot [#15] aligned slightly proximal to dm-cu, and also with additional tiny pale brown spots, 3 on or near anterior margin and 3 on or near posterior margin. Distally cell r_1 with 3 small marginal hyaline spots [#6 and additional spots], also with 1 small pale brown posterior spot. Cell r_{2+3} with 2 small to elongate marginal hyaline marks [#10, 11], proximal mark extending to vein R_{4+5}, slightly constricted on right wing. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3}, with small posterior hyaline spot aligned with medial spot in cell m, and with 1 relatively small rounded marginal spot [#18]. Cell m with small subbasal hyaline spot [#49] near midlength of dm-cu, and 3 ovoid marginal hyaline spots [proximal #27, distal #29], medial spot [fused #26, #26A, #28] largest, broad medially, extended almost to vein M. Cell br with subbasal pale brown spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu with small pale brown spot in lobe. Posteromedial part of wing with very large hyaline area; cell br subapically with hyaline spot [#13] and small to minute, much more proximal pale brown spot; cell dm with 2 small pale brown subbasal spots and large hyaline area [fusion of at least #52, #21, #22, #23, #24, #50] as long as and aligned with hyaline area in cell cu_1, basal part not extending to vein M, distal margin transverse, anterior part extended well beyond level of r-m; cell cu_1 with hyaline area covering more than medial half [broad fusion of at least #31, #32, #33, #34, #35?, #36, #36A], very broad on posterior wing margin, lacking anterior brown spots and with 2 submarginal brown spots, more distal spot diffuse pale brown; subapical marginal hyaline spot [#37] relatively small, not reaching vein Cu_1. Cell dm without usual subapical hyaline spot [#25] (unless fused with large medial hyaline area) and with 1 anterior and 1 posterior [#53] small more distal hyaline spots aligned with subapical mark in cell cu_1.

Abdomen: Mostly yellow, with 4 rows of evenly spaced dark brown spots; tergites 3–5 also with anterolateral spot touching or almost touching lateral margin; all tergites also with pair of spots or band on posterior margin and posterolateral corner, separated medially, on tergites 3–6 extending farther anteriorly on lateral margin.

Female terminalia: Oviscape mostly orange, basal apodemes, very narrow lateral margins, and apical 2/5 dark brown, on dorsal side extending medially almost to base; length 1.14 mm. Aculeus (Fig. 135) 0.80 mm long, 2.13 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.39 times as long as wide), with small, truncate medial lobe and 3 pairs of step-like lobes separated by relatively shallow gaps; sublateral lobe much larger than submedial lobe; lateral gap 1.4 times as long as wide.

Distribution. Bolivia. The holotype was collected at 2000 m elevation in a remnant of Yungas forest.

Type data. Holotype ♀ (ANCB USNMENT00055930), BOLIVIA: La Paz: Sud Yungas, 8 km S of Chulumani, Apa Apa Reserve, upper trail in primary forest, 16°21'15S 67°30'20W, 2000 m, log site, cloudy AM or late afternoon, on undersides of leaves of undetermined Cucurbitaceae (01–Bol-01) or supporting understory plant Solanaceae sp. (01–Bol-03), 1–3 Apr 2001, A. L. Norrbom.

Etymology. The name of this species is a noun referring to the dark brown apex of the hind femur.

Blepharoneura nigrifemur Norrbom & Condon, new species

Figs. 51, 110, 143

Diagnosis. This species belongs to the *femoralis* complex (see diagnosis of *B. femoralis*), species of which are difficult to distinguish except by aculeus shape. That of *B. nigrifemur* has a moderately elongate tip which is somewhat rounded proximal to the lateral lobe. The lobes, particularly the lateral one, are small and blunt, and the sublateral and submedial lobes are similar in size. *Blepharoneura nigrifemur* also differs from the other species of the complex except some specimens of *B. femoralis* by the small size of the subapical marginal hyaline spot in cell cu_1 which does not reach vein Cu_1.

Description. Head: Dark brown area on ocellar tubercle extended to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of brown submedial vittae on ventral half. Occipital suture in broad dark brown area, triangular except for concave ventral margin, extended to eye margin and dorsally beyond lateral vertical seta although sometimes diffuse yellow surrounding seta.

Thorax: Postpronotal lobe entirely yellow or with minute brown spot at junction with anepisternum. Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta strongly narrowed posterior to transverse suture and not connected to mark on posterior margin; sublateral vitta interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially. Notopleuron entirely dark brown. Small brown spot anterior to postsutural supra-alar seta, brown vitta anterior to postalar seta, and large brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single somewhat inverted U-shaped medial mark extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, sometimes very narrowly separated medially, extended to lateral margin on ventral 1/2–2/3 of mediotergite. Pleuron mostly dark brown, yellow only on propleuron, part of anepisternum (at least with large dorsomedial dark brown spot extending ventrally at least 2/3 distance to ventral margin, and ventral 2/3 posterior to phragma dark brown, these areas often connected ventrally), extreme anterior and posterior corners of katepisternum, all of katepimeron, greater ampulla, narrow dorsal and sometimes ventral and posterior margins of anepimeron, and narrow dorsal margin of anatergite. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Fore femur sometimes with small subapical pale brown spot. Mid femur usually with dark brown mark on apical 1/5–1/4, at least on anterior, ventral and posterior sides, occasionally also on dorsal side. Hind femur (Fig. 110) with entire apical 1/3–1/2 dark brown.

Wing (Fig. 51): Length 6.30–6.95 mm, width 3.15–3.30 mm, ratio 2.00–2.14. Crossvein r-m at 0.56–0.60 distance from bm-cu to dm-cu. Cell c with 2 rectangular to trapezoidal hyaline spots, both reaching costa and subcosta; medial brown area as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes faint medially, almost as broad as to distinctly narrower than basal hyaline spot, distinctly narrower than distal spot. Pterostigma with large subapical hyaline spot [#3] usually reaching R_1 (except in 1 of 6 specimens). Cell r_1 basally (proximal to apex of R_1) with pale brown spot posterior to apex of vein Sc and often with second more distal spot; cell r_{2+3} basally usually entirely dark brown, occasionally (1 specimen) with small pale brown spot. Radial cells medially with 1 broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1 partially divided anteriorly and/or posteriorly by brown spot, or with 2 narrower hyaline marks; cell r_{2+3} with 2 hyaline spots [#8, #9] or rarely 1 very broad hyaline spot aligned with r_1 marks, both extending across cell, distal spot broader; cell r_{4+5} in anterior half with small hyaline spot [#14] aligned with middle of r_1 mark(s), approximately half as wide as cell, and with medial hyaline spot [#15] near anterior end of dm-cu small; usually (absent on 1 wing of 1 of 6 specimens) with small to minute anterior hyaline spot [#48] near midlength not touching vein R_{4+5}. Distally cell r_1 with 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 large marginal hyaline marks [#10, #11], proximal mark constricted or usually narrowly divided medially by paler brown area into marginal and posterior spots. Cell r_{4+5} with hyaline spot [#16] anteriorly, aligned between apical marks in cell r_{2+3}; with 1–2 ovoid hyaline spots slightly posterior to midwidth aligned with marks in cell m, in 1 wing of 1 specimen more distal spot connected to posterior marginal spot; and with 2 ovoid marginal or submarginal hyaline spots [#18, #18A]. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 2 large marginal hyaline spots [#27, #29] and 1 large anteromedial spot [fused #26, #26A], sometimes only narrowly separated by pale brown, anteromedial spot almost circular to elongate, occasionally reaching vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with subbasal hyaline spot [#19] small or usually absent, with large circular subapical hyaline spot [#20]. Cell bcu with hyaline spot in lobe, sometimes extended anteriorly into cell cu_1. Posteromedial part of wing with large broad hyaline area; cell br with subapical hyaline spot [#13] and often with smaller more proximal spot [#44]; cell dm with broad and long hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, and sometimes #50 and/or, #25], partially divided by brown area(s) anteriorly and sometimes posteriorly, tapered distally, extending farther

posteriorly than anteriorly, or with anterodistal extension [if fused to #25]; cell cu_1 with broad hyaline area [fusion of at least #31, #32, #33, #34, #36, #36A, #39] covering more than medial half, broad on posterior wing margin, and with 1–2 anterior and 1 marginal brown spots, or occasionally with anterior proximal part nearly isolated as spot [#31]; subapical marginal hyaline spot small, not reaching vein Cu_1. Cell dm with anteromedial subapical hyaline spot [#25] moderately large, narrowly separated from or sometimes (2 specimens) connected to proximal hyaline area.

Abdomen: Predominantly brown with yellow spots. Syntergite 1+2 sometimes with isolated pair of submedial brown spots, but often narrowly connected to posterolateral brown area to form irregular mark. Tergites 3–5 with typical 2 pairs of spots, L-shaped posterolateral band, and anterolateral spot fused to form pair of irregular often somewhat W-shaped lateral dark brown marks, separated medially, or with submedial and anterolateral spots sometimes isolated.

Female terminalia: Oviscape entirely dark brown; length 0.84–0.88 mm. Aculeus (Fig. 143) 0.60 mm long, 1.75 times as long as wide, with acute scales medially on membrane dorsally and ventrally; tip rounded basolaterally, moderately elongate triangular (lobed part 0.58 times as long as wide), with convex medial lobe and 3 pairs of small, blunt, step-like lobes; lateral lobe very small; sublateral and submedial lobes similar in size; gap between lateral and sublateral lobes broad and shallow, other gaps deeper. Spermathecae subspherical, with straight slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta on short lobe.

Distribution. Bolivia. The type specimens were collected at 2000 m elevation in a remnant of Yungas forest.

Type data. Holotype ♀ (ANCB USNMENT00055923), BOLIVIA: La Paz: Sud Yungas, 8 km S of Chulumani, Apa Apa Reserve, upper trail in primary forest, 16°21'15S 67°30'20W, 2000 m, log site, cloudy AM or late afternoon, on undersides of leaves of undetermined Cucurbitaceae (01–Bol-01) or supporting understory plant Solanaceae sp. (01–Bol-03), 1–3 Apr 2001, A. L. Norrbom. Paratypes: Same data as holotype, 1♂ (ANCB USNMENT00055922) 2♂2♀ (USNM USNMENT00055920–21, USNMENT00055924–25).

Etymology. The name of this species is a Latin noun in reference to the dark brown apex of the hind femur.

Blepharoneura osmundsonae Norrbom & Condon, new species

Figs. 52, 182–183

Diagnosis. This species belongs to the *femoralis* complex (see diagnosis of *B. femoralis*), species of which are difficult to distinguish except by aculeus shape. That of *B. osmundsonae* has the most elongate tip of the species of the complex (lobed part more than 0.60 times as long as wide) and it is somewhat rounded proximal to the lateral lobe. The lobes are small but acute and similar in size. The scales of the medial membrane are present only dorsally and are plate-like except proximally, differing from other species of the complex (except one female of uncertain identity; see Remarks for *B. biseriata*).

Description. Head: Dark brown area on ocellar tubercle not extended posteriorly [specimens teneral?] or extended more than half distance to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown, usually (except 1 specimens) on lateral side bordered by slightly paler band, extended dorsolaterally to postocular setae but well separated dorsally from lateral vertical seta.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta, laterally, and sometimes anteriorly medial to and lateral to submedial vitta, or often sparsely microtrichose on posterior half to 2/3 of postsutural sublateral vitta; scutum also with 2 pairs of dark brown vittae or rows of spots; submedial vitta interrupted or (1 specimen) narrowed slightly posterior to transverse suture and not connected to mark on

posterior margin; sublateral vitta broadly interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially. Notopleuron with dark brown vitta on lateral margin. Small brown spot anterior to postsutural supra-alar seta usually present, sometimes faint or (3 specimens) absent. Brown vitta anterior to postalar seta and brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of submedial brown marks or single inverted U-shaped medial mark usually extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, mediotergite also with lateral margin on ventral half narrowly brown. Pleuron mostly dark brown, yellow only on propleuron, most of anepisternum (except large dorsomedial dark brown spot extending ventrally at least to level of anterior seta but not more than midway to ventral margin, and narrowly in posteroventral corner), extreme posterior corner of katepisternum and sometimes irregular anterodorsal area, all of katepimeron, greater ampulla, narrow dorsal, ventral and posterior margins of anepimeron, and narrow dorsal margins of katatergite and anatergite expanding to larger spot posterodorsally on katatergite and anteriorly on anatergite. Basalare brown. Dorsocentral seta aligned with or usually slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur occasionally with anteroventral and posteroventral dark brown marks on apical 1/5. Hind femur with entire apical 1/5 dark brown.

Wing (Fig. 52): Length 5.94–6.60 mm, width 2.87–3.10 mm, ratio 2.06–2.13. Crossvein r-m at 0.55–0.60 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area almost as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, distinctly narrower or (1 specimen) almost as broad as both hyaline spots. Pterostigma with subapical hyaline spot [#3], often reaching R_1 (small in 3 of 9 specimens). Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–3 and 0–2 (usually 0) pale brown or hyaline spots, respectively. Radial cells medially with 1 broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1, usually partially divided posteriorly by brown spot, or with 2 narrower hyaline marks; cell r_{2+3} with 2 hyaline spots [#8, #9] aligned with r_1 mark(s), sometimes connected, both extending across cell, distal spot broader; cell r_{4+5} in anterior half with small to moderately large hyaline spot [#14] aligned with middle of r_1 marks, at most slightly more than half as wide as cell, and with medial hyaline spot [#15] near anterior end of dm-cu small; occasionally (2 of 9 specimens) with small to minute anterior hyaline spot [#48] near midlength not touching vein R_{4+5}. Distally cell r_1 usually with 1 marginal subapical hyaline spot [#6] (absent on 1 wing of 2 specimens). Cell r_{2+3} with 2 marginal ovoid hyaline spots and usually with 1 smaller subapical spot posterior to proximal spot (absent in 1 of 9 specimens) [divided #10, #11]. Cell r_{4+5} usually with small hyaline spot [#16] anteriorly (absent in 2 of 9 specimens), aligned between apical marks in cell r_{2+3}; with 1 or usually (6 of 9 specimens) 2 posterior ovoid hyaline spots, if only 1 present aligned between marks in cell m or with proximal mark; and with 2 ovoid marginal or submarginal hyaline spots, in 1 specimen connected to form bilobed mark [#18, #18A]. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 2 large marginal hyaline spots [#27, #29] and 1 large anteromedial spot [fused #26, #26A], proximal and anteromedial spots sometimes connected or fused to form band, usually not extending to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm sometimes with subbasal hyaline spot [#19], with large circular subapical hyaline spot [#20]. Cell bcu usually with hyaline spot in lobe. Posteromedial part of wing with large hyaline areas; cell br with subapical hyaline spot [#13] and usually with smaller more proximal spot [#44]; cell dm with broad and long hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50], sometimes narrowly or partially divided by pale brown into 2–3 spots, tapered distally, extending farther posteriorly than anteriorly; cell cu_1 medially with broad anteriorly trilobed and posteriorly bilobed mark [fused #31, #32, #33, #34, #36, #36A], broad on posterior wing margin, sometimes with proximal anterior spot [#31] separate from rest of mark; subapical marginal hyaline spot [#37] reaching vein Cu_1. Cell dm with separate anteromedial subapical hyaline spot [#25], rarely (Valle de Bravo ♀) with posterior subapical spot proximal to level of subapical mark in cell cu_1 and connected to proximal hyaline area.

Abdomen: Syntergite 1+2 sometimes with isolated pair of submedial brown spots, but usually spot narrowly connected to posterolateral brown area to form irregular mark. Tergites 3–5 with typical 2 pairs of spots, L-shaped posterolateral bands, and often anterolateral spots; sublateral spots and posterolateral bands fused, except sometimes on tergite 5, to form pair of irregular, medially separated brown marks; submedial spots usually isolated, and anterolateral spots, if present, isolated.

Female terminalia: Oviscape entirely dark brown; length 1.00–1.40 mm. Aculeus (Fig. 182–183) 0.70–0.86 mm long, 2.39–2.61 times as long as wide, medial membrane with plate-like polygonal scales dorsally, becoming acute proximally, ventrally without scales; tip rounded basolaterally, elongate triangular (lobed part 0.63–0.66 times as long as wide), with small, weakly trilobed medial lobe and 3 pairs of small, acute, somewhat step-like, distally directed lobes separated by relatively shallow gaps; sublateral and submedial lobes similar in size. Spermathecae subspherical, with straight slender sclerotized neck and usually with large cylindrical basal apodeme (apodeme absent in 2 of 3 spermathecae of Valle de Bravo ♀) (similar to *B. femoralis*).

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta on short lobe.

Distribution. Mexico (Mexico). The holotype was collected at nearly 2700 m elevation.

Type data. Holotype ♀ (MSUL USNMENT00213953), MEXICO: Mexico: El Yukon, 20 km W of Toluca, 8800 ft. [2683 m], 4 Aug 1962, G. L. Bush. Paratypes: Same data as holotype, 1♂2♀ (MSUL USNMENT00213955–56, USNMENT00213961); same, except 8 Aug 1962, 1♂ (MSUL USNMENT00213958) 1♂2♀ (USNM USNMENT00213954, USNMENT00213957, USNMENT00213959). MEXICO: Mexico: Valle de Bravo [19°11'N 100°08'W], 7 Oct 1962, F. Pacheco, 1♀ (IEXV USNMENT00213962).

Etymology. The name of this species is a noun in the genitive case named for Erika Osmundson, a student at Cornell College who helped with this revision by devoting a summer to sketch the male terminalia of numerous species.

Blepharoneura punctistigma Norrbom & Condon, new species

Figs. 53–54, 181

Diagnosis. This species, *B. splendida, sinepuncta*, and *aspiculosa* differ from other *Blepharoneura* species in having the thoracic pleuron largely brown, the apical fourth or more of the hind femur dark brown, and the distal part of the wing with oblique bands. *B. punctistigma* is very similar to *B. aspiculosa*. It differs by aculeus shape (apex slightly shorter, gaps between lobes deeper) and the presence of medial scales; the hyaline subapical band usually constricted along vein R_{4+5}; and cell dm often with 2 separate hyaline areas in the basal 3/4 (occasionally connected as in *B. aspiculosa*). These two species differ from *B. splendida* and *sinepuncta* by their markings in cell dm (subapical spot [#25] isolated and distal to posteromedial spot aligned with r-m [#24]) and the pterostigma (always with a subapical spot, which is absent in *B. sinepuncta* and usually absent in *B. splendida*). The aculeus tip is similar to that of *B. splendida*, but the gap between the lateral and sublateral lobes is shallower and more elongate (1.50–1.78 vs. 0.98–1.29 in *B. splendida*).

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of pale brown to dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown, on lateral side bordered by variably shaped brown area extending as band or triangular mark towards postocular setae, occasionally reaching eye margin or including lateral vertical seta (4 of 14 specimens).

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta narrowed or interrupted posterior to transverse suture and usually separated from mark on posterior margin (connected in 3 of 14 specimens); sublateral vitta interrupted at transverse suture and narrowly separated from mark on posterior margin; posterior margin with 1 broad brown mark narrowed medially. Notopleuron

entirely brown or often with small pale area surrounding posterior seta. Small brown spot anterior to postsutural supra-alar seta often absent or faint, sometimes connected along transverse suture to lateral vitta. Brown vitta anterior to postalar seta present. Brown spot lateral to dorsolateral corner of scutellum present. Scutellum with single inverted U-shaped or inverted mushroom shaped medial brown mark extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, on ventral half of mediotergite extended to lateral margin or with separate narrow brown mark on margin. Pleuron mostly dark brown, yellow only on propleuron, anterior margin of anepisternum and broadly bordering phragma, all or most of katepimeron, greater ampulla, and margins of anepimeron, and dorsal margin of anatergite. Basalare with brown spot or entirely brown. Dorsocentral seta aligned with or slightly anterior or posterior to postalar seta. Legs: Mostly yellow. Mid femur sometimes with anteroventral and posteroventral brown marks on apical 1/5–1/4. Hind femur with entire apical 1/4–2/5 dark brown.

Wing (Figs. 53–54): Length 5.05–6.35 mm, width 2.60–3.17 mm, ratio 1.92–2.05. Crossvein r-m at 0.54–0.59 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, as broad as to distinctly narrower than both hyaline spots. Pterostigma with large subapical hyaline to pale brown spot [#3] reaching R_1. Cell r_1 basally (proximal to apex of R_1) with 1 pale brown to hyaline spot posterior to apex of vein Sc and occasionally with second more distal spot; cell r_{2+3} basally with 0–1 spots. Radial cells medially with broad tapering basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1 and aligned spots in r_{2+3} [#8] and r_{4+5} [#14] (latter occasionally absent) forming acute triangular mark, extended at most midway across r_{4+5}; cell r_{4+5} with hyaline spot [#15] near anterior end of dm-cu usually (except in 3 specimens) extending to vein M. Distally cell r_1 rarely (Costa Rican and Xalapa, Mexico specimens) with marginal hyaline spot [#6], or posteriorly (4 specimens) with small spot near apex of band in cell r_{2+3}. Cell r_{2+3} usually without marginal hyaline marks (1 Costa Rican, 2 Mexican specimens with tiny hyaline spot at apex of vein R_{2+3}). Cell r_{4+5} with hyaline band from posteroapical margin, extending parallel to costa to or almost to vein R_{2+3}, not extended into r_1, usually constricted along vein R_{4+5}, slightly to strongly tapering anteriorly, as broad as to much broader than marginal brown area. Cells m and r_{4+5} with inverted V-shaped hyaline mark [fusion of at least #26A, #26, #27, #29], extending to or almost to vein R_{4+5}, both arms reaching margin in cell m. Cell br with subbasal hyaline spot [#12]. Cell bm usually with broad hyaline area [fused #19, #20] or with only medial or subapical circular hyaline spot [#20], occasionally with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu usually with hyaline spot in lobe. Anal lobe hyaline except brown area from apical part of lobe of cell bcu and base of vein A_1+Cu_2 crossing apex of vein A_2, rarely (Xalapa ♀) with small brown submarginal spot medially proximal to A_2. Posteromedial part of wing with 2 broad hyaline bands, connected medially in cell cu_1 and sometimes in cell dm (brown area between bands in cu_1 frequently faint or pale), often forming somewhat H-shaped hyaline mark; cell br with subapical hyaline spot [#13], but without more proximal spot [#44]; cell dm with proximal hyaline band [fused #21, #22, sometimes #52? when broad posteriorly] aligned and usually connected with subapical hyaline spot [#13] in br, also aligned and connected with proximal hyaline mark in cell cu_1 [#32] and usually (10 of 13 specimens) connected with posterior mark across vein A_1+Cu_2 [#34, #39]; cell dm posteromedially with broad hyaline area [#23, #24], sometimes connected to proximal band, aligned and connected with band in cell cu_1 [fusion of at least #33, #36] to form band extending to wing margin; cell cu_1 occasionally (2 specimens) also with small anterior proximal hyaline spot [#31] aligned with proximal margin of hyaline band in dm (which is broad posteriorly in those specimens); subapical marginal hyaline spot [#37] large, reaching vein Cu_1.Cell dm with anteromedial subapical hyaline spot [#25] isolated and distal to distal part of proximal mark, usually extended to vein M.

Abdomen: Syntergite 1+2 with pair of irregular posterolateral brown marks formed from fused submedial and sublateral spots and posterolateral band. Tergites 3–5 occasionally with isolated pair of submedial brown spots or less commonly also with pair of isolated sublateral brown spots or anterolateral brown spots, but

usually with these spots connected or fused to posterolateral brown band to form irregular, sometimes somewhat W-shaped mark, separated medially, occasionally very broad laterally (without or with small anterior sublateral yellow area).

Female terminalia: Oviscape entirely dark brown, length 0.85–1.25 mm. Aculeus (Fig. 181) 0.60–0.66 mm long, 1.88–2.10 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.41–0.45 times as long as wide), with small, convex medial lobe and 3 pairs of step-like lobes separated by relatively shallow gaps; sublateral lobe larger than submedial lobe; lateral gap 1.50–1.78 times as long as wide. Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta on short lobe.

Distribution. Tropical Mexico (Chiapas, Veracruz), Guatemala, Costa Rica. Specimens for which elevation data were provided by the collectors were taken at 480 to 2300 m elevation.

Type data. Holotype ♀ (USNM USNMENT00048684), COSTA RICA: San José: Empalme, 2 km W of, 2300 m, Jan 1995, P. Hanson. Paratypes: GUATEMALA: Baja Verapaz: Salama, Pantín - Santa Rosa road, 1700 m, 6m Malaise trap, 10–15 Jun 2007, J. Monzón & F. Camposeco, 1♀ (USNM USNMENT00654010). Guatemala: Amatitlán, 6 Aug 1965, P. J. Spangler, 1♂ (USNM USNMENT00213880); Santa Catarina Pinula, Puerta Parada, Schuster property, 14.5564°N 90.4635°W, 1860 m, Malaise trap, 22–29 Sep 2007, J. C. Schuster, 2♂ (UVG USNMENT00212041–42), 2♂ (FSCA USNMENT00212043–44), 1♂1♀ (USNM USNMENT00212045–46). Suchitepéquez: Santa Barbara, Finca Panama, 1100 m, Malaise trap, 1–8 Nov 2007, J. P. Pérez & J. Monzón, 2♂1♀ (FSCA USNMENT00654003–05); same, 2–15 Jun 2007, J. P. Pérez, 1♂ (FSCA USNMENT006540011). MEXICO: Chiapas: 49 km S of Jaltenango, [Parque Natural] El Triunfo, [15°40'N 92°48'W], 1300–2000 m, 13–15 May 1985, A. Freidberg, 1♀ (USNM USNMENT00213913). Veracruz: Estación de Biología Los Tuxtlas, 15 Apr 1986, P. Sinaca, 1♀ (IEXV USNMENT00213914); Estación de Biología Los Tuxtlas, El Viguia, 480 m, 15 Mar 1986, E. Ramírez, 1♂ (IEXV USNMENT00213875); Xalapa, 28 Sep - 3 Oct 1961, R. & K. Dreisbach, 1♀ (MSUL USNMENT00213915).

Etymology. The name of this species is a noun referring to the hyaline spot on the pterostigma useful to differentiate this species from *B. splendida* and *B. sinepuncta*.

***Blepharoneura quadristriata* Wulp**

Figs. 55–56, 89, 98–99, 125, 160, 192, 202

Blepharoneura quadristriata Wulp 1899: 411 [in key], 413 [description]; Aczél 1950: 197 [in catalog, as synonym of *B. poecilosoma*]; Foote 1965: 241 [type data]; Foote 1967: 18 [in catalog, as synonym of *B. poecilosoma*]; Norrbom *et al.* 1999: 106 [in catalog, as valid name].
Blepharoneura poecilosoma var. *quadristriata*: Hendel 1914: 21 [in key, in catalog].
Blepharoneura poecilosoma f. *quadristriata*: Hering 1942: 134 [in key].
[not] *Blepharoneura quadristriata*: Enderlein 1911: 432 [misidentification of *B. diva* Giglio-Tos].

Diagnosis. This species differs from other species of *Blepharoneura* by the following combination of characters: scutum with 2 pairs of brown vittae or rows of spots, interrupted along transverse suture, and postsutural lateral vitta usually connected to submedial spot on posterior margin; cell r_{2+3} with 2 elongate marginal hyaline marks, proximal mark extending to middle of cell r_{4+5}, distal mark often forming concave band extending to margin of r_{4+5}; and abdominal tergites each with 1 pair of large dark brown spots without yellow spots within them. The aculeus tip is elongate triangular with a very broad, truncate or slightly concave or convex medial lobe and 3 pairs of small, acute lobes.

Description. Head (Fig. 89): Dark brown area on ocellar tubercle usually extended less than half distance to postocellar seta, occasionally (3 of 12 specimens) more than half distance to seta. Small brown spot often (7 of 12 specimens) present surrounding and posteromesal to medial vertical seta. Occipital suture narrowly

orange brown to brown. Small diffuse brown spot occasionally (4 of 12 specimens) touching and ventral to lateral vertical seta.

Thorax (Figs. 98–99): Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, with 2 pairs of red brown to dark brown vittae; submedial vitta extended almost to transverse suture but often not reaching anterior margin, postsutural part at least pair of spots or vittae extending anteriorly to level of postsutural supra-alar seta, sometimes (5 of 11 specimens) connected to mark or marks on posterior margin; sublateral vitta with presutural part relatively broad, not extended anteriorly to medial corner of postpronotal lobe, occasionally (4 of 12 specimens) narrowly connected anteriorly to submedial vitta, postsutural part usually (except 1 teneral specimen) connected to dark brown marks on posterior margin to form L-shaped or U-shaped marking; posterior margin with pair of dark brown marks, sometimes (5 of 11 specimens) connected medially. Notopleuron and sides of scutum without brown markings except sometimes with brown spot (1 specimen) or extension of sublateral vitta (5 specimens) immediately posterior to intra-alar seta. Scutellum entirely yellow or (6 of 11 specimens) with pair of sublateral brown spots (aligned with or lateral to medial marginal seta). Subscutellum and mediotergite dark brown except medially and dorsolateral corner and sometimes narrow lateral margin of mediotergite, or occasionally (3 of 12 specimens) both sclerites entirely yellow. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned posterior to postalar seta, closer to or aligned with intra-alar seta.

Legs: Mostly or entirely yellow. Tibiae, especially hind tibia, and anteroventral and posteroventral areas on apical 1/5–1/4 of mid and hind femora [e.g., USNMENT00213851] often slightly darker orange or orange brown.

Wing (Figs. 55–56): Length 4.85–5.20 mm, width 2.55–2.72 mm, ratio 1.85–1.96. Crossvein r-m at 0.51–0.59 distance from bm-cu to dm-cu. Cell c with 2 rectangular to trapezoidal hyaline spots, both reaching costa and subcosta; medial brown area slightly to distinctly paler than area of cell r_1 posterior to pterostigma, as broad as to much narrower than both hyaline spots, occasionally paler medially. Pterostigma with large subapical hyaline or pale brown spot [#3], usually reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots except for spot in r_1 posterior to (in 1 specimen also slightly distal to) apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and with aligned spots in r_{2+3} [#8] and r_{4+5} [#14], usually forming acute triangular to nipple-shaped mark, spot in r_{2+3} rarely not extending to R_{2+3} (1 specimen); spot in r_{4+5} [#14] touching R_{4+5} but extended less than halfway across cell; cell r_{2+3} usually (except in 1 wing of Costa Rican ♂) with more distal hyaline spot [#9], touching R_{4+5} and sometimes also R_{2+3}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small to moderate sized. Distally cell r_1 usually with 1 subapical marginal hyaline spot [#6], occasionally narrowly separated from costa or rarely (1 Mexican ♂) without hyaline spot. Cell r_{2+3} with 2 elongate marginal hyaline marks, proximal mark [#10] aligned with hyaline mark in cell cell r_{4+5} forming band extending to middle of cell r_{4+5}, distal mark [#11] often connected with hyaline marks in r_{4+5} [including #18] forming concave band extending to margin of r_{4+5}, but r_{4+5} sometimes with isolated marginal spot [#18]. Cell m with 2 marginal hyaline marks [fused #26A, #26 and #27, and #29], 1 or both often reaching vein M, but neither extending into cell r_{4+5}. Cell br with subbasal hyaline spot [#12]. Cell bm usually without distinct subbasal spot [#19] (present in only 1 specimen and connected posteriorly with subapical spot), with small circular to large elongate medial spot [when large possibly fused #19 and #20], or with circular subapical spot [#20] only. Posteromedial part of wing with large hyaline mark including broad subtriangular subbasal area in cell dm [fused #21, #22, #23, #24, probably also #51, #52], connected with moderately large subapical hyaline spot [#13] in cell br and sometimes also with small more proximal posterior hyaline spot [#44] in br, posteriorly aligned and connected with H-shaped area medially in cell cu_1 [fusion of at least #32, #33, #34, #36, #39], isolating 2 brown spots (1 anterior, 1 posterior). Cell cu_1 with subapical marginal hyaline mark [#37] moderate to large. Cell dm with subapical hyaline spot [#25] usually moderate sized, occasionally small (1 specimen), faint, pale brown (1 specimen), or absent (1 specimen), or connected to large proximal hyaline mark (2 specimens).

Abdomen (Fig. 125): All tergites with 1 pair of broad dark brown spots, sometimes forming vittae; each spot often (7 of 12 specimens) extended along posterior margin of tergite to lateral margin; spots even margined medially, separated by broad, tapering, straight margined yellow area; brown spots solid, without yellow spots within them.

Female terminalia: Oviscape entirely dark brown; length 0.64–0.75 mm. Aculeus (Fig. 160) 0.54–0.58 mm long, 1.66–1.72 times as long as wide, dorsally and ventrally with acute scales in medial membrane; tip rounded basolaterally, elongate triangular (lobed part 0.57–0.60 times as long as wide), with very broad, truncate or very slightly concave or convex medial lobe and 3 pairs of small, acute, somewhat step-like, distally directed lobes separated by elongate, relatively shallow gaps; lateral gap 1.75–2.23 times as long as wide. Spermathecae subconical to semicircular, neck with very short, straight, weakly sclerotized basal part, abruptly expanded to very stout, cylindrical, sclerotized part, and with large stout cylindrical basal apodeme (Fig. 192).

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on long curved lobe (Fig. 202).

Distribution. Lowland to moderately high elevation areas (up to 1600 m) of tropical Mexico (Veracruz, Tabasco), Guatemala, Costa Rica, and possibly Colombia. The only record from the latter country is based on a specimen intercepted in a shipment from Colombia. The records from Baños, Ecuador and Costa Rica reported by Enderlein (1911) were based on misidentified specimens of *Blepharoneura diva* Giglio-Tos.

Type data. Holotype ♂ (BMNH), MEXICO: Tabasco: Teapa, Feb, H. H. Smith [examined].

Other specimens examined. COLOMBIA: [unspecified locality; probably port interception, shipment from Colombia], at light in banana hold, lot #41-9441, 5 Jun 1941, A. B. Wells, 1♀ (USNM USNMENT00213861). COSTA RICA: Alajuela: Upala, 20 km S of, 13 Dec 1990, F. D. Parker, 1♂ (USU USNMENT00214948). GUATEMALA: Huehuetenango: Jacaltenango, La Laguna, orillas Río Azul, 730 m, Malaise trap, 11–31 Nov 2007, F. Camposeco & J. Monzón, 1♀ (USNM USNMENT00654002). Suchitepéquez: Patulul, Finca Tarrales, 1000 m, 8–14 Feb 2007, J. Monzón & F. Camposeco, 1♂ (FSCA USNMENT00654060); Santa Barbara, Reserva Refugio Quetzal UVG, 14.5418°N 91.1973°W, 1600 m, Malaise trap, 3–20 Aug 2007, J. P. Pérez & J. Monzón, 1♂ (FSCA USNMENT00654001). MEXICO: Veracruz: Estación de Biología Los Tuxtlas, Incand. light, 13 Jan 1984, G. J. Steck, 1♀ (FSCA USNMENT00214950); Estación de Biología Los Tuxtlas, 160 m, 30 Apr 1985, P. Sinaca, 1♂ (IEXV USNMENT00213851); same, 1 May 1985, 1♂ (USNM USNMENT00054201); same, 3 Jun 1985, 1♂ (IEXV USNMENT00213850); same, 12 Aug 1985, 1♀ (IEXV USNMENT00054200); same, 5 Aug 1985, E. Ramírez, 1♂ (IEXV USNMENT00213848); same, 12 Aug 1985, E. Ramírez, 1♀ (USNM USNMENT00213849); Lago Catemaco, 18 Jun 1969, B. V. Peterson, 1♀ (CNC USNMENT00214949).

Remarks. Following Hendel (1914), this name was long considered a variety or synonym of *B. poecilosoma* (Schiner), which belongs to the *poecilosoma* species group. It actually is quite distinct from that species, differing by its scutal markings, more extensive hyaline wing markings, and genitalia.

A badly damaged male in the USNM from Higuito, San Mateo, Costa Rica is similar to this species in thoracic pattern and other characters, but it lacks hyaline subapical spots in the pterostigma and cell r_1, and its identity is uncertain.

Blepharoneura quetzali Norrbom & Condon, new species

Figs. 57, 150–151

Diagnosis. This species differs from all other *Blepharoneura* species in the shape of its aculeus, which is elongate triangular with a broad, shallow medial concavity and only 2 pairs of small step-like lobes. It can also be recognized by the following combination of characters: pterostigma without subapical hyaline spot; scutum with 2 pairs of brown vittae; anepisternum entirely yellow; cell r_1 without subapical hyaline or pale brown spot; cell r_{2+3} distally with 1 marginal hyaline spot; and cell cell r_{4+5} distally with hyaline band across

cell. It is similar to *B. variabilis* in wing pattern, but the spot in cell r_{4+5} near crossvein dm-cu [#15] is slightly distal to the crossvein, rather than aligned with or proximal to it as in *B. variabilis*. The aculeus has a much shallower medial concavity and fewer lobes (2 rather than 4 pairs) than that of *B. variabilis*.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Medial occipital sclerite with pair of pale brown submedial vittae on ventral half. Occipital suture narrowly brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta paler anterior to transverse suture and interrupted posterior to suture, not connected to mark on posterior margin; sublateral vitta ending at transverse suture; posterior margin with pin medially in holotype, with brown marking (probably 2 separate spots). Notopleuron with small posterior brown spot on lateral margin. Small brown spots anterior to postsutural supra-alar seta, anterior to postalar seta, and lateral to dorsolateral corner of scutellum present, latter faint. Scutellum entirely yellow. Subscutellum and mediotergite with pair of dark brown vittae, moderately broad. Pleuron mostly yellow, sometimes with small brown medial spot on anepimeron (right side). Basalare with faint brown spot. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid and hind femora with elongate, moderately broad anteroventral and posteroventral brown marks on apical 1/4.

Wing (Fig. 57): Length 6.83 mm, width 3.22 mm, ratio 2.12. Crossvein r-m at 0.55 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area distinctly paler than area of cell r_1 posterior to pterostigma, fainter medially, and very slightly narrower or broader than hyaline spots. Pterostigma without subapical hyaline spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with orange spot in cell r_1 posterior to apex of vein Sc. Radial cells medially with relatively narrow, tapering basal marginal hyaline mark [#5] in cell r_1 and with aligned spots in r_{2+3} [#8] and r_{4+5} [#14], spot in r_{2+3} not reaching R_{2+3} but touching R_{4+5}; aligned spot [#14] in r_{4+5} broadly touching R_{4+5}, about half as wide as cell, not extended to vein M; cell r_{2+3} with more distal, moderately large hyaline spot [#9], touching R_{2+3} and R_{4+5}; cell r_{4+5} with spot [#15] anterior and slightly distal to crossvein dm-cu, without additional anterior hyaline spot [#48] near midlength. Distally cell r_1 without hyaline spot [#6]. Cell r_{2+3} with 1 marginal hyaline mark [#10] at apex of R_{2+3}, extending to vein R_{4+5}, sometimes broad posteriorly [fused with interior part of #11] and narrowly separated from distal hyaline mark in cell r_{4+5}, or with separate more distal posterior hyaline mark [interior part of #11] aligned with and connected to distal hyaline mark in cell r_{4+5} forming band extending to posteroapical margin of r_{4+5}, part of band in r_{4+5} relatively straight or concave. Cell r_{4+5} also with large posterior hyaline spot aligned with hyaline marks in cell m. Cell m with 2 elongate marginal hyaline marks [proximal mark fusion of #26A, #26 and #27; distal mark #29], both or only distal mark connected to spot in cell r_{4+5} forming band or inverted V-shaped mark. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with several large hyaline markings; cell br with large subapical hyaline spot [#13]; cell dm with 1 broad broad hyaline mark in basal 3/5 [fused #51, #52, #21, #22, #23 and/or #24] extending proximal to subapical spot [#13] in cell br, proximal part aligned with proximal anterior spot in cell cu_1 [#31], broader posteriorly than anteriorly; cell cu_1 medially with 3 anterior [#31, #32, and #33] hyaline marks, at least distal 2 connected to medial marginal spot [#36] to form Y-shaped or trident shaped mark, separated from proximal marginal hyaline spot [#34]; subapical marginal hyaline spot [#37] not extending to vein Cu_1. Cell dm with anterior subapical hyaline spot [#25] relatively large, extended to vein M.

Abdomen: All tergites with 4 evenly spaced dark brown spots, L-shaped posterolateral dark brown band or separate lateral and posterior spots, separated medially, and on tergites 3–4 anterolateral dark brown spot.

Female terminalia: Oviscape entirely dark brown; length 1.3 mm. Aculeus (Figs. 150–151) 0.9 mm long, 3.75 times as long as wide, without scales dorsally or ventrally on membrane medially; lateral margin with minute serrations basally on tip; tip subtriangular and relatively long (tapered part 0.71 times as long as wide),

with broad shallow medial apical concavity bordered by 2 pairs of small step-like lobes; medial and submedial lobes separated by elongate shallow gap slightly longer than wide. Spermathecae subspherical, with long, straight, slender sclerotized neck and with small cylindrical basal apodeme.

Distribution. Guatemala. The holotype was collected at 1600 m elevation in the Universidad del Valle reserve on the Pacific side of Volcán Atitlan.

Type data. Holotype ♀ (FSCA USNMENT00654000), GUATEMALA: Suchitepéquez: Santa Barbara, Reserva Refugio Quetzal UVG, 14.5418°N 91.1973°W, 1600 m, Malaise trap, 10–20 May 2007, J. P. Pérez.

Etymology. The name of this species is a noun in the genitive case derived from the name of the Universidad del Valle reserve where the holotype was collected.

Blepharoneura regina Giglio-Tos

Figs. 58–59, 170, 191

Blepharoneura regina Giglio-Tos 1893: 9; Giglio-Tos 1895: 56 [type data; additional description]; Hendel 1914: 20 [in key], 21 [in catalog]; Aczél 1950: 197 [in catalog]; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 106 [in catalog].

Blepharoneura sp. 22: Condon & Norrbom 1999: 161.

Diagnosis. This species differs from other species of *Blepharoneura* by the following combination of characters: Scutellum dorsally and anepisternum entirely yellow; cell r_{2+3} between crossveins r-m and dm-cu more extensively hyaline than brown (spots large or fused); cell r_{4+5} with hyaline spot or mark nearest to dm-cu more than 3/4 width of cell; and cell r_1 with 2–3 marginal hyaline spots in addition to the large basal spot distal to apex of vein R_1. The aculeus differs from all other *Blepharoneura* species by the narrowness of the lobed part (less than 1/3 of aculeus width) and the evenly rounded, minutely serrate lateral margin.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta or reaching it. Medial occipital sclerite occasionally (3 of 8 specimens) with pair of faint brown submedial vittae on ventral half. Occipital suture narrowly orange brown to dark brown.

Thorax: Scutum entirely microtrichose, with 1 pair of submedial brown marks on anterior margin (holotype) or usually 2 pairs of red brown to dark brown vittae or rows of spots; submedial vitta often reduced to 1–3 spots (at least spot on anterior margin present, and except in holotype, also 1 spot near midway between transverse suture and posterior margin present), at maximum narrow but continuous from anterior margin to midway between transverse suture and posterior margin, always well separated from marks on posterior margin; sublateral vitta usually almost complete, but broadly interrupted at transverse suture, postsutural part absent in 2 teneral specimens, entire vitta absent in holotype; posterior margin with 2 well separated quadrate or subtriangular dark brown marks. Notopleuron often (4 of 8 specimens) with small brown spot near anterior seta on lateral margin, sometimes (2 specimens) also with small brown spot near posterior seta on lateral margin. Small brown spot anterior to postsutural supra-alar seta often (5 of 8 specimens) present, sometimes faint. Sometimes (1 of 4 specimens with character visible) with small brown spot anterior to postalar seta. Small brown spot posterior to intra-alar seta often (5 of 8 specimens) present. Scutellum entirely yellow. Subscutellum and mediotergite with pair of brown vittae or entirely brown except medial vitta on both sclerites and dorsolateral corner of mediotergite. Pleuron mostly yellow, with following brown marks: medial brown spot on anepimeron; sometimes (4 of 8 specimens) with medial brown spot on meron and brown spot ventrally on anatergite and katatergite; less commonly (2 of 8 specimens) with brown spot on posterior half of katepisternum. Basalare entirely yellow. Dorsocentral seta aligned with or usually slightly anterior to postalar seta.

Legs: Entirely yellow.

Wing (Figs. 58–59): Length 6.70–8.24 mm, width 2.93–3.56 mm, ratio 2.22–2.43. Crossvein r-m at 0.48–0.57 distance from bm-cu to dm-cu. Cell c with 2 broad rectangular to trapezoidal hyaline spots, both reaching

costa and subcosta; medial brown area almost as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes faint anteriorly and/or posteriorly, distinctly narrower than both hyaline spots. Pterostigma with large subapical hyaline spot [#3], usually reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–4 and 2–3 hyaline spots, respectively. Radial cells medially with 1 slightly to very broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1; cell r_{2+3} with 2 broad hyaline spots [#8, 9] or 1 extremely broad hyaline mark [fused #8 and 9]; cell r_{4+5} with large, broad hyaline spot [#14] aligned with r_1 mark and large broad hyaline spot [#15] slightly proximal to anterior end of dm-cu, both at least 3/4 width of cell and often touching R_{4+5} and M, or with 1 extremely large and broad hyaline area [fused #14 and 15], sometimes partially divided; usually (9 of 10 specimens) with anterior hyaline spot [#48] near midlength, and often also with 1 to several additional tiny hyaline spots on or near anterior and/or posterior margins. Distally cell r_1 with 2–3 small marginal hyaline spots [#6 and additional spots] (1 wing of 1 specimen with 1 broad spot), occasionally (2 specimens) also with 1 small more proximal posterior hyaline spot. Cell r_{2+3} with 2 large marginal hyaline marks [#10, #11], brown area between them sometimes pale and diffuse, both extending to vein R_{4+5}. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned with either apical mark in cell r_{2+3} or between them; with 2 or rarely 1 posterior hyaline spots aligned with hyaline mark(s) in cell m; and with 2 small ovoid marginal or submarginal hyaline spots [#18, #18A], rarely with spots connected away from margin to form C-shaped mark or anterior spot [#18A] absent (1 Ciudad Mendoza ♀). Cell m with basal or usually subbasal hyaline spot [#49] near midlength of dm-cu; and with 3 large ovoid hyaline spots, 2 marginal [#27, #29] and 1 anteromedial spot [fused #26, #26A], usually diffusely separated or partially fused, especially anteromedial and proximal spots, to form large irregular mark. Cell br with large subbasal hyaline spot [#12]. Cell bm with large circular subbasal and subapical hyaline spots [#19, #20] (3 specimens), or usually with single broad hyaline area [fused #19, #20]. Cell bcu occasionally (3 specimens) with small irregular pale brown spot in lobe. Posteromedial part of wing with very large broad hyaline areas; cell br with broad subapical hyaline spot [#13] and smaller more proximal spot [#44], occasionally connected posteriorly; cell dm with broad hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50] aligned with large hyaline area in cell cu_1, sometimes partially divided anteriorly (in 1 specimen with very narrowly separated anteromedial and anterodistal spots), anteriorly extended beyond level of r-m, nearly transverse distally; cell cu_1 with anteriorly trilobed and posteriorly bilobed mark [fusion of at least #31, #32, #33, #34, #39, #36, #36A] or more broadly fused hyaline area covering more than medial half, very broad on posterior wing margin, including 1 or usually 2 small anterior and 1 subbasal marginal or submarginal brown spots; subapical marginal hyaline spot [#37] large, reaching vein Cu_1, rarely connected anteriorly to large proximal hyaline area. Cell dm with moderate sized to large anterior subapical hyaline spot [#25?], sometimes (4 of 10 specimens) connected to proximal hyaline area, and with moderate sized posterior hyaline spot [#53] aligned with subapical mark in cell cu_1.

Abdomen: All tergites with 4 evenly spaced dark brown spots and 2 pairs of spots (more medial pair usually weak or absent on syntergite 1+2) or pair of narrow posterolateral dark brown bands on posterior margin, on tergites 3–5 L-shaped but lateral margin yellow anteriorly, bands separated medially; more anterior spots not connected to posterior spots or bands.

Female terminalia: Oviscape entirely dark brown or occasionally with base and extreme apex orange; length 1.10–1.50 mm. Aculeus (Fig. 170) 0.74 mm long, 2.47 times as long as wide, without scales dorsally or ventrally on medial membrane; tip evenly curved basolaterally, margin with minute serrations extending to lateral lobe; lobed part very narrow, less than 1/3 as wide as aculeus, and short (0.37–0.43 times as long as wide), with narrow medial concavity (about as broad and deep as medial lobe) and 4 pairs of small lobes; medial lobes convex; sublateral lobe larger than submedial lobe, both step-like; lateral lobe acute, directed distally, separated from sublateral lobe by gap as deep and broad as lateral lobe. Spermathecae subspherical, with slender, convoluted neck and large cylindrical basal apodeme (Fig. 191).

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on curved lobe, lateral prensiseta small to minute, less than one-fourth as wide as medial prensiseta, acute, and orange brown (similar in color to medial surstylus, not dark brown like medial prensiseta).

Distribution. Mexico (Mexico, Morelos, Veracruz). The specimens for which elevation data were provided by the collectors were taken between 2400–2900 m.

Type data. Holotype ♂ (IMZ), MEXICO: "senza indicazione de località" [unspecified locality]. The holotype has labels with "N.A.", "1214", and, in Giglio-Tos' writing, "Blepharoneura regina Giglio-Tos ♂".

Other specimens examined. MEXICO: México: Atlacomulco, 22 mi N, 8100 ft. [2470 m], 18 Aug 1954, J. G. Chillcott, 1♀ (CNC USNMENT00213844). Morelos: Lagunas de Zempoala, 9400 ft. [2866 m], 22 Aug 1969, G. W. Byers, 2♀ (UKaL USNM USNMENT00213845, USNMENT00213847) 1♀ (USNM USNMENT00213846); Lagunas de Zempoala, emerged 13 Mar - 11 Apr 1993 reared ex fruit of *Microsechium helleri* (Peyr.) Cogn. collected 5 Nov 1992, M. A. Condon, 1♂ (IEXV USNMENT00213381) 1♀ (USNM USNMENT00213380). Veracruz: Ciudad Mendoza, 27 km W of, 13 Aug 1987, Brown & Powell, 1♂1♀ (UCB USNMENT00213825–26) 1♀ (UCB USNMENT00213827).

Biology. This species was reared from fruit of *Microsechium helleri* (Peyr.) Cogn. in central Mexico. Larvae found in fruit of the same plant in 1991 at Lagunas de Zempoala (Norrbom plant voucher 91M18), but not reared, fed on developing seeds and associated tissues (Figs. 206–208).

***Blepharoneura rupta* (Wulp)**
Figs. 4, 60, 161, 203

Hexachaeta rupta Wulp 1899: 402 [in key], 404 [description]; Foote 1965: 237 [type data and lectotype designation].
Blepharoneura rupta: Hendel 1914: 20 [in key], 21 [in catalog]; Aczél 1950: 198 [in catalog]; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 106 [in catalog].

Diagnosis. This species is among the *Blepharoneura* species with the apical part of the wing obliquely banded, without marginal hyaline marks in cell r_{2+3}. It differs from the other obliquely banded species by the following combination of characters: vertex with brown spot or band surrounding medial vertical seta; scutum without vittae or with 3 vittae or anterior spots, including unpaired medial one; anepisternum without brown markings; pterostigma without subapical hyaline spot; cell m with proximal hyaline mark extending at least to vein R_{4+5}, distal mark often not extended beyond vein M; subapical hyaline band not extended anteriorly to vein R_{2+3} nor with aligned posterior spot in cell r_1 and not extended proximally beyond the apex of the proximal hyaline band originating in cell m; and abdominal tergites 3–5 with brown mark extended to lateral margin or with small separate spot on margin. The aculeus is similar to those of *B. cornelli* and *furcifer*, with minutely serrate, digitate lateral and broad slanted sublateral lobes, a step-like submedial lobe, and unpaired truncate or convex medial lobe.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta or reaching it. Small dark brown area surrounding and mostly posterior or posteromesal to medial vertical seta. Medial occipital sclerite with or without pair of faint brown submedial vittae on ventral half. Occipital suture narrowly dark orange to brown.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, entirely yellow (Rio Naranjo ♀) or with narrow unpaired presutural medial red brown vitta extending to or beyond transverse suture, and presutural pair of short comma-shaped red brown vittae or spots aligned with medial corner of postpronotal lobe; posterior margin usually (2 of 3 specimens) with broad dark brown band or triangular mark. Scutellum, mediotergite and pleuron entirely yellow. Subscutellum entirely yellow (Rio Naranjo) or with small brown spot or line dorsolaterally (USNM paralectotype, Stann Creek). Basalare entirely yellow. Dorsocentral seta aligned with or slightly posterior to postalar seta.

Legs: Entirely yellow.

Wing (Figs. 4, 60): Length 5.20–6.40 mm, width 2.50–3.15 mm, ratio 1.93–2.08. Crossvein r-m at 0.52–0.57 distance from bm-cu to dm-cu. Cell c with 2 ovoid hyaline spots, basal spot and sometimes distal spot not reaching costa and/or subcosta; medial brown area as dark as area of cell r_1 posterior to pterostigma, with medial, streak-like pale area, dark brown medial area as broad or broader than both spots. Pterostigma without subapical hyaline spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots or only with spot in r_1 posterior to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot in r_{2+3} [#8] forming acute triangular mark, usually extended to R_{4+5}; no aligned spot present in r_{4+5}; cell r_{2+3} sometimes (1 of 4 specimens) with second, slightly more distal, small hyaline spot [#9], extending from R_{2+3} more than halfway to R_{4+5}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small. Distally cell r_1 without hyaline spots [#6]. Cell r_{2+3} without marginal hyaline marks but with 2 large spots [apical parts of #10, #11] or 1 very broad hyaline area posteriorly bordering R_{4+5}, proximal spot isolated or connected to band in cell r_{4+5}. Cell r_{4+5} with hyaline band from posteroapical margin, extending parallel to costa into cell r_{2+3}, as broad as to much broader than marginal brown area. Cell m with 2 elongate marginal hyaline marks, proximal mark [fused #26A, #26, #27] aligned with hyaline band in cell r_{4+5} forming band extending at least to vein R_{4+5}, distal mark [#29] isolated and ending at vein M or connected to proximal mark along posterior or both sides of vein M. Cell br with subbasal hyaline spot [#12]. Cell bm without subbasal hyaline spot [#19], with small circular subapical spot [#20] only. Posteromedial part of wing with 2–3 hyaline marks; cell br with subapical hyaline spot [#13] aligned and connected with anterior spot in cell dm [#21] to form narrow band; cell dm with 2 narrowly separated posteromedial spots or 1 broad spot [#22, #23?, #24], proximal part (or spot) sometimes connected to anterior mark, aligned with proximal part of Y- or H-shaped mark in cell cu_1; cell cu_1 with Y-shaped hyaline mark [fusion of #32, #33, #36], its proximal arm aligned with and sometimes connected to spot [fused #34, #39] across apex of vein A_1+Cu_2 to form H-shaped mark, isolating 1–2 brown spots; subapical marginal hyaline mark [#37] moderate to large. Cell dm with subapical hyaline spot [#25] moderate sized (USNM paralectotype) or usually absent.

Abdomen: All tergites with pair of broad irregular dark brown markings; mark on each tergite extended along posterior margin to lateral margin of tergite except on tergite 5 which has isolated posterolateral spot; markings on tergites 3–5 bimodal or with large anterior yellow spot within them; markings broadly separated medially by slightly tapering, nearly straight margined yellow area.

Female terminalia: Oviscape entirely dark brown; length 0.95–1.00 mm. Aculeus (Fig. 161) 0.78–0.81 mm long, 1.98 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip slightly flared outward basolaterally, short triangular (lobed part 0.40–0.49 times as long as wide), with moderately long, broad truncate or blunt medial lobe and 3 pairs of lobes; lateral lobe large and digitiform, with minute serrations apically; sublateral lobe very broad and slanted, minutely serrate; submedial lobe small and step-like. Spermathecae subspherical, with strongly convoluted, broad sclerotized neck and with or without small cylindrical basal apodeme (similar to *B. furcifer*).

Male terminalia: Medial surstylus long and slender, prensisetae subequal, closely approximated, separated by less than width of medial prensiseta (Fig. 203).

Distribution. Lowland areas of tropical Mexico (Tabasco), Belize, and Costa Rica.

Type data. Lectotype ♀ [designated by Foote 1965: 237] (BMNH), MEXICO: Tabasco: Teapa, [17°33'N 92°57'W], Feb, H. H. Smith [examined]. The lectotype has a label with "to be the lectotype RHF" in Foote's writing. We added a lectotype label.

Other specimens examined. BELIZE: Stann Creek, 20 Jun 1969, A. Lewis, 1♂ (USNM USNMENT00213797). COSTA RICA: Guanacaste: Río Naranjo, 3 km SE, 11–20 Aug 1992, F. D. Parker, 1♀ (USU USNMENT00213532). MEXICO: Tabasco: Teapa, Mar, H. H. Smith, 1♀ paralectotype (BMNH), 1♀ paralectotype (USNM USNMENT00213796).

***Blepharoneura ruptafascia* Norrbom & Condon, new species**
Figs. 61, 162

Diagnosis. This species is among the species of *Blepharoneura* with two marginal hyaline marks in cell r_{2+3}, the more distal of which is a concave band extending across cell r_{4+5}. It differs from the other species with this type of wing marking by the following combination of characters: cell r_1 without subapical hyaline spot; proximal marginal hyaline mark in cell r_{2+3} not extending into cell r_{4+5}; and cell dm without hyaline subapical spot in anterior half. The aculeus tip is short and broad, with 3 pairs of step-like lobes and a small weakly trilobed medial lobe. The lateral lobe forms nearly a right angle, unlike in *B. unifasciata* in which the lobe is rounded.

Description. Head: Dark brown area on ocellar tubercle extended to level of postocellar seta. Occipital suture narrowly dark brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of red brown vittae; submedial pair extended from anterior margin to or almost to transverse suture and with pair of spots on anterior half of postsutural part of scutum; sublateral vitta extended from margin with postpronotal lobe halfway to transverse suture and with presutural spot on transverse suture; posterior margin with pair of rounded dark brown marks [holotype is pinned in this area, but spots probably well separated]. Notopleuron and scutellum entirely yellow. Pleuron entirely yellow. Subscutellum and mediotergite with pair of narrow brown vittae. Basalare entirely yellow. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur with dark brown spot on margin of anteroventral apical ridge, hind femur sometimes with similar but smaller and paler mark. Hind tibia slightly darker, orange.

Wing (Fig. 61): Length 7.33 mm, width 3.86 mm, ratio 1.90. Crossvein r-m at 0.57 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline spots, both reaching costa and subcosta; medial brown area paler than area of cell r_1 posterior to pterostigma, narrower than both hyaline spots. Pterostigma with large hyaline subapical spot [#3], reaching or almost reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spot in r_{2+3} [#8] forming acute triangular to nipple-shaped mark, with spot [#14] in cell r_{4+5} slightly distal to it, and sometimes (1 wing) with spot in r_{2+3} bilobed posteriorly [fused spot #9?]; cell r_{4+5} spot [#14] barely touching R_{4+5} and extended halfway across cell, and with medial hyaline spot [#15] very small and slightly distal to anterior end of dm-cu. Distally cell r_1 without marginal [#6] or posterior hyaline spots. Cell r_{2+3} with 2 elongate marginal hyaline marks, proximal mark [#10] ending at vein R_{4+5}, distal mark [#11] connected with hyaline marks in r_{4+5} [including #18] forming concave band extending to margin of r_{4+5}. Cell m with 2 elongate marginal hyaline marks [fused #26 and #27, #29], neither extending into cell r_{4+5}. Cell br with subbasal hyaline spot [#12]. Cell bm with only circular subapical hyaline spot [#20]. Posteromedial part of wing with large inverted Y-shaped hyaline mark; proximal part [aligned and connected #13, #21, #22, #32, #34, #39] extending from cell br subapically, across cells dm and cu_1 subbasally, and across apex of vein A_1+Cu_2, broadly connected posteriorly in cell dm to distal band [fused #24, #33, #36] extending from posteromedially in cell dm to posterior wing margin; cell cu_1 with subapical marginal hyaline mark [#37] moderate to large. Cell dm without subapical hyaline spot [#25].

Abdomen: Mostly yellow. Syntergite 1+2 with 1 pair of small brown submedial spots not reaching lateral or posterior margins. Tergites 3–5 with pair of broad dark brown submedial vittae or rows of spots, not extended to lateral margin, but each tergite also with small posterolateral spot on margin; submedial spots solid brown, without yellow spots within them but sometimes narrowed or broken into separate anterior and posterior spots, well separated medially, but with irregular margins.

Female terminalia: Oviscape entirely dark brown; length 1.30 mm. Aculeus (Fig. 162) 0.89 mm long, 1.93 times as long as wide, with acute scales dorsally and ventrally on medial membrane; tip angular basolaterally, short triangular (lobed part 0.23 times as long as wide), with small, weakly trilobed medial lobe and 3 pairs of

step-like lobes; sublateral lobe larger than submedial lobe, gap between them broad and transverse, submedial and medial lobe together almost 1/3 as wide as distance between apices of sublateral lobes; lateral lobe forming nearly 90° angle; lobes separated by deep gaps, lateral gap 1.04 times as long as wide. Spermathecae subspherical, with slender, slightly convoluted, sclerotized neck and with short cylindrical basal apodeme.

Distribution. Ecuador. The holotype was collected at 340 m elevation.

Type data. Holotype ♀ (UKaL USNMENT00213922), ECUADOR: Napo: Santa Cecilia, 340 m, 8 Jun - 1 Aug 1968, W. G. Saul.

Etymology. The name of this species is a Latin noun referring to the proximal hyaline marks in cells r_{2+3} and m which form an incomplete or broken second subapical band.

Remarks. A male from Costa Rica (Alajuela: Upala, 20 km S of, 5–10 Oct 1990, F. D. Parker (USU USNMENT00213921)) may be *B. ruptafascia* or a similar undescribed species. It differs as follows: scutum without postsutural submedial brown spots and with pair of spots on posterior margin faint and diffuse; notopleuron with small brown areas surrounding anterior and posterior setae; scutellum with pair of diffuse submedial red brown spots; subscutellum yellow except small, narrow brown mark on dorsal margin laterally, mediotergite entirely yellow; pterostigma with hyaline subapical spot [#3] smaller, not reaching R_1; cell r_1 basally with small hyaline spot posterior to apex of vein Sc; radial cells medially with hyaline spots separated, marks in cell r_1 [#5] and r_{2+3} not reaching R_{2+3}, spot in r_{2+3} [#8 or #9] nearly aligned with mark in r_1 and spot in r_{4+5} [#14] in one wing and slightly distal to them in other; cell r_{4+5} with medial hyaline spot [#15] moderate sized and aligned with anterior end of dm-cu; cell r_{2+3} with distal hyaline mark [#11] not reaching margin in one wing; cell m on 1 wing with distal spot [#29] elongate but not reaching margin; cell bm with broad ovoid medial hyaline spot [fused #19 and #20?]; cell cu_1 with subapical marginal hyaline mark [#37] small. Further specimens and data are needed to clarify the status of this male.

Blepharoneura septemdigitata Norrbom & Condon, new species

Figs. 62, 93, 119–120, 163

Diagnosis. This species, *B. ruptafascia*, *furcifer*, an undescribed species (see *B.* sp. nr. *furcifer*) and some specimens of *B. quadristriata* and *macwilliamsae* differ from other *Blepharoneura* species in having two marginal hyaline marks in cell r_{2+3}, the more distal of which forms a concave band ending on the posteroapical margin of cell r_{4+5}. *B. septemdigitata* differs from the undescribed species and *B. ruptafascia* in having the proximal marginal hyaline mark in cell r_{2+3} extended into cell r_{4+5} (it connects to the proximal hyaline mark in cell m to form a complete band only in some specimens of this species and *B. furcifer*); cell dm with two hyaline marks in basal 2/3; and cell cu_1 with medial hyaline mark Y-shaped. It differs from *B. macwilliamsae* and *quadristriata* in having either three or no anterior brown spots or vittae on the scutum (there are 2 or 4 in the other species) and from the latter species in having yellow spots within the brown abdominal markings. It differs from *B. furcifer* in the markings of cell c (see key), but is most reliably distinguished from it by aculeus shape. The aculeus differs from all other *Blepharoneura* species in having 7 digitiform lobes separated by deep, narrow gaps. That of *B. lutea* is similar but differs in having a medial apical concavity rather than a projecting medial lobe. In *B. furcifer* the submedial lobe is step-like and not deeply separated from the medial lobe.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta or reaching it. Often (4 of 7 specimens) with very small ovoid dark brown area surrounding medial vertical seta. Medial occipital sclerite with pair of faint brown submedial vittae on ventral half. Occipital suture narrowly orange brown to red brown.

Thorax (Fig. 93): Scutum nonmicrotrichose except lateral third anterior to transverse suture (this area sometimes sparsely microtrichose), and lateral margin and posterior to dorsocentral setae on postsutural part; scutum usually entirely orange (5 of 7 specimens), in 2 males posterior margin with pair of red brown marks

or bimodal transverse mark, fainter medially, latter male also with narrow unpaired presutural medial red brown vitta, extended to transverse suture, and pair of presutural comma-shaped red brown marks aligned with medial corner of postpronotal lobe but not reaching it. Scutellum, subscutellum, mediotergite, pleuron and basalare entirely yellow. Dorsocentral seta aligned with or posterior to postalar seta or (1 ♀) slightly anterior to postalar seta.

Legs: Entirely yellow, occasionally mid femur with extreme margin of anteroventral apical ridge dark red brown.

Wing (Fig. 62): Length 7.00–7.55 mm, width 3.10–3.66 mm, ratio 1.97–2.09. Crossvein r-m at 0.48–0.52 distance from bm-cu to dm-cu. Cell c usually with 1 goggles-shaped hyaline area, more rounded than rectangular basally and distally and narrower medially, in Bolivian specimen [USNMENT00056539] with narrow medial brown area separating 2 rounded hyaline spots; hyaline area(s) usually narrowly separated from costa by elongate marginal pale brown area. Posteromedial and sometimes anteromedial parts of brown area(s) as dark as area of cell r_1 posterior to pterostigma. Pterostigma with hyaline subapical spot [#3], small to large, often reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) usually without hyaline spots, 1 specimen with minute spot in r_1 posterior to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark in cell r_1 [#5] and usually with aligned spots in r_{2+3} [#8] and r_{4+5} [#14], usually forming acute triangular to nipple-shaped mark; spot in r_{2+3} rarely absent (1 wing of 1 specimen), spot in r_{4+5} sometimes absent (2 specimens) or narrowly isolated or slightly more proximal than r_1 mark, extended at most halfway across cell; cell r_{2+3} sometimes (3 specimens) with slightly more distal, small hyaline spot [#9], sometimes touching R_{2+3} or R_{4+5} (in 2 specimens touching or almost touching r_1 mark anteriorly); cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small to minute (reduced to yellowish dot in 2 specimens). Distally cell r_1 with 1 subapical marginal hyaline spot [#6]. Cell r_{2+3} with 2 elongate marginal hyaline marks, proximal mark [#10] aligned with hyaline mark in cell cell r_{4+5} forming band extending at least to middle of cell r_{4+5}, usually (except in Bolivian ♀) connected to proximal mark in cell m to form complete band, distal mark [#11] connected with hyaline marks in r_{4+5} [including #18] forming concave band extending to margin of r_{4+5}. Cell m usually with 2 marginal hyaline marks, proximal mark usually (Peruvian specimens) band [fused #26A, #26, #27] connected to posterior spot or band in cell r_{4+5}, rarely (Bolivian ♀) divided into marginal spot [#27] and elongate anteromedial spot [fused #26, #26A]) extended to vein M; distal mark [#29] usually extended to vein M but not into cell r_{4+5}, sometimes narrowly separated from proximal band or spot anteriorly. Cell br usually without subbasal spot [#12], with minute spot in 1 Peruvian male. Cell bm without subbasal spot [#19], sometimes (3 specimens) with minute subapical spot [#20]. Posteromedial part of wing with more proximal elongate hyaline band and more distal Y-shaped hyaline mark in cell cu_1 and aligned spot in cell dm; proximal band [aligned and connected #13, #21, #22, #31?] extended from subapically in cell br into cell cu_1, usually broader in cell dm, in 1 specimen interrupted anteriorly in cell dm, occasionally (1 wing of 3 specimens) with part in cell cu_1 [#31?] aligned slightly more proximal; distal mark including large Y-shaped hyaline mark medially in cell cu_1 [fused #32?, #33, #36] and aligned large posteromedial hyaline spot in cell dm [#23 and/or #24] (spot variously aligned with middle, with proximal branch and middle, or distal branch and middle of Y-shaped mark) isolating or nearly isolating brown mark anteriorly in cell cu_1; cell cu_1 with marginal hyaline mark on apex of vein A_1+Cu_2 [fused #34, #39] isolated; subapical marginal hyaline mark [#37] moderate to large. Cell dm with subapical spot [#25] small and hyaline (1 specimen) or usually faint, pale brown, sometimes indistinct.

Abdomen (Figs. 119–120): Yellow on most of syntergite 1+2 and medially on all tergites (forming broad, tapering, straight margined medial vitta); lateral part of tergites, including margin, dark brown with narrow yellow spots, each side minimally with 2 short anterior spots on tergite 3 and 1 on tergite 4 (Fig. 106), maximally with 2 rows of elongate spots on tergites 3–5 (Fig. 105).

Female terminalia: Oviscape entirely dark brown; length 1.40 mm. Aculeus (Fig. 163) 0.94–0.95 mm long, 1.86–1.92 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip

slightly flared outward basolaterally, short and broad (lobed part 0.32–0.37 times as long as wide), with 7 digitiform, minutely serrate lobes separated by deep, narrow gaps; unpaired medial lobe almost twice as broad but only slightly longer than submedial lobe; lateral lobe projecting, moderately broad and blunt; sublateral lobe very broad, slanted. 8th sternite usually with pair of setulae on medial apical corner. Spermathecae subspherical, with strongly convoluted, broad sclerotized neck and with or without small cylindrical basal apodeme (similar to *B. furcifer*).

Male terminalia: Medial surstylus long and slender, prensisetae subequal, closely approximated, separated by less than width of medial prensiseta.

Distribution. Low to middle elevation areas (250–750 m) of northeastern Bolivia and eastern Peru.

Type data. Holotype ♀ (USNM USNMENT00213937), PERU: Madre de Dios: Manu, Río Manu, 5 km E of Pakitza, Aguajal, 19 Sep 1988, A. Freidberg. Paratypes: BOLIVIA: La Paz: 5 km W of Mapiri, Arroyo Tuhiri, 15°17.8'S 68°15.6'W, 750 m, 19 Mar 2001, S. D. Gaimari, 1♀ (USNM USNMENT00056539). PERU: Madre de Dios: Manu, Río Manu, Pakitza, 12°07'S 70°58'W, 250 m, 9–23 Sep 1988, A. Freidberg, 1♂ (USNM USNMENT00213938) 1♂1♀ (TAUI USNMENT00213939–40); Manu, near Salvación, Erika, 550 m, 5–6 Sep 1988, A. Freidberg, 2♂ (USNM USNMENT00054208, USNMENT00213936).

Etymology. The name of this species is an adjective referring to the seven digitate lobes of the aculeus tip.

Blepharoneura sinepuncta Norrbom & Condon, new species

Figs. 63, 144

Diagnosis. This species, *B. splendida*, *punctistigma*, and *aspiculosa* differ from other *Blepharoneura* species in having the thoracic pleuron largely brown, the apical fourth or more of the hind femur dark brown, and the distal part of the wing with oblique bands. *Blepharoneura sinepuncta* differs from the other three species in having the submedial scutal vittae broadly connected to the marks on the posterior margin (they are rarely narrowly connected in *B. puntistigma* and *splendida*), and it further differs from *B. punctistigma* and *aspiculosa* by its lack of a subapical hyaline spot in the pterostigma and its markings in cell dm (subapical spot [#25] absent or aligned with or fused to posteromedial spot [#24]). The scutal microtrichial pattern varies, but at least the anterior 2/3 of the presutural part lateral to the submedial vitta is microtrichose, unlike in *B. splendida*. The aculeus tip is more elongate than in *B. splendida* and *punctistigma*, the gaps between the lobes are deeper than in *B. aspiculosa*, and the medial lobe is slightly concave or notched unlike all three species.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta or reaching it. Medial vertical seta in yellow area. Medial occipital sclerite with pair of red brown to dark brown submedial vittae on ventral half, sometimes connected. Occipital suture narrowly dark brown, on lateral side bordered by variably shaped brown area, extending as band or triangular mark towards postocular setae, sometimes (1 specimen) reaching eye margin and including lateral vertical seta or (2 specimens) with narrow brown area along eye.

Thorax: Scutum microtrichose at least laterally, posterior to dorsocentral seta, and on anterior 2/3 of presutural part lateral to submedial vitta, sometimes more extensively or mostly microtrichose [obscured or damaged on some specimens and full extent difficult to determine]; scutum also with 2 pairs of dark brown vittae; submedial vitta uninterrupted and connected to mark on posterior margin; sublateral vitta at most narrowly interrupted at transverse suture, narrowly separated from or occasionally (2 specimens) connected to mark on posterior margin; posterior margin with 1 brown mark, narrowed medially. Notopleuron dark brown except narrowly on anterodorsal margin. Small brown spot anterior to postsutural supra-alar seta usually absent, small and faint in 2 specimens. Brown vitta anterior to postalar seta and brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of submedial brown marks, sometimes extended to basal margin, or with single usually inverted U-shaped medial mark; side with small to moderately large brown spot or linear or L-shaped mark on or near ventrobasal margin. Subscutellum and mediotergite mostly

brown except narrow medial vitta and dorsolateral corner of mediotergite usually yellow or orange, or with single very broad or pair of dark brown vittae and ventral half of lateral margin of mediotergite also narrowly brown. Pleuron mostly dark brown, yellow only on propleuron, anterior margin of anepisternum and usually broadly bordering phragma, all or most of katepimeron, greater ampulla, and often dorsal margins of anepimeron, katatergite or anatergite. Basalare brown. Dorsocentral seta aligned with or usually slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur sometimes with single ventral or separate anteroventral and posteroventral brown marks on apical 1/5–1/4. Hind femur with entire apical 1/4–2/3 dark brown.

Wing (Fig. 63): Length 6.35–7.35 mm, width 3.05–3.70 mm, ratio 1.86–2.09. Crossvein r-m at 0.52–0.57 distance from bm-cu to dm-cu. Cell c with 2 or occasionally 3 hyaline spots, basal spot broad and rectangular, reaching costa and subcosta, distal spot slightly to distinctly smaller, rectangular or constricted medially or occasionally divided into smaller semicircular anterior and posterior spots; medial brown area almost as dark as to slightly paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, slightly to distinctly narrower than basal hyaline spot, narrower or broader than distal spot. Pterostigma without subapical hyaline spot. Cell r_1 basally (proximal to apex of R_1) with 1 pale brown to hyaline spot, rarely diffuse or indistinct; cell r_{2+3} entirely dark brown or occasionally with 1 spot. Radial cells medially with tapering basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1 and aligned spots in r_{2+3} [#8] and r_{4+5} [#14] forming acute triangular mark, sometimes extended to vein M; cell r_{4+5} with hyaline spot [#15] near anterior end of dm-cu narrow but extending to vein M. Distally cell r_1 without marginal hyaline spot [#6], posteriorly often with small extension from band in cell r_{2+3}. Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending parallel to costa to vein R_{2+3} or slightly into r_1, slightly tapering anteriorly, approximately as broad as marginal brown area. Cells m and r_{4+5} with inverted V-shaped hyaline mark [fusion of at least #26A, #26, #27, #29], extending to or almost to vein R_{4+5}, both arms reaching margin in cell m. Cell br with subbasal hyaline spot [#12]. Cell bm with broad hyaline area [fused #19, #20] or large circular subapical hyaline spot [#20] only. Cell bcu rarely (1 specimen) with hyaline spot in lobe. Anal lobe hyaline except brown area from apical part of lobe of cell bcu and base of vein A_1+Cu_2 crossing apex of vein A_2. Posteromedial part of wing with 2 elongate hyaline bands, usually connected medially in cell cu_1 (except in 1 male (USNMENT00048913) in which they are broadly connected only posteriorly in cell dm) and occasionally narrowly posteriorly in cell dm; proximal band extending from subapically in cell br across cell dm and at least midway across cell cu_1 [aligned and fused #13, #21, #22, #32, possibly also #51, #52 or #23 when broad], often connected to mark across vein A_1+Cu_2 [fused #34, #39], and often broader on proximal or distal side in cell dm; part in cell br [#13] broad at least posteriorly, slightly to strongly narrowed anteriorly, sometimes not reaching vein R_{4+5}, br without more proximal hyaline spot [#44]; distal band [fusion of at least #24, #33, #36 and usually #25] usually extending from anterior side of cell dm across cell cu_1 to wing margin, in 1 specimen reaching vein M, or occasionally with anteromedial subapical hyaline spot [#25] isolated (1 specimen) or absent (1♂, USNMENT00048913); cell cu_1 with subapical marginal hyaline spot [#37] small to large, usually reaching vein Cu_1.

Abdomen: Syntergite 1+2 with pair of irregular posterolateral brown marks formed from fused submedial and sublateral spots and posterolateral band. Tergites 3–5 with pair of submedial brown spots, isolated except on tergites 3 and 5 of Zurquí male (USNMENT00048913) and pair of irregular lateral brown markings, separated medially, often very broad laterally (without or with small anterior sublateral yellow area) formed from fused or connected submedial spots, anterolateral spots, and L-shaped posterolateral bands; sublateral spots occasionally isolated on tergite 4 or especially tergite 5, anterolateral spots rarely isolated.

Female terminalia: Oviscape entirely dark brown, length 1.16–1.30 mm. Aculeus (Fig. 144) 0.65–0.70 mm long, 1.67–1.88 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, elongate triangular (lobed part 0.57–0.67 times as long as wide), with small, notched or slightly concave medial lobe and 3 pairs of step-like lobes separated by relatively deep gaps; sublateral and

submedial lobes similar in size; lateral gap 1.36–1.54 times as long as wide. Spermathecae subspherical, with straight to slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta on short lobe.

Distribution. This species is known only from Costa Rica. Where provided by collectors, the elevations of the collection sites range from 900–2200 m.

Type data. Holotype ♀ (INBio INBIO002405749), COSTA RICA: San José: San Gerardo de Dota, near Albergue Savegre, LS 389000 484200, 2200 m, 19–22 May 1997, E. Zumbado. Paratypes: COSTA RICA: Alajuela: La Garita, 900 m, 5 May 1987, C. Godoy, 1♂ (UCRSJ USNMENT00213919); Cartago: La Suiza, 7 Mar, P. Schild, 1♂ (USNM USNMENT00213916); same, 2 Mar 1924, 1♂ (USNM USNMENT00213918); same, Apr 1922, 1♀ (USNM USNMENT00213917); Heredia: Río Sucio, H. Rogers, "B.C.A. Dipt. II., Hexachaeta splendida G.Tos.", 1♂ (BMNH); San José: San Gerardo de Dota, along Río Savegre, 9°33'N 83°48'W, 2200 m, on *Cyclanthera langei* Cogn. (95CR14), 8–10 Aug 1995, M. A. Condon & A. L. Norrbom, 1♀ (USNM USNMENT00048391); San Gerardo de Dota, near Albergue Savegre, LS 389000 484200, 2200 m, 19–22 May 1997, M. A. Zumbado, 1♂ (INBio INBIO002578262); Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Mar 1995, P. Hanson, 1♂ (USNM USNMENT00048557); same, Sep 1995, 1♀ (USNM USNMENT00050130). Puntarenas: Estación Biológico Pittier, LS 330900 577400, 1670 m, 26 Sep - 5 Oct 1995, E. Navarro, 1♀ (INBio INBIO002340202).

Other specimens examined. COSTA RICA: San José: Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Aug-Sep 1994, P. Hanson, 1♂ (USNM USNMENT00048913).

Etymology. The name of this species is a Latin noun meaning without spots in reference to the absence of spots in the pterostigma and in the apical part of cell dm, which distinguishes this species from *B. aspiculosa* and *punctistigma*.

Remarks. Cells dm and cu_1 usually have a more or less H or M-shaped hyaline mark. In the La Suiza female there is an isolated hyaline spot in the apical third of dm, but it is aligned with the distal part of the larger mark that extends into cell cu_1. The non-paratype male from Zurquí has a different shape, somewhat more like an inverted V, and it also has the hyaline mark in cell r_1 extended to vein M and very broad scutal vittae and may possibly be a different species.

Biology. One adult was collected on *Cyclanthera langaei* Cogn. at San Gerardo de Dota, Costa Rica, and larvae were also found mining stems of this plant at this site in the same month (19 Aug 1995, ALN, pers. obs.), but unfortunately we were unable to rear the larvae to adults and their identity remains uncertain (also see Biology section).

***Blepharoneura splendida* Giglio-Tos**

Figs. 64–65, 184–187

Blepharoneura splendida Giglio-Tos 1893: 10; Giglio-Tos 1895: 58 [type data, additional description]; Lima & Leite 1952: 309; Norrbom *et al*. 1999: 106 [in catalog].

Hexachaeta splendida: Wulp 1899: 402 [in key], 404 [discussion]; Hendel 1914: 23 [in key, in catalog]; Aczél 1950: 195 [in catalog]; Foote 1967: 18 [in catalog].

Diagnosis. This species, *B. sinepuncta*, *punctistigma*, and *aspiculosa* differ from other *Blepharoneura* species in having the thoracic pleuron largely brown, the apical fourth or more of the hind femur dark brown, and the distal part of the wing with oblique bands. *Blepharoneura splendida* differs from *B. sinepuncta* in having the submedial scutal vittae separate from or at most narrowly connected to the marks on the posterior margin, and from *B. punctistigma* and *aspiculosa* by its markings in cell dm (subapical spot [#25] absent or aligned with or fused to posteromedial spot [#24]), its frequent lack of a subapical hyaline spot in the pterostigma, and its mostly nonmicrotrichose scutum. The aculeus tip is stouter than in *B. sinepuncta* and *aspiculosa*, with the

sublateral lobe more pronounced, and the gap between the lateral and sublateral lobes is deeper than in *B. punctistigma*.

Description. Head: Dark brown area on ocellar tubercle usually (17 of 22 specimens) extended more than half distance to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of pale brown to dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown, on lateral side bordered by variably shaped brown area extending as band or triangular mark towards postocular setae, sometimes reaching eye margin, and usually (16 of 21 specimens) including lateral vertical seta.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, with 2 pairs of dark brown vittae or rows of spots; submedial vitta narrowed or interrupted posterior to transverse suture and usually separated from mark on posterior margin (narrowly connected on at least 1 side in 3 specimens); sublateral vitta interrupted at transverse suture and usually separated from mark on posterior margin (connected in 8 of 17 specimens); posterior margin with 1 broad brown mark narrowed medially or rarely with 2 separate marks. Notopleuron entirely brown or brown except for small pale area surrounding posterior seta. Small brown spot anterior to postsutural supra-alar seta sometimes absent or faint, sometimes connected along transverse suture to lateral vitta. Brown vitta anterior to postalar seta present. Brown spot lateral to dorsolateral corner of scutellum present, connected to sublateral vitta in Costa Rican and Venezuelan specimens. Scutellum with single inverted U-shaped or inverted mushroom shaped medial brown mark extended to basal margin. Subscutellum and mediotergite with pair of dark brown vittae, on ventral half of mediotergite extended to lateral margin or with separate narrow brown mark on margin. Pleuron mostly dark brown, yellow only on propleuron, anterior margin of anepisternum and occasionally narrowly bordering phragma, all or most of katepimeron, greater ampulla, and often dorsal margins of anepimeron, katatergite or anatergite. Basalare with brown spot or entirely brown. Dorsocentral seta aligned with or slightly anterior or posterior to postalar seta.

Legs: Mostly yellow. Mid femur sometimes with anteroventral and posteroventral brown marks on apical 1/5–1/4. Hind femur with entire apical 1/4–1/2 dark brown.

Wing (Figs. 64–65): Length 5.14–6.55 mm, width 2.60–3.37 mm, ratio 1.88–2.00. Crossvein r-m at 0.51–0.56 distance from bm-cu to dm-cu. Cell c with 2 hyaline spots, basal spot broad and rectangular, reaching costa and subcosta, distal spot slightly larger to distinctly smaller, rectangular or constricted anteriorly, occasionally not reaching costa; medial brown area as dark as to distinctly paler than area of cell r_1 posterior to pterostigma, sometimes paler medially, usually broader than or as broad as basal hyaline spot, usually as broad as but sometimes narrower or broader than distal spot. Pterostigma usually without subapical hyaline spot, occasionally (6 Mexican specimens) with small to large subhyaline to pale brown spot [#3]. Cells r_1 and r_{2+3} entirely dark brown basally (proximal to apex of R_1) or only with 1 diffuse, indistinct pale brown spot posterior to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark [#5 fused with additional spot?] in cell r_1 and aligned spots in r_{2+3} [#8] and r_{4+5} [#14] (latter rarely absent) forming acute triangular mark, extended at most midway across r_{4+5}; cell r_{4+5} with hyaline spot [#15] near anterior end of dm-cu often extending to or almost to vein M, especially in Mesoamerican specimens. Cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending parallel to costa almost to or usually to vein R_{2+3} or slightly into r_1 (fused with subapical hyaline spot), sometimes constricted along vein R_{4+5} (some Mesoamerican specimens), usually slightly tapering anteriorly, approximately as broad as marginal brown area or (some Mesoamerican specimens) slightly to much broader. Cells m and r_{4+5} with inverted V-shaped hyaline mark [fusion of at least #26A, #26, #27, #29], extending to or almost to vein R_{4+5}, occasionally (1 Mexican, 1 Costa Rican specimen) connected anteriorly to most distal hyaline wing band to form 3 branched mark, both arms reaching margin in cell m. Cell br with subbasal hyaline spot [#12]. Cell bm rarely (1 wing of 1 specimen) with subbasal hyaline spot [#19], usually with only medial or subapical circular hyaline spot [#20]. Cell bcu rarely (2 specimens) with hyaline spot in lobe. Anal lobe hyaline except brown area from apical part of lobe of cell bcu and base of vein A_1+Cu_2 crossing apex of vein A_2. Posteromedial part of wing with large, usually somewhat Y-shaped hyaline mark, sometimes (more commonly in Mesoamerican

specimens) connected to mark across vein A_1+Cu_2 [fused #34, #39] to form H- or X-shaped mark or rarely (3 Venezuelan, 1 Ecuadorean specimens) with anterior distal arm in cell dm isolated or small; anterior proximal part of mark [aligned and fused #13, #21, #22, #32, possibly also #51, #52 or #23 when broad] extending from subapically in cell br across cells dm, sometimes broader on proximal or distal side especially posteriorly in cell dm; part in cell br [#13] slightly to strongly narrowed anteriorly, often (15 of 26 specimens) not reaching vein R_{4+5}, br without more proximal hyaline spot [#44]; posterior part of mark [fusion of at least #32, #33, #36] extending across cell cu_1 to wing margin; anterior distal part of mark [usually fusion of #25, #24] usually extending from anterior side of cell dm but not reaching vein M, usually broadly connected to proximal branch anteriorly and medially in cell cu_1 and occasionally (some Mesoamerican specimens) posteriorly in cell dm, or less commonly (some Venezuelan specimens) with anterior part of distal branch isolated in cell dm or constricted along vein Cu_1, rarely (1 Ecuadorean male, 1 wing of 1 Venezuelan male) reduced to small posterior hyaline area or spot in dm; cell cu_1 with subapical marginal hyaline spot [#37] small to moderately large, sometimes reaching vein Cu_1.

Abdomen: Syntergite 1+2 with pair of irregular posterolateral brown marks formed from fused submedial and sublateral spots and posterolateral band. Tergites 3–5 with pair of irregular, shallow U-shaped or W-shaped marks, separated medially, formed from connected or fused submedial, sublateral and anterolateral spots and posterolateral bands, occasionally very broad laterally (without or with small anterior sublateral yellow area) or rarely (Upala ♂) entirely brown except base of syntergite 1+2 and irregular medial vitta.

Female terminalia: Oviscape entirely dark brown, length 0.78–1.08 mm. Aculeus (Figs. 184–187) 0.58–0.83 mm long, 1.49–2.02 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip angular basolaterally, short triangular (lobed part 0.32–0.40 times as long as wide), with small, convex medial lobe and 3 pairs of step-like lobes separated by relatively deep gaps; sublateral lobe larger than submedial lobe; lateral gap 0.98–1.29 times as long as wide. Spermathecae subspherical, with straight to convoluted, slender sclerotized neck and large cylindrical basal apodeme (similar to *B. femoralis*).

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta on short lobe.

Distribution. Mexico (Nayarit, San Luis Potosí, Tamaulipas, Veracruz), Guatemala, Costa Rica, Venezuela, and Ecuador. Although *B. splendida* occurs in Costa Rica (and presumably also in the other Central American countries besides Guatemala), the male from Río Sucio, Costa Rica reported as this species by Wulp (1899) is *B. sinepuncta*. Specimens for which elevation data were provided by the collectors were taken at 480 to 1600 m.

Type data. Holotype ♀ (IMZ), MEXICO, "senza indicazione di località" [unspecified locality], [no date], A. Boucard [examined]. The holotype is a female, not a male as stated in the original description. Given the difficulty of distinguishing the sexes in the *femoralis* group because of the small size of the oviscape, there is no reason to doubt that this specimen is the holotype. It has labels with "1215" and, in Giglio-Tos' writing, "Blepharoneura splendida Giglio-Tos ♀".

Other specimens examined. COSTA RICA: Alajuela: Upala, 20 km S of, 27–31 Mar 1991, F. D. Parker, 1♂ (USU USNMENT00213872). San José: San Gerardo de Dota, 9°33'N 83°48'W, 2200 m, 7–11 Aug 1995, E. M. Fisher, 1♂ (CDFA USNMENT00104207); Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Sep 1995, P. Hanson, 1♀ (USNM USNMENT00050131). ECUADOR: Napo: Huahua Sumaco, Hollin - Loreto road, km 45, Malaise trap, 18 Dec 1989, M. & J. Wasbauer & H. Real, 1♂ (CDFA USNMENT00104209). Pichincha: Maquipucuna Biological Reserve, Malaise trap, 2–3 Aug 1998, F. G. Andrews, 1♂ (CDFA USNMENT00104208). GUATEMALA: Pochuta, Pacayal, 1000 m, Feb-Mar 1931, J. Bequaert, 1♀ (MCZ USNMENT00213874); Pochuta, Santa Emilia, 1000 m, Feb-Mar 1931, J. Bequaert, 1♂ (MCZ USNMENT00213879). Escuintla: Palín, 14°24'N 90°42'W, McPhail traps, 1992, J. López, 1♀ (USNM USNMENT00213838). Guatemala: Santa Catarina Pinula, Puerta Parada, Schuster property, 14.5572°N 90.4653°W, 1860 m, Malaise trap, 25 Mar - 1 Apr 2006, J. C. Schuster, 1♂1♀ (FSCA USNMENT00654008–09) MEXICO: Nayarit: San Blas, La Bajada, 20–21 Mar 1983, W. J. Hanson, 1♀ (USU

USNMENT00213873). San Luis Potosí: Xilitla, River 1 km E of, 600 m, 7 Jul 1990, I. Yarom, 1♀ (USNM USNMENT00213871). Tamaulipas: W of Gomez Farias, Rancho de Cielo, 3 Jul 1989, R. Jones, 1♀ (TAMU USNMENT00212642); 74 mi S of Ciudad Victoria, Gómez Farias, W of, 15 Nov 1985, P. Kovarik, R. Jones & K. Haack, 1♂ (TAMU USNMENT002126421). Veracruz: Estación de Biología Los Tuxtlas, 3 Mar 1985, A. Ibarra, 1♂ (IEXV USNMENT00213878); Estación de Biología Los Tuxtlas, El Viguia, 480 m, 17 Mar 1986, E. Ramírez, 1♂ (IEXV USNMENT00213881); Salto de Eyipantla, 21 Feb 1985, F. Arias, 1♀ (IEXV USNMENT00213877); Xalapa, 22 Feb 1998, A. Freidberg, 1♂ (TAUI USNMENT00213876). VENEZUELA: Aragua: Rancho Grande, 1100 m, 20 Mar 1946, 1♂ (AMNH USNMENT00213863); same, 3 May 1951, F. Fernandez Y., 2♂2♀ (IZAM USNMENT00213864–65, USNMENT00213867, USNMENT00213883); 1♂2♀ (USNM USNMENT00213868, USNMENT00213870, USNMENT00213882); same, 5 May 1951, 1♂ (IZAM USNMENT00213866); same, 10 Jun 1954, C. J. Rosales, 1♀ (IZAM USNMENT00213869). Monagas: Caripe, 21 July 1953, C. J. Rosales & J. R. Requena, 1♂ (IZAM USNMENT00213862).

Blepharoneura tau **Norrbom & Condon, new species**
Figs. 66, 105, 118

Blepharoneura sp. 41: Norrbom & Condon 1999: 138.

Diagnosis. This species differs from most species of *Blepharoneura* by its T-shaped abdominal pattern which is unique within the genus except for a few specimens of *B. splendida*, which differ in having the anepisternum brown medially and the apex of the hind femur brown. *B. tau* differs from other species with oblique apical bands on the wing in having the anepisternum with a dorsal brown spot, the marginal brown area in cells r_{2+3} and r_{4+5} as broad as the subapical hyaline band, cells r_{4+5} and dm without hyaline marks between crossveins r-m and dm-cu except for a short band extending across vein M, and cell cu_1 without a subapical hyaline spot. The female is unknown.

Description. Head: Dark brown area on ocellar tubercle extended to postocellar seta. Medial occipital sclerite with pair of faint brown submedial vittae on ventral half. Occipital suture narrowly dark brown. Small diffuse brown area lateral to occipital suture ventral to lateral vertical seta.

Thorax (Fig. 105): Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally; with 2 pairs of brown vittae; submedial vitta extended to transverse suture, red brown, posterior third faint; sublateral vitta red brown bordering medial corner of postpronotal lobe, continuing faintly almost to transverse suture (posterior 2/3 faint), anterior half of postsutural part faint and slightly more medial than dark brown posterior half, very narrowly separated from mark on posterior margin and extending lateral to scutellum (fused with normal spot lateral to scutellum); posterior margin with single broad triangular dark brown mark, broadest medially. Notopleuron with large dark brown spot posteriorly on lateral margin, extended to posterior seta. Short dark brown vitta extended from anterior to lateral to postsutural supra-alar seta, but well separated from lateral margin and postalar seta. Scutellum with pair of submedial brown spots on basal half of disk. Subscutellum narrowly brown laterally. Mediotergite with pair of brown vittae, yellow area between them broader than lateral yellow margin. Pleuron mostly yellow, with following brown areas: anepisternum with small spot dorsal to anterior seta; posterior third of anepimeron; dorsal third of katatergite; and most of anatergite except anterodorsal margin and posteroventral corner. Basalare entirely yellow. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur with anteroventral brown mark on apical 1/4. Hind femur with anteroventral and posteroventral brown marks on apical 1/4.

Wing (Fig. 66): Length 5.54 mm, width 2.87 mm, ratio 1.93. Crossvein r-m at 0.54 distance from bm-cu to dm-cu. Cell c with 2 hyaline spots, basal spot small, rounded or triangular, reaching subcosta, extending half distance to costa, distal spot subrectangular, reaching costa and subcosta; medial brown area slightly paler

than area in cell r_1 posterior to pterostigma, sometimes paler posteriorly, much broader than basal hyaline spot and slightly broader to slightly narrower than distal spot. Pterostigma without subapical hyaline spot [#3]. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark in cell r_1 [#5] and aligned spot in r_{2+3} [#8] forming acute triangular mark, extended to vein R_{4+5}; cell r_{4+5} without hyaline spot aligned with r_1 mark, but with posterior hyaline mark [#15?] aligned between r_1 mark and dm-cu, aligned and connected with anterior subapical hyaline mark [#25?] in cell dm forming short band. Distally cell r_1 without hyaline spots and cell r_{2+3} without marginal hyaline marks. Cell r_{4+5} with hyaline band from posteroapical margin, extending more or less parallel to costa into cell r_{2+3} reaching vein R_{2+3}, slightly tapering anteriorly, as broad as marginal brown area. Cells m and r_{4+5} with inverted V-shaped mark [fusion of at least #26A, #26, #27, #29], extending to vein R_{4+5} anteriorly and both arms reaching margin in cell m, distal arm slightly constricted along vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with only ovoid medial hyaline spot [#20]. Posteromedial part of wing with only 2 elongate hyaline marks in addition to elongate mark across apex of vein A_1+Cu_2 [fused #34, #39]; anterior proximal band [fused #13, #21, #22] extending from cell br subapically, across cell dm; and posterior distal band [fusion of at least #33, #36] extended medially across cell cu_1. Cell cu_1 without subapical marginal hyaline mark [#37].

Abdomen (Fig. 118): Dark brown except following yellow areas: basal half of syntergite 1+2 extending on lateral margin almost to posterior margin, then extending slightly medially, and somewhat T-shaped mark, with transverse medial mark subapically on syntergite 1+2, almost connected to lateral yellow area and connected medially to basal area and posteriorly to narrow, tapering, irregular margined, medial vitta extending posteriorly to tergite 5.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on moderately long lobe, lateral prensiseta subequal to medial prensiseta.

Distribution. Costa Rica. The holotype was collected at 1600 m elevation at a site bordering Braulio Carrillo National Park.

Type data. Holotype ♂ (USNM USNMENT00048626), COSTA RICA: San José: Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Malaise trap, Aug 1995, P. Hanson.

Etymology. The name of this species is a noun, the Greek letter tau, in reference to the somewhat T-shaped yellow mark on the abdomen.

***Blepharoneura thetis* Hendel**

Figs. 67–68, 94, 198–199

Blepharoneura thetis Hendel 1914: 21 [in key], 22 [description]; Aczél 1950: 198 [in catalog]; Foote 1967: 18 [in catalog]; Norrbom *et al.* 1999: 106 [in catalog].

Diagnosis. This species can be distinguished from other species of *Blepharoneura* by the following combination of characters: Anepisternum entirely yellow; scutum with pair of brown submedial vittae, extended to trapezoidal brown mark on posterior margin, but without sublateral vittae; scutellum with band or pair of transverse brown marks extending to side and to basal seta but not to basal margin; cell r_1 proximally with single relatively narrow, tapering marginal hyaline mark; cell r_{2+3} with 2 marginal hyaline marks, posterior one not connected to marginal hyaline spot in cell r_{4+5}; cell r_{4+5} with 2 small marginal hyaline spots or one bilobed mark (spots connected proximally). It is very similar to *B. fernandezi* and a probably undescribed species (see sp. nr. *thetis*), which differ in lacking brown scutellar markings and having only 1 marginal hyaline spot in cell r_{4+5}. The female is unknown.

Description. Head: Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Large brown spot surrounding medial vertical seta extended ventromesally to level of postocellar seta

[may connect to form band, medial part not visible in Nova Teutonia male, head is detached and glued to mounting card]. Occipital suture narrowly orange brown.

Thorax (Fig. 94): Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, with pair of broad dark brown submedial presutural vittae, broadest slightly anterior to level of posterior margin of postpronotal lobe, extended to posterior brown mark. Posterior margin with broad elongate trapezoidal dark brown mark, extended laterally to intra-alar seta and lateral to base of scutellum. Scutellum with complete transverse band (Nova Teutonia ♂) or pair of irregular, transverse, lateral brown marks (holotype) including basal marginal seta but not extending to basal margin, continuing (at least in Nova Teutonia ♂) on side to ventral margin (but ventrobasal corner yellow). Subscutellum yellow. Mediotergite with pair of broad, narrowly separated red brown vittae. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta.

Legs: Entirely yellow.

Wing (Figs. 67–68): Length 5.80–5.94 mm, width 2.90–3.07 mm, ratio 1.94–2.00. Crossvein r-m at 0.55–0.57 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area slightly paler than area of cell r_1 posterior to pterostigma, sometimes fainter posteriorly, and approximately as broad as to slightly narrower than hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots except for minute spot in r_1 posterior to apex of vein Sc. Radial cells medially with tapering basal marginal hyaline mark in cell r_1 [#5] and aligned spot in r_{2+3} [#8] forming acute triangular to nipple-shaped mark, extending at least to R_{4+5} and sometimes into r_{4+5}, but spot in cell r_{4+5} [#14] sometimes slightly more distal; spot in r_{4+5} [#14] touching R_{4+5} but extended less than halfway across cell; cell r_{2+3} with more distal moderately large hyaline spot [#9], touching R_{4+5} and R_{2+3}; cell r_{4+5} with medial hyaline spot [#15] near dm-cu small. Distally cell r_1 with 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 elongate marginal hyaline marks [#10, 11], both extending to vein R_{4+5}. Cell r_{4+5} with small hyaline spot [#16] on anterior margin aligned between marginal marks in cell r_{2+3}, and with 2 small marginal hyaline spots [#18, 18A], on right wing of Nova Teutonia male connected on proximal ends. Cell m with 3 small hyaline spots, 2 marginal [#27, 29] and 1 anteromedial [#26 and/or #26A], none extended to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with small circular subbasal and larger circular subapical spots [#19, #20]. Posteromedial part of wing with hyaline spots mostly isolated; cell br with subapical spot [#13] and usually (except 1 wing of Nova Teutonia ♂) with smaller more proximal posterior spot [#44]; cell dm with subbasal hyaline band [fused #51, #52] aligned or partially aligned with more proximal spot in cell br [#44] and proximal anterior spot [#31] in cell cu_1 (when latter spots present) sometimes (Nova Teutonia ♂) narrowly connected anteriorly or posteriorly to more distal spots in dm; cell dm also usually (except 1 wing of Nova Teutonia ♂) with anterior medial spot [#21] aligned with subapical spot [#13] in cell br, and with broad posteromedial spot [fused #22, #23, #24]; cell cu_1 medially sometimes (holotype) with 3 anterior hyaline spots [#31, #32, #33] and 2 marginal spots, medial anterior spot [#32] elongate and almost connected to marginal spot, or (Nova Teutonia ♂) with or without proximal anterior spot [#31] and with 2 distal anterior spots [#32, #33] fused with medial marginal spot [#36] to form Y-shaped mark aligned with posteromedial spot in cell dm; proximal marginal spot [fused #34, #39] across apex of vein A_1+Cu_2 isolated; medial marginal mark (or posterior part of Y-shaped mark) partially divided and relatively broad [fused #36, #36A?] (holotype) or narrower and undivided [#36 only] (Nova Teutonia ♂); subapical marginal hyaline mark [#37] small. Cell dm with subapical hyaline spot [#25] moderate sized, not extended to vein M.

Abdomen: All tergites with pair of broad dark brown markings forming irregular vittae; mark on each tergite extended broadly along posterior margin to lateral margin of tergite; spots broadly separated medially by tapering, nearly straight margined yellow area; brown spots solid except for 1 small anterior yellow spot in spots on tergites 3–5.

Male terminalia: Medial surstylus with prensisetae subequal, separated by width or slightly more than width of medial prensiseta, medial prensiseta on short lobe (Figs. 198–199).

Distribution. Brazil (Santa Catarina, Rio Grande do Sul).

Type data. Holotype ♂ (NMW), BRAZIL: Rio Grande do Sul, [no date], Stieglmayer [examined]. The holotype was not marked as such, but it has a label with "Blepharoneura thetis H." in Hendel's writing. It is a holotype by monotypy, as Hendel stated that he examined just one male specimen. We added a holotype label.

Other specimens examined. BRAZIL: Santa Catarina: Nova Teutonia, 27°11'S 52°23'W, 2 Jan 1953, F. Plaumann, 1♂ (BMNH USNMENT00213840).

Blepharoneura* species near *thetis

Figs. 69, 88

Diagnosis. This species can be distinguished from other species of *Blepharoneura* by the following combination of characters: Anepisternum and scutellum entirely yellow; scutum with pair of brown submedial vittae and broad triangular brown mark on posterior margin, but without sublateral vittae; cell r_1 proximally with single relatively narrow, tapering marginal hyaline mark; cell r_{2+3} with 2 marginal hyaline marks, posterior one not connected to marginal hyaline spot in cell r_{4+5}; cell r_{4+5} with single posterior marginal hyaline spot. It is very similar to *B. thetis*, which differs in having brown scutellar markings and 2 marginal hyaline spots or a bilobed spot in cell r_{4+5}, and *B. fernandezi*, which lacks the brown mark on the posterior margin of the scutum and brown vittae on the mediotergite. The female is unknown.

Description. Head (Fig. 88): Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Large brown spot surrounding medial vertical seta extended ventromesally to level of postocellar seta. Occipital suture narrowly dark brown.

Thorax: Scutum nonmicrotrichose except posterior to dorsocentral seta and laterally, with pair of broad dark brown submedial presutural vittae, broadly interrupted at transverse suture but with short postsutural part connected to posterior brown mark. Posterior margin with broad elongate triangular dark brown mark, extended faintly lateral to base of scutellum. Scutellum entirely yellow. Subscutellum yellow. Mediotergite with pair of broad, narrowly separated red brown vittae. Pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned slightly posterior to postalar seta.

Legs: Entirely yellow.

Wing (Fig. 69): Length 5.62 mm, width 2.90 mm, ratio 1.94. Crossvein r-m at 0.58 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area slightly paler than area of cell r_1 posterior to pterostigma, fainter anteriorly, and approximately as broad as hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark in cell r_1 [#5] and with aligned spots in r_{2+3} [#8] and r_{4+5} [#14], sometimes forming acute triangular to nipple-shaped mark, but spot in r_{2+3} sometimes not extending to R_{2+3}; cell r_{4+5} spot [#14] touching R_{4+5} but extended less than halfway across cell; cell r_{2+3} with more distal moderately large hyaline spot [#9], touching R_{4+5} but not R_{2+3}; cell r_{4+5} with medial hyaline spot [#15] near dm-cu small. Distally cell r_1 with 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 elongate marginal hyaline marks [#10, 11], both extending to vein R_{4+5}. Cell r_{4+5} with small hyaline spot [#16] on anterior margin aligned between marginal marks in cell r_{2+3}, and with 1 moderately large, slightly elongate, obliquely anteriorly directed, marginal hyaline spot [#18] posteriorly, touching apex of vein M. Cell m with 3 small hyaline spots, 2 marginal [#27, 29] and 1 anteromedial [#26 and/or #26A], none extended to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Posteromedial part of wing with hyaline spots mostly isolated; cell br with subapical spot [#13] and sometimes (1 wing) with smaller more proximal posterior spot [#44]; cell dm with subbasal hyaline band [fused #51, #52] aligned with more proximal spot in cell br [#44] (if present) and proximal anterior spot spot [#31] in cell cu_1; dm also with small anterior medial spot [#21] aligned or partially aligned with subapical spot [#13] in cell br and with broad posteromedial spot [fused #22, #23, #24] or (1 wing) with these spots connected to form L-shaped mark; cell cu_1 medially with 3 anterior hyaline spots [#31,

#32, #33] and 2 marginal spots [fused #34, #39; #36], proximal anterior spot [#31] small, aligned with subbasal band in br, distal anterior spots [#32, #33] aligned with posteromedial spot in cell br, distal spot [#33] sometimes (1 wing) fused to medial marginal spot [#36] to form band; proximal marginal spot [fused #34, #39] across apex of vein A_1+Cu_2 isolated; subapical marginal hyaline mark [#37] small. Cell dm with subapical hyaline spot [#25] moderate sized, not extended to vein M.

Abdomen: Mostly yellow. Syntergite 1+2 with pair of small, faint brown sublateral spots, not reaching lateral or posterior margins. Tergites 3–5 with pair of broad dark brown spots, forming irregular vittae; spot on each tergite extended narrowly along posterior margin to lateral margin of tergite; spots broadly separated medially by tapering, straight margined yellow area; brown spots solid except for 1 small anterior yellow spot in spot on tergite 5.

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on long lobe.

Specimens examined. BOLIVIA: La Paz: 5 km W of Mapiri, Arroyo Tuhiri, 15°17.8'S 68°15.6'W, 750 m, 18 Mar 2001, S. D. Gaimari, 1♂ (USNM USNMENT00056566).

Remarks. The single male examined probably represents an undescribed species, but we are reluctant to formally name it as no female specimens that can be associated with it or *B. thetis* are currently available.

Blepharoneura unifasciata Norrbom & Condon, new species

Figs. 70, 164

Diagnosis. This species differs from other species of *Blepharoneura* with the distal part of the wing banded in having only a single marginal hyaline mark in cell r_{2+3}, and that mark broadly touching the costal margin in r_{2+3} and extending from the apex of vein R_{2+3} to the apex of vein M. Other useful diagnostic characters include: scutellum without brown markings; pterostigma with subapical hyaline spot; cell r_1 without subapical hyaline spot; cell dm without hyaline subapical spot in anterior half; and abdominal tergites 3–5 with pair of broad dark brown submedial vittae and separate small posterolateral spot. The aculeus tip is very short and broad. It resembles those of *B. ruptafascia*, *bidigitata* and *hirsuta*, but the lateral lobe is rounded unlike *B. ruptafascia*, but not digitate as in *B. bidigitata* and *hirsuta*.

Description. Head: Dark brown area on ocellar tubercle extended more than half distance to postocellar seta. Occipital suture narrowly dark brown.

Thorax: Scutum entirely microtrichose, with 1 submedial pair of dark brown vittae from anterior margin halfway to transverse suture; posterior margin with pair of well separated rounded dark brown marks. Scutellum, subscutellum, mediotergite and pleuron entirely yellow. Basalare entirely yellow. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur with dark red brown spot on margin of anteroventral apical ridge, hind femur with similar but smaller and paler mark. Hind tibia slightly darker, orange.

Wing (Fig. 70): Length 7.43 mm, width 3.76 mm, ratio 1.97. Crossvein r-m at 0.48 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline spots, both reaching costa and subcosta; medial brown area faint anteriorly, paler than area of cell r_1 posterior to pterostigma, narrower than both hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) without hyaline spots. Radial cells medially with tapering basal marginal hyaline mark [#5] in cell r_1 and aligned spots in r_{2+3} [#8] and r_{4+5} [#14] forming acute triangular to nipple-shaped mark, extended slightly more than halfway across cell r_{4+5}; cell r_{2+3} with more distal small hyaline spot [#9], touching R_{4+5} and touching or almost touching R_{2+3}; cell r_{4+5} with medial hyaline spot [#15] near anterior end of dm-cu small. Distally cell r_1 without marginal [#6] or posterior hyaline spots. Cells r_{2+3} and r_{4+5} distally with 1 broad, nearly straight hyaline band extending from margin at apex of R_{2+3} to posteroapical margin of cell r_{4+5}. Cell m with 2 marginal hyaline marks, proximal mark [fused #26, #27] extending 3/4 distance to vein M, distal mark

[#29] extending to vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with only circular subapical hyaline spot [#20]. Posteromedial part of wing with large inverted Y- or V-shaped hyaline mark; proximal part [aligned and connected #13, #21, #22, #32, #34, #39] extending from cell br subapically, across cells dm and cu_1 subbasally, and across apex of vein A_1+Cu_2, broadly connected posteriorly in cell dm to distal band [fused #24, #33, #36] extending from posteromedially in cell dm to posterior wing margin; cell cu_1 with subapical marginal hyaline mark [#37] moderate sized. Cell dm without subapical hyaline spot [#25].

Abdomen: Mostly yellow. Syntergite 1+2 with 1 pair of dark brown spots not reaching lateral or posterior margins. Tergites 3–5 with pair of broad dark brown submedial vittae, not extended to lateral margin, but each tergite also with small posterolateral spot on margin; submedial vittae solid brown, without yellow spots within them but on tergites 4 and 5 narrowed on posterior half, well separated medially, but with irregular margins.

Female terminalia: Oviscape entirely dark brown; length 1.30 mm. Aculeus (Fig. 164) 0.94 mm long, 1.96 times as long as wide, with acute scales dorsally and ventrally on medial membrane; tip broad and short (lobed part 0.24 times as long as wide), with small convex weakly trilobe medial lobe and 3 pairs of additional lobes; sublateral lobe bluntly acute, much larger than submedial lobe, which is somewhat step-like and poorly developed; lateral lobe broadly rounded but not digitate; gaps between lobes shallow except that between lateral and sublateral lobes, gap between sublateral and submedial lobes very broad and transverse, submedial and medial lobes together less than 1/4 as wide as distance between apices of sublateral lobes. Spermathecae subspherical, with slender, straight sclerotized neck and with large cylindrical basal apodeme.

Distribution. Ecuador. The holotype was collected at 340 m elevation.

Type data. Holotype ♀ (UKaL USNMENT00213920), ECUADOR: Napo: Santa Cecilia, 340 m, 8 Jun - 1 Aug 1968, W. G. Saul.

Etymology. The name of this species is a Latin adjective referring to the single apical hyaline band crossing cell r_{2+3}.

***Blepharoneura variabilis* Norrbom & Condon, new species**
Figs. 71–76, 85, 109, 171

Diagnosis. This species differs from all other *Blepharoneura* species in the shape of its aculeus, which is almost bilobed due to the deeply concave medial apical area. It can also be recognized by the following combination of characters: pterostigma without subapical hyaline spot; scutum with 2 pairs of brown vittae; anepisternum entirely yellow; cell r_{2+3} between crossveins r-m and dm-cu more extensively brown than hyaline, and distally at most with 1 (usually 0) marginal hyaline spot; and cell cell r_{4+5} distally with hyaline band across cell. It is similar to *B. quetzali* in wing pattern, but the spot in cell r_{4+5} near crossvein dm-cu [#15] is aligned with or proximal to the crossvein, rather than slightly distal to it as in *B. quetzali*. The aculeus has a much deeper medial concavity and more lobes (4 rather than 2 pairs) than that of *B. quetzali*.

Description. Head (Fig. 85): Dark brown area on ocellar tubercle extended less than half distance to postocellar seta. Medial occipital sclerite with pair of brown submedial vittae on ventral half. Occipital suture narrowly brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae or rows of spots; submedial vitta often interrupted or narrowed slightly posterior to transverse suture and not connected to mark on posterior margin; sublateral vitta interrupted at transverse suture and separated from mark on posterior margin; posterior margin with 2 well separated brown marks. Notopleuron usually (12 of 14 specimens) with small posterior brown spot on lateral margin. Small brown spots anterior to postsutural supra-alar seta, anterior to postalar seta, and lateral to dorsolateral corner of scutellum present, sometimes small or faint. Scutellum entirely yellow or (4 specimens) with pair of minute brown spots on basal margin opposite posterior marks of scutum. Subscutellum and mediotergite with pair of dark brown vittae, moderately broad or sometimes

reaching lateral margin on ventral half of mediotergite. Pleuron entirely yellow or more often with small brown medial spot on anepimeron (9 of 14 specimens) and/or with brown marking on anatergite (with dorsal and/or ventral spots to mostly brown), rarely (1♂, USNMENT00213894) also with margins of katatergite brown. Basalare with brown spot, occasionally faint. Dorsocentral seta aligned with or slightly anterior to postalar seta.

Legs: Mostly yellow. Hind femur and sometimes mid femur with elongate, moderately broad anteroventral and posteroventral dark orange to red brown marks on apical 1/5–1/3 (Fig. 109).

Wing (Figs. 71–76): Length 5.35–6.80 mm, width 2.57–3.10 mm, ratio 2.00–2.20. Crossvein r-m at 0.51–0.55 distance from bm-cu to dm-cu. Cell c with 2 rectangular hyaline spots, both reaching costa and subcosta; medial brown area distinctly paler than area of cell r_1 posterior to pterostigma, sometimes fainter posteriorly or medially, and as broad as or usually broader than hyaline spots or rarely narrower than distal spot. Pterostigma without subapical hyaline spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) usually without hyaline spots, r_1 rarely (1 specimen) with small spot relatively distally (without spot posterior to apex of vein Sc), r_{2+3} occasionally (4 specimens) with 1 spot. Radial cells medially with relatively narrow slightly to strongly tapering basal marginal hyaline mark [#5] in cell r_1 and usually with aligned spots in r_{2+3} [#8] and r_{4+5} [#14], sometimes forming continuous band, but often narrowed posteriorly in r_1 or in r_{2+3}, spot in r_{2+3} sometimes absent (3 specimens) or not reaching R_{2+3} or R_{4+5}, usually narrower than spot in r_{4+5}; aligned spot [#14] in r_{4+5} more than half as wide as cell, rarely extended to vein M; cell r_{2+3} with more distal, moderately large hyaline spot [#9], touching R_{4+5} but only occasionally (2 specimens) reaching R_{2+3}; cell r_{4+5} with spot [#15] anterior to crossvein dm-cu or more proximal, rarely (1 wing of 2 specimens) fused to spot [#14] aligned with r_1 mark, often (8 specimens) with additional anterior or medial hyaline spot [#48] near midlength, occasionally (2 specimens) connected to bands from cell m or associated spot. Distally cell r_1 rarely with 1 small marginal hyaline spot [#6] (1 specimen) or 1 small pale brown posterior spot (1 specimen). Cell r_{2+3} without marginal hyaline marks or occasionally (4 of 13 specimens) with small spot [#10A] at apex of R_{2+3} or rarely (1♂, USNMENT00213893) with elongate mark [#10] extending almost to vein R_{4+5}; posteriorly with 2 large hyaline spots, often partially connected along R_{4+5} or fused into 1 broader mark, proximal mark [#10B?] posterior to apex of R_{2+3} usually larger than distal mark, isolated (6 specimens), fused to marginal spot (1♂, USNMENT00213893), or connected or fused to distal mark (6 specimens); distal mark [interior part of spot #11?] aligned with and connected to distal hyaline mark in cell r_{4+5} forming band extending to posteroapical margin of r_{4+5}, band relatively straight or concave, or if connected to proximal posterior mark in r_{2+3} appearing more or less parallel to costa. Cell r_{4+5} also with posterior hyaline spot or mark aligned and usually connected with hyaline marks in cell m. Cell m with 2 elongate marginal hyaline marks [proximal mark fusion of #26A, #26 and #27; distal mark #29], both usually connected to spot or mark in cell r_{4+5} forming bands or inverted V-shaped mark extending into latter cell, but sometimes (5 specimens) either proximal or distal or both marks interrupted, occasionally (3 specimens) proximal or both marks not reaching vein M. Cell br with subbasal hyaline spot [#12]. Cell bm usually with circular subbasal and subapical hyaline spots [#19, #20], subbasal spot rarely absent, or with single broad hyaline area [fused #19, #20]. Posteromedial part of wing with isolated hyaline spots, or usually with them variously connected to form larger markings; cell br with large subapical hyaline spot [#13] and often with smaller more proximal spot [#44], occasionally connected or fused into very broad spot; cell dm with 2 broad or 1 very broad hyaline mark(s) in basal 3/5, subbasal mark [fused #21, #22 and/or #51, #52] (or basal part of fused mark) aligned with or slightly proximal to subapical spot [#13] in cell br and with or distal to more proximal spot [#44] in br (if present) or if broad usually with both spots, also aligned with proximal anterior spot in cell cu_1 [#31]; cell dm also with large posteromedial spot [#23 and/or #24] (or distal extension to subbasal mark if they are fused) extending 2/3–3/4 or rarely (1♂) halfway to vein M; cell cu_1 medially with 2–3 anterior [#31, #32, and usually #33] hyaline spots (distal spot [#33] absent in 2 specimens) faintly separated from proximal and medial marginal hyaline spots [#34, #36], or usually with medial spot [#36] connected to medial and distal anterior

spots [#32, #33] and sometimes to proximal anterior spot [#31] and/or proximal marginal spot [#34] to form Y-shaped or trident shaped mark or posteriorly bilobed mark; subapical marginal hyaline spot [#37] moderate to large, often extending to vein Cu_1. Cell dm with anterior to anteromedial subapical hyaline spot [#25] relatively large, often extended to vein M.

Abdomen: All tergites with 4 evenly spaced dark brown spots, L-shaped posterolateral dark brown band, separated medially, and on tergites 3–5 anterolateral dark brown spot; some or all of these markings often connected or fused to form irregular lateral markings, but at least submedial spots distinct except sometimes on tergite 5.

Female terminalia: Oviscape entirely dark brown; length 1.00–1.12 mm. Aculeus (Fig. 171) 0.9 mm long, 3.6 times as long as wide, without scales dorsally or ventrally on membrane medially; lateral margin with minute, irregular serrations extending almost to lateral lobe; tip angular basolaterally, moderately long (lobed part 0.37–0.43 times as long as wide), with broad deep medial apical concavity (deeper than length of medial lobes and more than half as broad as distance between apices of subapical lobes) bordered by moderately large, triangular pair of medial lobes and with 3 pairs of small step-like lobes; sublateral and submedial lobes similar in size; lobes separated by elongate shallow gaps, lateral gap 2.00 times as long as wide, gap between medial and submedial lobes 1.5 times as long as wide. Spermathecae subspherical, with long, straight to slightly convoluted, slender sclerotized neck and with or without small cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on curved lobe, lateral prensiseta small to minute, less than one-third as wide as medial prensiseta, acute, orange brown to dark brown.

Distribution. Mexico (Chiapas). The type specimens were collected between 1300–2000 m elevation in the Sierra Madre de Chiapas.

Type data. Holotype ♀ (USNM USNMENT00213892), MEXICO: Chiapas: 49 km S of Jaltenango, [Parque Natural] El Triunfo, [15°40'N 92°48'W], 1300–2000 m, 13–15 May 1985, A. Freidberg. Paratypes: Same data as holotype, 4♂2♀ (USNM USNMENT00213890, USNMENT00213893, USNMENT00213896–97, USNMENT00213899–900) 3♂2♀ (TAUI USNMENT00213889, USNMENT00213891, USNMENT00213895, USNMENT00213901–02) 1♂ (IEXV USNMENT00213898); El Triunfo, 1800 m, 14 May 1985, A. Freidberg, 1♂ (USNM USNMENT00213894).

Etymology. The name of this species is a Latin adjective referring to the variable wing pattern.

Blepharoneura wasbaueri Norrbom & Condon, new species

Figs. 5, 77, 155

Diagnosis. This species differs from other *Blepharoneura* species by the following combination of characters: scutum with 2 pairs of brown vittae; anepisternum entirely yellow; hind femur brown on apical fourth; cells r_{2+3}, r_{4+5} and m each with 2 marginal or submarginal hyaline marks, those in r_{2+3} and r_{4+5} small; and aculeus tip with 7 lobes, including unpaired medial lobe, 2 pairs of step-like lobes, and broad, digitiform pair of lateral lobes.

Description. Head: Dark brown area on ocellar tubercle extended to or almost to level of postocellar seta. Medial occipital sclerite with pair of brown submedial vittae on ventral half. Occipital suture narrowly brown.

Thorax: Scutum entirely microtrichose, with 2 pairs of dark brown vittae; submedial vitta broadly interrupted posterior to transverse suture and not connected to mark on posterior margin; sublateral vitta sometimes (holotype) absent posterior to transverse suture, when present separated from mark on posterior margin; posterior margin with 2 well separated brown marks. Notopleuron entirely yellow. Small brown spots anterior to postsutural supra-alar seta and anterior to postalar seta absent. Small brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of small submedial brown spots (faint in paratype). Subscutellum with pair of dark brown spots on dorsolateral half, isolated from pair of narrow brown vittae on mediotergite. Pleuron entirely yellow or with small brown medial spot on anepimeron

(paratype). Basalare with brown spot. Dorsocentral seta aligned slightly anterior to postalar seta or almost midway between postalar and postsutural supra-alar seta.

Legs: Mostly yellow. Mid femur sometimes with diffuse elongate anteroventral and posteroventral brown marks. Hind femur brown on apical 1/4 but not extending to apex dorsally.

Wing (Figs. 5, 77): Length 7.04–7.30 mm, width 3.68–3.80 mm, ratio 1.91–1.92. Crossvein r-m at 0.55–0.56 distance from bm-cu to dm-cu. Cell c with 2 rectangular to inverted trapezoidal hyaline spots, both reaching costa and subcosta; medial brown area paler than area of cell r_1 posterior to pterostigma, fainter medially, and as broad as to slightly narrower than hyaline spots. Pterostigma entirely brown or (1 wing of holotype) with very small yellowish subapical spot. Cells r_1 and r_{2+3} basally (proximal to apex of R_1) with 1–2 small yellowish spots in r_1 and 1 small yellowish or hyaline spot in r_{2+3}. Radial cells medially with 2 narrow basal marginal hyaline marks in cell r_1 separated by narrower distinct dark brown area, both reaching R_{2+3}, basal mark [#5] quadrate; cell r_{2+3} with 1 moderately large hyaline spot [#8] aligned with basal mark in r_1 and 1 broader spot [#9] aligned with second mark in r_1, both reaching R_{2+3} and R_{4+5}; cell r_{4+5} with hyaline spot [#14] in anterior half of cell aligned between r_1 marks and with moderate sized hyaline spot [#15] aligned distal to dm-cu, sometimes (holotype) with additional posterior hyaline spot aligned with second mark in r_1. Distally cell r_1 with small marginal hyaline spot [#6] (holotype) or small hyaline spot [#6A] in posterior half (paratype). Cell r_{2+3} with 2 very small marginal hyaline spots [#10A, #11], neither extending half distance to R_{4+5}; with small to minute hyaline spot [#10B] in posterior half aligned with proximal marginal spot, touching or isolated from R_{4+5}; and also with 1–2 more proximal small to minute posterior hyaline or yellow spots [between dm-cu and #10B]. Cell r_{4+5} with small hyaline spot near or slightly posterior to midwidth aligned between hyaline marks in cell m; and with 2 small ovoid marginal or submarginal hyaline spots, anterior spot [18A] touching costa, posterior spot [#18] touching or narrowly isolated from costa; sometimes (1 wing of holotype) with additional minute hyaline spot slightly proximal to posterior spot. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 3 large ovoid hyaline spots, 2 marginal [#27, #29] and 1 medial spot [#26] aligned with proximal marginal spot, or (1 wing of holotype) with proximal marginal and medial spots fused to form short band; none of hyaline marks reaching vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu with (1 wing of holotype) or without hyaline spot in lobe. Posteromedial part of wing with multiple large hyaline spots and markings; cell br subapically with moderately large hyaline spot [#13] and usually (except in 1 wing of paratype) with smaller slightly more proximal hyaline spot [#44], both touching vein M but not R_{4+5}; cell dm with subbasal elongate hyaline mark across cell [fused #51, #52] or with only posterior spot [#52], posteriorly aligned with spot in cell cu_1 [#31] and anteriorly aligned with spot in cell br [#44] if present, posterior spot sometimes medially connected to anterior part of more distal mark [#21]; elongate hyaline mark across cell [fused #21, #22?, #23?, #24?], broader posteriorly, anterior part aligned with subapical spot in cell br [#13], posterior part aligned with Y-shaped mark in cell cu_1; cell cu_1 with relatively large anterior subbasal hyaline spot [#31] aligned with subbasal mark in dm, with broad Y-shaped medial mark [fused #32, #33, #36], narrowly or distinctly separated from proximal marginal mark across vein A_1+Cu_2 [#34, #39], proximal branch of mark [#32] aligned slightly distal to line from proximal marginal mark [#34] to subapical spot in cell br [#13], base of Y-shaped mark [#36] moderately broad; subapical marginal hyaline mark [#37] moderate sized, not reaching Cu_1. Cell dm with subapical spot [#25] hyaline and relatively large, touching or isolated from vein M; also with small to minute subapical hyaline or pale brown spot [#53] near midwidth or in posterior half aligned with or slightly proximal to subapical mark in cell cu_1.

Abdomen: Syntergite 1+2 with pair of brown bands (probably fused submedial and sublateral spots) and small brown spot on posterolateral corner. Tergites 3–5 with pair of relatively small submedial dark brown spots, on tergite 5 of male connected to sublateral mark; with pair of large sublateral brown marks (forming vittae), each with narrow medial extension along posterior margin and narrow lateral extension to posterolateral corner.

Female terminalia: Oviscape entirely dark brown; length 1.30 mm. Aculeus (Fig. 155) 0.95 mm long, 2.35 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip relatively short and broad (lobed part 0.32 times as long as wide), with small weakly trilobed medial lobe and 3 pairs of lobes, lateral lobe large and digitiform, with minute serrations apically, sublateral and submedial lobes acute, step-like, submedial lobe slightly smaller; medial, submedial and sublateral lobes separated by moderately deep gaps, ca. half as long as wide. Spermathecae subspherical, with nearly straight, slender sclerotized neck and small cylindrical basal apodeme.

Male terminalia (not dissected, but surstyli visible): Medial surstylus with prensisetae separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta slightly larger than medial prensiseta.

Distribution. Ecuador.

Type data. Holotype ♀ (CDFA USNMENT00104213), ECUADOR: Napo: Huahua Sumaco, Hollin - Loreto road, km 44, Malaise trap, 14 Dec 1989, M. & J. Wasbauer & H. Real. Paratypes: Same data as holotype, 16 Dec 1989, 1♂ (CDFA USNMENT00104212).

Etymology. The name of this species is a noun in the genitive case in honor of Marius S. Wasbauer, one of the collectors of the type specimens and the author of a very useful catalog of tephritid host plants.

Blepharoneura zumbadoi Norrbom & Condon, new species

Figs. 78, 145

Diagnosis. This species belongs to the *femoralis* complex (see diagnosis of *B. femoralis*), species of which are difficult to distinguish except by aculeus shape. That of *B. zumbadoi* differs from those of *B. osmundsonae* and *nigrifemur* in having the tip stouter (lobed part less than half as long as wide) and not rounded proximal to the lateral lobe. The lobes, particularly the lateral one, are larger than in *B. biseriata* and they are blunter than in *B. cyclantherae*, but the gaps are shallower than in *B. femoralis* which also has a rounded medial lobe. The scutellum, in lateral view, sometimes has a ventrobasal brown mark, a character state that also occurs rarely in *B. femoralis* but is otherwise unknown in the complex.

Description. Head: Dark brown area on ocellar tubercle extended almost to postocellar seta. Medial vertical seta in yellow area. Medial occipital sclerite with pair of dark brown submedial vittae on ventral half. Occipital suture narrowly dark brown, on lateral side bordered by slightly paler, wedge-shaped area, broader dorsally, just reaching postocular setae and sometimes almost reaching lateral vertical seta.

Thorax: Postpronotal lobe entirely yellow or with minute brown spot at junction with anepisternum. Scutum with 2 pairs of dark brown vittae; submedial vitta narrowed slightly posterior to transverse suture and connected to or narrowly separated from mark on posterior margin; sublateral vitta narrowly interrupted at transverse suture, narrowly separated from mark on posterior margin; posterior margin with 1 broad brown mark, narrowed medially. Notopleuron dark brown except small yellow area surrounding posterior seta. Small brown spot anterior to postsutural supra-alar seta, brown vitta anterior to postalar seta, and brown spot lateral to dorsolateral corner of scutellum present. Scutellum with pair of large submedial brown marks or single inverted U-shaped medial mark on disk usually extended to basal margin; side with or without small faint brown spot to moderately large dark brown L-shaped mark on ventrobasal margin. Subscutellum and mediotergite with pair of dark brown vittae, ventral half of lateral margin of mediotergite also narrowly brown, sometimes connected to vittae ventrally. Pleuron mostly dark brown, yellow only on propleuron, part of anepisternum (with large dorsomedial dark brown spot extending ventrally at least 2/3 distance to ventral margin, and broadly dark brown in posteroventral corner), extreme anterior and posterior corners of katepisternum, all of katepimeron, greater ampulla, narrow dorsal, posterior and ventral margins of anepimeron, and narrow anterodorsal margin of anatergite. Basalare brown. Dorsocentral seta aligned slightly anterior to postalar seta.

Legs: Mostly yellow. Mid femur with anteroventral and posteroventral brown marks on apical 1/5–1/4. Hind femur with entire apical 1/4–1/3 dark brown.

Wing (Fig. 78): Length 7.80–8.25 mm, width 3.70–3.80 mm, ratio 1.99–2.20. Crossvein r-m at 0.54–0.62 distance from bm-cu to dm-cu. Cell c with 2 broad rectangular hyaline spots, both reaching costa and subcosta; medial brown area almost as dark as area of cell r_1 posterior to pterostigma, sometimes paler medially, distinctly narrower than both hyaline spots. Pterostigma with large subapical hyaline spot [#3] reaching R_1. Cell r_1 basally (proximal to apex of R_1) with 2 pale brown to hyaline spots (occasionally fused into 1 elongate mark); cell r_{2+3} with 1–2 spots. Radial cells medially with 1 very broad quadrate basal hyaline mark [#5 fused with additional spot?] in cell r_1, sometimes partially divided posteriorly by pale brown spot; cell r_{2+3} with 2 broad to very broad hyaline spots [#8, #9] posterior to r_1 mark, both broadly reaching R_{4+5}; cell r_{4+5} with broad hyaline spot [#14] aligned with r_1 mark, extended from R_{4+5} slightly more than halfway across cell, and with medial hyaline spot [#15] near anterior end of dm-cu small; sometimes with small to minute anterior hyaline spot [#48] near midlength not touching vein R_{4+5}. Distally cell r_1 with 1 marginal subapical hyaline spot [#6]. Cell r_{2+3} with 2 marginal ovoid hyaline spots and subapical spot posterior to proximal spot [divided #10, #11], and sometimes with 1–2 minute more proximal spots. Cell r_{4+5} with small hyaline spot [#16] anteriorly, aligned with more proximal or between apical marks in cell r_{2+3}; with 1–2 large ovoid posterior hyaline spots aligned with hyaline marks in cell m; and with 2 ovoid or 1 bilobed marginal or submarginal hyaline spots [#18, #18A]. Cell m without subbasal hyaline spot [#49] near midlength of dm-cu; with 2–3 marginal hyaline spots, proximal and distal spots [#27, #29] large, medial spot [#28] very small if present, and 1 large anteromedial spot [fused #26, #26A], narrowly separated from proximal marginal spot; distal and anteromedial spots narrowly and faintly separated from vein M. Cell br with subbasal hyaline spot [#12]. Cell bm with circular subbasal and subapical hyaline spots [#19, #20]. Cell bcu with large hyaline spot in lobe. Anal lobe hyaline except brown area from apical part of lobe of cell bcu and base of vein A_1+Cu_2 crossing apex of vein A_2, occasionally (1♂) with small brown submarginal spot medially proximal to A_2. Posteromedial part of wing with large broad hyaline area; cell br with subapical hyaline spot [#13] and sometimes with smaller more proximal spot [#44], sometimes fused into 1 broad spot; cell dm with broad and long hyaline area [fusion of at least #51, #52, #21, #22, #23, #24, #50], sometimes narrowly or partially divided by pale brown medially, tapered distally, extending farther posteriorly than anteriorly; cell cu_1 medially with broad anteriorly trilobed and posteriorly 1–3 lobed mark [fused #31, #32, #33, #36, #36A, sometimes #34] or with more broadly fused area with 2 anterior and 1–3 marginal brown spots, broad on posterior wing margin, proximally connected to or narrowly separated from mark [fused #34, #39] across vein A_1+Cu_2; subapical marginal hyaline spot [#37] reaching vein Cu_1. Cell dm with anteromedial subapical hyaline spot [#25] and with posterior hyaline spot proximal to level of subapical mark in cell cu_1 and connected to proximal hyaline area.

Abdomen: Syntergite 1+2 with pair of isolated submedial brown spots and pair of irregular posterolateral brown marks. Tergites 3–5 with pair of isolated submedial brown spots, anterolateral brown spots, sometimes isolated, and pair of irregular lateral brown markings formed from connected submedial spots and L-shaped posterolateral bands, sometimes connected to anterolateral spots.

Female terminalia: Oviscape entirely dark brown, length 1.33 mm. Aculeus (Fig. 145) 0.77 mm long, 1.71 times as long as wide, with acute scales dorsally and ventrally on membrane medially; tip bluntly angulate basolaterally, short triangular (lobed part 0.45 times as long as wide), with small, truncate, slightly notched medial lobe and 3 pairs of step-like lobes separated by relatively shallow gaps, that between sublateral and submedial lobes deeper; sublateral lobe larger than submedial lobe; lateral gap 1.05 times as long as wide. Spermathecae subspherical, with slightly convoluted, slender sclerotized neck and large cylindrical basal apodeme.

Male terminalia: Medial surstylus with prensisetae subequal, separated by several times width of medial prensiseta, medial prensiseta on long lobe, lateral prensiseta on short lobe.

FIGURES 204–209. Host plants: 204, *Cyclanthera dissecta*, host of *B. cyclantherae*, Mexico: road to Huitzilac, 27 Sep 1991, mass of vines; 205, same, flowers and fruit (arrow); 206, *Microsechium helleri*, host of *B. regina*, Mexico: Lagunas de Zempoala, 25 Sep 1991, vine with fruits (arrow); 207, same, fruits, on right with emergence hole of larva (arrow); 208, same, cross section of infested fruit; 209, *Gurania acuminata*, host of *B. hirsuta*, Venezuela: Guatopo, Jan 1980, basal shoot mined by larva.

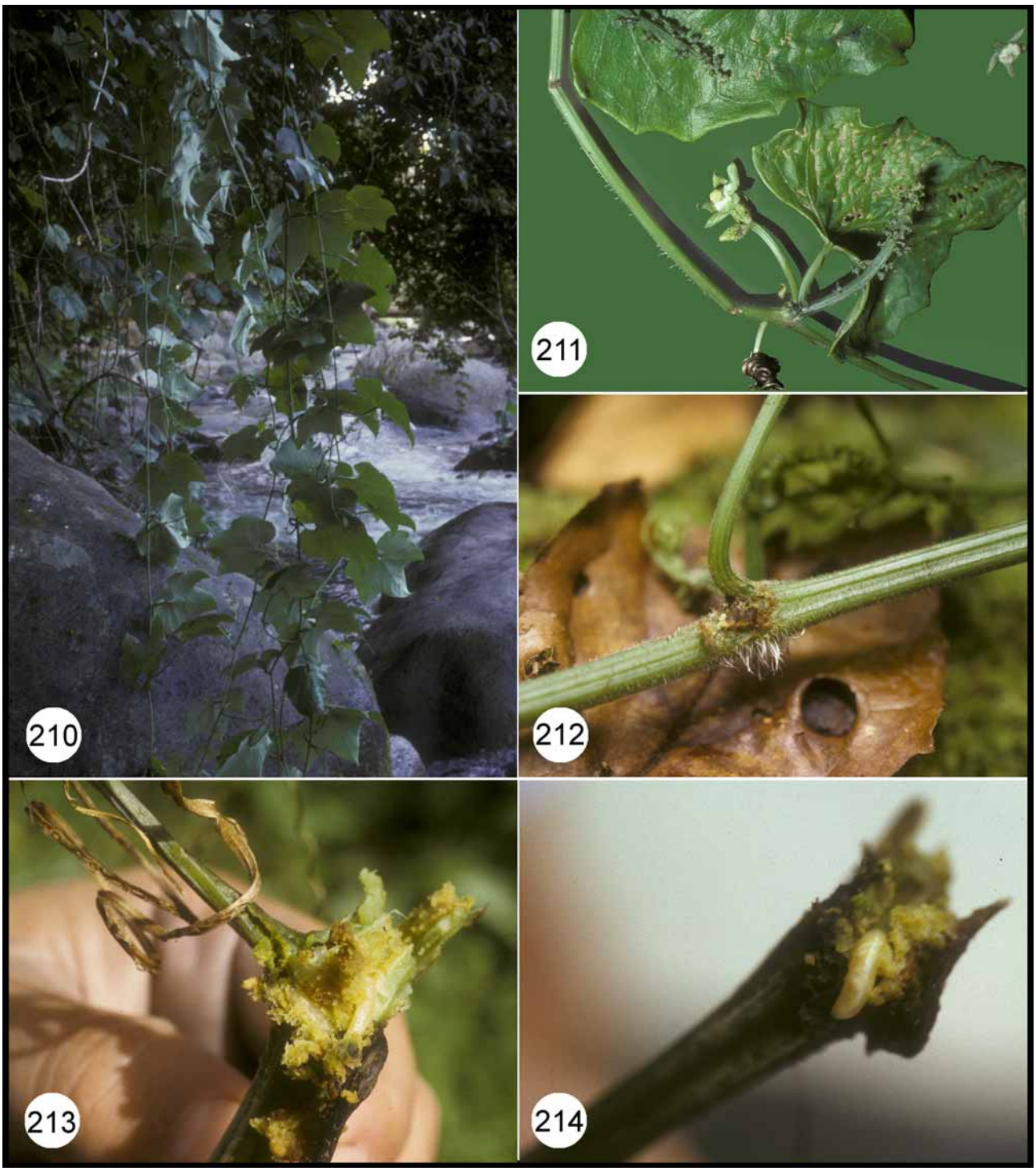
Distribution. Costa Rica. The collection sites are between 2200 and 2700 m elevation.

Type data. Holotype ♀ (INBio INBIO002578264), COSTA RICA: San José: San Gerardo de Dota, near Albergue Savegre, LS 389000 484200, 2200–2300 m, 19–22 May 1997, M. A. Zumbado. Paratypes: COSTA RICA: San José: Estación Biológico Cuericí, Sendero El Mirador, LS 389700 499600, 2640 m, 19 Feb - 15 Mar 1996, B. Gamboa R., 1♂ (INBio INBIO002381175); San Gerardo de Dota, 9°33'N 83°48'W, along Río

Savegre, end of log over river, 2200 m, on mixed patch of *Cyclanthera langei* Cogn. (95CR14) and *Sechium pittieri* (Cogn.) C. Jeffrey (95CR15), 20 Aug 1995, A. L. Norrbom, 1♂ (USNM USNMENT00048392).

Etymology. The name of this species is a noun in the genitive case in honor of Manuel Zumbado, the collector of the holotype, who is among the most prolific collectors of flies in Costa Rica.

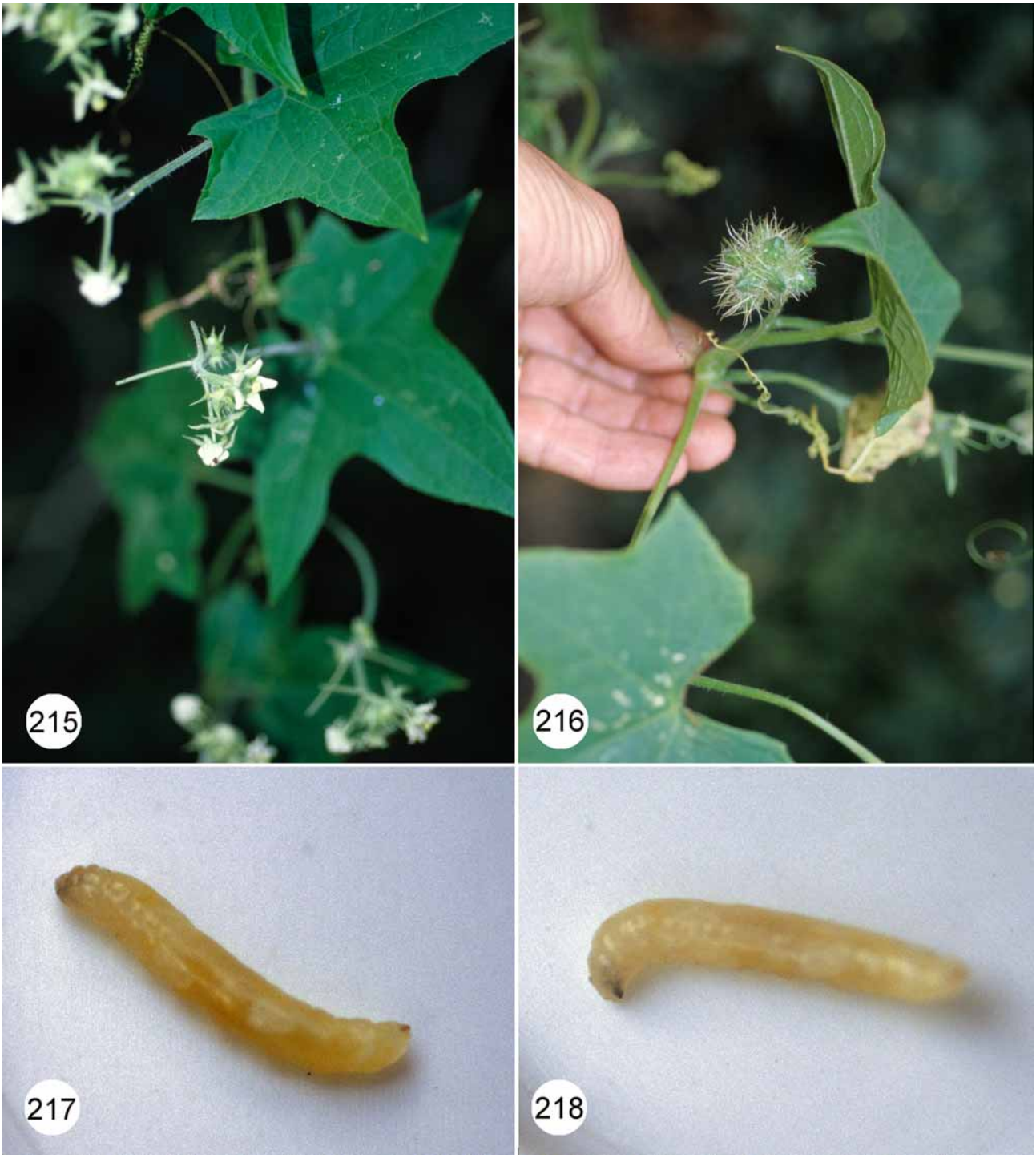
Biology. No specimens have been reared to determine the host plants of *B. zumbadoi*. One adult was collected on a mixed patch of *Cyclanthera langei* Cogn. (95CR14) and a *Sechium* species at San Gerardo de Dota, Costa Rica (also see Biology section).



FIGURES 210–214. Host plants: 210, *Sechium pittieri*, host of *Blepharoneura macwilliamsae*, Costa Rica: San Gerardo de Dota, May 1997; 211, same, flowers and leaves (leaf damage probably caused by *Blepharoneura* adults); 212, *Sechium* sp., node infested by larva of undetermined *Blepharoneura* species; 213, same, opened node with larva; 214, same, larva emerging from broken node.

Biology

Adults of *Blepharoneura* and the closely related genera *Baryglossa* and *Hexaptilona* have rows of spines on the labella, which are used, at least in *Blepharoneura*, for rasping leaves, flowers, or other tissues of their hosts (Driscoll & Condon 1994, Condon & Norrbom 1994, 1999). This is the only group of Tephritidae in which adults are known to use their mouthparts to abrade and and damage solid plant tissue, although species of some other genera will feed on sap exuding from oviposition marks or other wounds.



FIGURES 215–218. Host plants: *Sicyos* sp., poss. *longisepalus*, host of *Blepharoneura mexicana*, Guatemala: near Santa Elena Barrillas, 22 Nov 2007; 215, inflorescence; 216, fruits; 217–218, larva of *B. mexicana* ex stem mine. Photos by G.J. Steck.

All species of *Blepharoneura* whose biology is known feed as larvae in species of Cucurbitaceae, as does the one species of *Baryglossa* for which host data are known. They are not only highly host specific but also are specialized as to the type of plant organ attacked. Individual species lay eggs in only one of the following types of tissues: fruits, seeds, stems, or flowers (those attacking flowers usually specializing on either male or female flowers) (Condon & Norrbom 1999). Species of the *poecilosoma* group have been reared mostly from flowers, although a few species feed as larvae in fruits or seeds.

Host data for the *femoralis* group are scant, but the larvae of the five species that have been reared as well as larvae of two unidentified species were found feeding in fruits or stems. Condon & Norrbom (1999) provided a host plant table briefly listing the fly and plant species and the type of tissue attacked, but see the individual species treatments in this paper for the detailed specimen data that was the basis of those records and, in some cases, updated identifications of the fly species. *Blepharoneura cyclantherae* has been reared from fruits of *Cyclanthera dissecta* Arn. (Figs. 204–205) in central Mexico, *B. regina* Giglio-Tos from fruit of *Microsechium helleri* (Peyr.) Cogn. in central Mexico (Figs. 206–208), *B. macwilliamsae* from stem mines of *Sechium pittieri* (Cogn.) C. Jeffrey in Costa Rica (Figs. 210–211), *B. mexicana* from stem mines of a *Sicyos* sp. in Guatemala (Figs. 215–218), and *B. hirsuta* Bates from mines of basal shoots of *Gurania acuminata* Cogn. in Venezuela (Fig. 209). In May of 1995 additional larvae, which unfortunately were not successfully reared, were found by INBio parataxonomists and ALN feeding in leaf nodes of an undetermined *Sechium* species (Figs. 212–214). These larvae may possibly be *B. chaconi*, as adults of that species have been collected on this plant. The infested leaf nodes showed only slight external signs of damage (Fig. 212). The larvae were nearly mature but had not tunneled extensively in the stems, unlike the larvae of *B. hirsuta* and *macwilliamsae* which consume nearly the entire internal contents of at least two-thirds to over a meter of stem. We also found slender larvae mining stems of *Cyclanthera langaei* Cogn. at San Gerardo that are probably a species of the *femoralis* group. They may be *B. sinepuncta* or *zumbadoi* as those species were also collected as adults at San Gerardo on *C. langaei* or in a mixed patch of it and the *Sechium* species, which frequently grow together at this site.

Distribution

The overall distribution of the *femoralis* group extends from northwestern and northeastern Mexico (Sinaloa, Tamaulipas) to northwestern Argentina. No species are known from the West Indies or Chile. Known species diversity by country is as follows (including undescribed species): Argentina 2, Belize 1, Bolivia 7, Brazil 7 (3 northern, 4 southern), Colombia 3, Costa Rica 14, Ecuador 7, Guatemala 7, Guyana 2, Mexico 13, Nicaragua 1, Panama 2, Peru 5, and Venezuela 4. These data undoubtedly are biased by uneven collecting (e.g., the difference between Costa Rica and Panama), but the high diversity for Mexico is noteworthy. Also noteworthy is the high degree of sympatry among closely related or sister species within the *femoralis* group (e.g., *B. apaapa*, *hyalinella* and *nigriapex* known only from the same type locality in the Yungas region of Bolivia; *B. ruptafascia* and *unifasciata* known only from the same type locality in Ecuador; *B. furcifer* and *septemdigitata*, sympatric at least in eastern Peru and northern Bolivia; and *B. cornelli* and *lutea*, both known only from Costa Rica; the *aspiculosa-splendida* clade, including 5 species from Mexico to Ecuador with at least partially overlapping ranges; *B. bipunctata* and *multipunctata*, known only from adjoining provinces in Ecuador; and *B. amplihyalina* and *marshalli*, known only from adjoining regions in northwestern Argentina).

For the following summary of altitudinal distributions, except as indicated, the data in parentheses were derived from specimen labels or in a few cases from independent information provided by the collector or labels of specimens of other species collected at the same locality (e.g., Nova Teutonia, Brazil). We did not investigate in detail the elevations of other collection localities, but they appear to be consistent with the general altitudinal patterns.

Species of the *rupta* clade have been collected predominantly at low to middle elevations (<1000 m): *B. bidigitata* (300–500 m), *bivittata* (200 m), *brevivittata* (10 m), sp. nr. *brevivittata*, *cornelli* (50–150 m),

fernandezi **(**450 m**)**, *furcifer* (150–800 m), sp. nr. *furcifer* (400 m), *hirsuta* (600 m), *io* (type locality at ca. 1200 m), *lutea* (700 m), *quadristriata* (160–1600 m), *rupta*, *ruptafascia* (340 m), *septemdigitata* (250–750 m), *thetis* (300–500 m), sp. nr. *thetis* (750 m), and *unifasciata* (340 m).

Species of the *splendida*, *nigriapex*, and *regina* clades (except perhaps *B. isolata* of the *regina* clade (type locality at 350–450 m?)) appear to occur predominantly at higher elevations: *B. amplihyalina* (700–2000 m), *apaapa* (2000–2050 m), *aspiculosa* (1300–2000 m), *bipunctata* (2000 m), *biseriata* (2134 m), *chaconi* (2200–2600 m), *cyclantherae* (type locality at ca. 2170 m), *femoralis* (>1000 m, usually > 2000 m, except southern Brazilian specimens), *macwilliamsae* (1600–2350 m), *marshalli* (1500 m), *mexicana*, *mikenoltei* (2500 m), *multipunctata* (2600 m), *nigriapex* (2000 m), *nigrifemur* (2000 m), *osmundsonae* (2683 m), *quetzali* (1600 m), *sinepuncta* (900–2200 m), *regina* (2400–2900 m), *tau* (1600 m), *variabilis* (1300–2000 m), and *zumbadoi* (2200–2700 m). *Blepharoneura splendida* (480–1860 m) and *punctistigma* (480–2300 m) have been collected at a range of middle to moderately high elevations.

Phylogenetic relationships

As first noted by Munro (1957), *Blepharoneura* belongs to a clade that also includes the Afrotropical genus *Baryglossa* Bezzi and the southeastern Asian *Hexaptilona* Hering. The latter two genera form the sister group of *Blepharoneura*, and the fossil genus *Problepharoneura* Norrbom & Condon, or it and the Neotropical genus *Ceratodacus* Hendel, probably are the sister group of the above three genera (Norrbom & Condon 1999). These five genera comprise the subfamily Blepharoneurinae (Norrbom & Condon 1999, Korneyev 1999).

Blepharoneura is considered monophyletic based on its dorsally setulose vein Cu_1. This character state, which is rare in other Tephritidae and unique to *Blepharoneura* within the Blepharoneurinae, was considered a synapomorphy of the genus by Norrbom & Condon (1999). Within *Blepharoneura*, two species groups have been recognized: the *femoralis* group and the *poecilosoma* group. The *poecilosoma* group is supported as monophyletic by the structure of the aculeus tip, which has numerous marginal serrations, each associated with an internal channel (Condon & Norrbom 1994, Norrbom & Condon 1999).

For analysis of relationships within the *femoralis* group, the following outgroup taxa were selected: *Hexaptilona* (both sexes of *H. palpata* (Hendel) and a female of *H. hexacinioides* (Hering); there was little variation and they were scored as a composite in the matrix), and *Baryglossa trulla* Munro (female only). Two species of the *Blepharoneura poecilosoma* group, *B. diva* Giglio-Tos and an undescribed species (sp. x), were included in the ingroup to test the monophyly of the *femoralis* group. The wings of the outgroup species and the two species of the *poecilosoma* group included in the analysis are shown in Figures 79–83.

Characters used in the analysis are listed in Table 1, and the taxa were scored as indicated in the matrix in Table 2. The matrix was analyzed using TNT (Goloboff *et al*. 2003) (max trees = 10,000, traditional search, swapping algorithum = tree bisection reconnection, all characters non-additive and unweighted). The analysis resulted in 72 trees of 289 steps. The strict consensus of these trees is shown in Figures 219–221.

TABLE 1. Characters used in phylogenetic analysis of *Blepharoneura femoralis* group.

1. Vertex color – 0) Brown area on ocellar tubercle not extended beyond postocellar seta; 1) brown area on ocellar tubercle extended beyond postocellar seta or small medial brown spot present slightly ventral to postocellar seta; 2) with brown markings surrounding medial vertical seta (may be band or mark covering most of vertex). The spot in *B. diva* and sp. x, which is mostly anterolateral to the medial vertical seta, may or may not be homologous with that in some species of the *femoralis* group, in which it extends posteromesal to the seta.
2. Medial occipital sclerite – 0) with submedial pair of brown vittae on ventral half; 1) entirely yellow.
3. Area lateral to occipital suture – 0) entirely yellow; 1) with brown band or triangular marking extending from medial part of suture towards postocular setae or reaching eye margin, not extending medially beyond occipital suture; 2) with broad triangular brown marking also extending medially and fused with submedial vitta; 3) with diffuse brown spot dorsally, touching lateral vertical seta.

4. Scutal microtrichia – 0) entirely microtrichose; 1) with large nonmicrotrichose area.
5. Posterior margin of scutum, brown markings – 0) with 2 separate marks; 1) with 1 mark, bimodal, narrowest medially; 2) with 1 mark, trapezoidal or triangular, broadest medially, or narrow band; 3) without brown marks.
6. Scutal brown vittae – 0) with 2 pairs of vittae or rows of spots or at least 2 presutural pairs of marks; 1) with 3 vittae or rows of spots (or at least 3 presutural marks), including unpaired medial vitta and pair of spots or vittae aligned with medial corner of postpronotal lobe and dorsocentral seta or [*B. cornelli*] with only the latter pair of marks; 2) with 1 pair of submedial vittae or rows of spots at least presuturally; 3) with 1 pair of lateral vittae only; 4) without brown vittae. *B. brevivittata* and *bivittata* sometimes have a second postsutural vitta, but only 1 presutural pair and were coded state 2. Vittae are sometimes absent in the *poecilosoma* group and often vary intraspecifically, but most species have markings similar to *B. diva* or as in Condon & Norrbom (1994, fig. 5c).
7. Notopleuron – 0) with brown vitta on lateral margin extending over entire lateral margin of postpronotal lobe; 1) without brown marking; 2) with lateral brown vitta or spot(s) or mostly brown (postpronotal lobe entirely yellow or with diffuse brown spot posterolaterally).
8. Anterodorsal corner of anepisternum and postpronotal lobe laterally – 0) entirely yellow; 1) anepisternum with brown spot, usually triangular or sideways V-shaped (small in *B. zumbadoi* and *chaconi*); 2) with spot as in state 1, also with small diffuse brown spot laterally on postpronotal lobe ventral to postpronotal seta; 3) anepisternum with narrow brown vitta on dorsal margin and postpronotal lobe with broad brown vitta laterally.
9. Spot anterior to postsutural supra-alar seta – 0) present; 1) absent. This spot is also sometimes absent in the *poecilosoma* group.
10. Spot or vitta anterior to postalar seta – 0) present; 1) absent. This spot is also sometimes absent in the *poecilosoma* group.
11. Spot lateral to base of scutellum (lateral to dorsolateral corner) – 0) present; 1) absent. *B. thetis*, sp. nr. *thetis*, and some *B. quadristriata* have a mark in this area extending from the medial posterior scutal mark or (some *B. quadristriata*) a spot immediately posterior to the intra-alar seta. They were tentatively coded state 0.
12. Scutellum dorsal color pattern – 0) entirely yellow; 1) with single medial spot, not narrowed medially; 2) with ovoid or elongate paired medial spots or single inverted U-shaped or inverted mushroom shaped spot, not extended laterally to basal setae; 3) with widely separated or transversely elongate paired lateral spots, often extended to basal setae, or with transverse band (spots connected medially); 4) brown, except laterally, extending to apex. Some specimens of *B. variabilis* and *macwilliamsae* have a pair of minute spots on the basal margin, not considered homologous to the markings in states 1–3, and they were coded state 0. *Hexaptilona* species have a pair of sublateral spots on the basal margin that do not appear to be homologous with the markings in *Blepharoneura*. These markings were disregarded in scoring this taxon. *H. hexacinioides* sometimes has a pair of submedial spots.
13. Scutellum lateral color – 0) without brown markings; 1) with brown spot or mark on or near ventrobasal corner. The markings in *B. thetis* and one specimen of *B. hirsuta* are in a different position and probably not homologous. These species were coded state 0.
14. Subscutellum and mediotergite – 0) both with pair of brown vittae or entirely brown except narrowly medially; 1) subscutellum entirely yellow, mediotergite with pair of brown vittae; 2) mediotergite entirely yellow, subscutellum with narrow brown mark on dorsal margin laterally; 3) both entirely yellow.
15. Anepisternum – 0) entirely yellow; 1) with small dark brown spot dorsal or posterodorsal to anterior seta; 2) mostly brown or at least with brown medial spot extended to level of anterior seta; 3) with narrow vitta on dorsal margin only.
16. Katepisternum – 0) entirely yellow; 1) with brown marking.
17. Anepimeron – 0) entirely yellow; 1) with brown marking.
18. Katatergite – 0) brown ventrally or dorsally and ventrally; 1) with brown margins; 2) brown only dorsally or posterodorsally; 3) mostly or centrally brown; 4) entirely yellow. State 4 also sometimes occurs in the *poecilosoma* group.
19. Anatergite – 0) mostly brown or at least brown in posteroventral corner; 1) with dorsomedial brown spot or sometimes more extensively brown, but at least posteroventral corner yellow; 2) entirely yellow. State 2 also sometimes occurs in the *poecilosoma* group.
20. Meron – 0) entirely yellow; 1) with brown marking.
21. Basalare – 0) with brown spot or entirely brown; 1) entirely yellow. State 1 also sometimes occurs in the *poecilosoma* group.
22. Femora color – 0) entirely yellow; 1) yellow except hind femur and sometimes mid femur with elongate anteroventral and posteroventral brown marks on apical 1/5–1/4; 2) yellow except hind femur with entire apical 1/6–1/2 brown, and sometimes mid femur with anterior and posteroventral brown marks on apical 1/5–1/4; 3) yellow except hind femur with anterior apical spot [not just on anteroventral apical ridge]; 4) yellow except anteroventral apical ridge of mid femur and/or anteroventral basal ridge of mid tibia and/or anteroventral and posteroventral apical ridges of hind femur and/or anteroventral and posteroventral basal ridges of hind tibia dark brown. *B. nigriapex* in which the apical 1/6 of the hind femur is brown was tentatively scored state 2; in other species with this state the apical 1/4–1/2 is brown.

Wing

23. Costal cell – 0) with 2 distinct rectangular to triangular hyaline areas, margins well differentiated, or with single partially fused area with medial brown mark higher than wide; 1) with 2 rounded hyaline areas or single goggles-shaped area, or hyaline area diffuse and margins poorly differentiated.
24. Pterostigma subapical hyaline or pale brown spot [#3] – 0) present; 1) absent. The spot is variable in the *poecilosoma* group.
25. Cells r_1 and r_{2+3} proximal to level of apex of vein R_1 – 0) only with spot in r_1 (usually posterior to apex of Sc); 1) without hyaline or pale brown spots; 2) with more than 1 spot.
26. Shape of basal marginal spot [#5] in cell r_1 – 0) tapered; 1) not tapered.
27. Basal marginal hyaline marks in cell r_1 – 0) with single narrow mark; 1) with 2 marks, 1 partially divided mark, or 1 very broad mark (presumed fusion of 2 marks).
28. Hyaline spots in cell r_{2+3} between crossveins r-m and dm-cu – 0) with 1–2 spots, if only 1 [#9] it is distal to spot in r_1 [#5], if 2 spots they are relatively small (combined less extensive than brown area(s) between crossveins); 1) with no more than 1 spot [#8], more or less aligned with basomarginal spot in r_1; 2) with 2–3 large spots [#8, #9] (combined usually more extensive than brown area(s) between crossveins), or with 1 very broad hyaline area. In *B. amplihyalina* and *marshalli* the hyaline area is usually broad and often aligned with r-m which is more distal than in most other species. In *B. diva* and *pulchella* the spots are occasionally absent, but when present there is at least the more distal spot.
29. Spots in apical part of r_1 – 0) with 1 hyaline spot [#6] touching or almost touching margin; 1) without hyaline spots; 2) with more than 1 spot [#6 plus additional spot(s)] touching or almost touching margin; 3) with only posterior spot(s). In the *poecilosoma* group some species have state 0, some have state 1, and some are polymorphic for states 0 and 1.
30. Cells r_{2+3} and r_{4+5} distal to dm-cu with numerous additional spots (usually tiny and/or pale brown) – 0) absent; 1) present.
31. Cell r_{4+5} with spot [#15] near crossvein dm-cu – 0) present; 1) absent.
32. Cell r_{4+5} with spot [#15] near crossvein dm-cu and spot [#14] aligned with r_1 hyaline mark both very large, sometimes fused – 0) no; 1) yes. Spot #14 is large in *B. zumbadoi* and *macwilliamsae*, but spot #15 is small and these species were scored state 0.
33. Hyaline markings in cell m and in cells r_{2+3} and r_{4+5} distal to dm-cu – 0) with marginal or submarginal spots, including 2 in r_{2+3} [#10, #11] (sometimes fused into 1 irregular mark) and at least 2 in m [#27, #29], often not elongate (usually forming triangular pattern with anteromedial spot [#26, or fused #26 + #26A] or fused into 1 large triangular mark); 1) cells r_{2+3} and m each with 2 elongate hyaline marks [1 specimen each of *B. furcifer* and *B. septemdigitata* have 3 spots in m], distal mark in r_{2+3} usually aligned with mark in r_{4+5} forming concave band extending to margin of r_{4+5} [including #11 and #18], proximal mark in r_{2+3} [#10] often aligned with mark in r_{4+5} forming band extending into r_{4+5}, sometimes connecting or almost connecting with proximal mark in cell m [fused #26, #26A and #27] to form band; 2) r_{2+3} with 0–1 marginal marks, wing with 3 bands extending from posterior margin (2 in cell m), most distal band largest, extending into r_{2+3}, straight to convex (usually parallel to costa). *Blepharoneura variabilis* sometimes has a separate marginal hyaline spot or elongate mark in cell r_{2+3}; although not having 2 marginal hyaline spots in r_{2+3}, it was scored as variable for states 1 and 2 because in many specimens the subapical band is convex (as in state 1) although it does not reach the margin in r_{2+3}. In some species of *Baryglossa* the markings near the apex of the wing are fused, but the pattern differs from that within the *femoralis* group suggesting that it is independently derived. At least one species of the *poecilosoma* group is banded apically (state 2), but it is clearly related to species with a spotted pattern. Thus state 0 appears to be plesiomorphic for the *femoralis* group.
34. Cell r_{4+5} area aligned with proximal marginal hyaline mark in cell r_{2+3} [#10] – 0) without aligned, connected hyaline area (i.e., wing without band extending into cell r_{4+5}); 1) with hyaline mark aligned and connected with proximal mark in r_{2+3} forming band extending into cell r_{4+5}.
35. Number of marginal or submarginal spots in cell r_{4+5} – 0) 1 spot [#18]; 1) 2 spots [#18, #18A] or 1 large bilobed spot [#18 and #18A connected proximally].
36. Number of marginal or submarginal hyaline marks in cell m – 0) 3 [#27, #28, #29]; 1) 2 [#27, #29]. In species with only 2 marginal hyaline marks we hypothesize that the proximal one is number #27 and that #28 is lost because #28 is small when rarely present in *B. femoralis* and *zumbadoi*. In the *poecilosoma* group some species have state 0, some have state 1, and some are polymorphic for states 0 and 1.
37. Size of medial marginal or submarginal hyaline spot in cell m – 0) medial spot [#28] similar in size to other 2 marginal spots [#27, #29] (or absent); 1) medial spot [#28 fused with #26 and sometimes #26A] larger than other 2 marginal spots. *Blepharoneura amplihyalina* and *marshalli* were difficult to score for this character because in most specimens all of the spots in cell m are connected or fused; both species were scored state 1 because in one specimen of *B. amplihyalina* there is a separate large medial mark [fused #28, #26, #26A].

38. Hyaline marks in cell m and adjacent area in cell r_{4+5} – 0) cell r_{4+5} without spots aligned with either mark in cell m [#26, #26A, #29]; 1) r_{4+5} with spot or spots aligned with 1 or both marks in m, but neither connected to form band extending into r_{4+5}; 2) r_{4+5} with marks aligned and connected with both marks in m, forming bands or inverted V-shaped mark extending into r_{4+5}; 3) r_{4+5} with mark aligned and connected with only distal mark in m to form band extending into r_{4+5} (if present, spot aligned with proximal mark isolated); 4) r_{4+5} with mark aligned and connected with only proximal mark in m to form band extending into r_{4+5} (if present, spot aligned with distal mark isolated).
39. Cell m with subbasal spot [#49] near midlength of dm-cu – 0) absent; 1) present.
40. Cell br subbasal spot [#12] – 0) present; 1) absent.
41. Cell bm spots – 0) with 2 spots, subbasal and subapical [#19, #20]; 1) with 1 large spot [fused #19 and #20]; 2) with only subapical or small medial spot [#20]; 3) without hyaline spots.
42. Spot #25 – 0) present; 1) absent. Presumed fused with posterior spot or band in *B. splendida* and most *B. sinepuncta*; possibly fused with basal marks in *B. amplihyalina* and *nigriapex*.
43. Cell dm with posterior subapical hyaline spot [#53] aligned with subapical hyaline mark in cell cu_1 [#37] – 0) absent; 1) present.
44. Cell dm with subbasal hyaline band or series of spots – 0) without hyaline band or aligned spots [#51, #52] proximal to level of subapical spot in cell br [#13]; 1) with band or pair of aligned spots [#51, #52] or at least a posterior spot [#52] distinctly proximal to subapical spot in cell br [#13], usually aligned with more proximal anterior spot in cell br [#44] and anterior proximal spot [#31] (or proximal anterior part of more extensive mark) in cell cu_1 if the latter spots present (species with a large hyaline area extending well proximal to level of spot #13 were also coded state 1).
45. Cell dm with anteromedial hyaline spot [#50] distal to level of subapical spot in cell br [#13] and aligned spot [#21] in dm – 0) absent; 1) present (species with a large hyaline area extending to this area were also scored state 1).
46. Cell cu_1 anteromedial spot [#32] – 0) aligned distal to line between proximal marginal spot [#34] and subapical spot in cell br [#13]; 1) aligned with proximal marginal spot [#34] and subapical spot in cell br [#13], often forming band. *B. tau*, in which spot #32 is absent, and *B. amplihyalina* and *marshalli*, which have a large hyaline area covering all of the middle of cell cu_1 (presumably including fused spots #32 and #33), were scored state 0.
47. Cell cu_1 medial marginal hyaline markings (excluding mark on apical part of vein A_1+Cu_2 [#34] and subapical mark [#37]) – 0) with 1 marginal spot [#36] or relatively narrow extension of larger fused area; 1) with 2 spots [#36, #36A] or extensions of larger fused area or with very broad hyaline marginal area [fused spots #36 and #36A], usually with small marginal or submarginal brown spot within it.
48. Cell cu_1 medial hyaline markings – 0) with medial anterior hyaline spot [#32] (aligned slightly proximal to medial marginal spot [#36]) small to moderate sized and well separated from medial marginal spot [#36]; 1) with medial anterior hyaline spot [#32] large and connected or almost connected with medial marginal spot [#36] (often connected to 1–2 anterior spots [#31 and/or #33] and/or 1–2 other posterior spots [#34 and/or #36A] forming Y-shaped, trident-shaped, or H-shaped mark or very broad hyaline area.
49. Hyaline medial mark(s) in cell dm – 0) total area of spots or larger fused area relatively narrow, less than half as long as cell; 1) broadly fused into large hyaline area more than half as long as cell, narrowed distally; 2) as state 1, but broad distally, anterodistal corner extended to or almost to anterior margin of cell; 3) reduced except for broad posteromedial spot [fused #23, #24, usually also #22], anterior spot [#21] aligned with subapical spot [#13] in br absent.
50. Cell cu_1 subapical hyaline spot [#37] – 0) present; 1) absent.

Abdomen

51. General pattern – 0) usually spotted or reticulate, if largely dark brown (markings fused), medial yellow area relatively narrow and with irregular margins; 1) with submedial vittae, rows of large spots, or irregular (usually bi- or trimodal) brown markings, widely separated medially by tapering yellow area with even or nearly even margins. *B. cornelli*, which has a broad yellow medial area with uneven margins, was tentatively scored state 0. *B. fernandezi*, which has reduced markings, was scored state 1 because their medial margins are aligned as in species with vittae.
52. Tergites 3–5 – 0) without anterolateral spot; 1) with anterolateral spot (on or near lateral margin) or with margin more broadly brown anteriorly. Species in which the entire lateral margin is brown were difficult to score. Those with the margin more broadly brown anteriorly (e.g., *B. chaconi*, *mikenoltei*) were hypothesized to have the spot fused to posterior markings and were scored state 1. *B. cornelli* and *septemdigitata*, in which the mark is parallel sided or narrowed anteriorly (appearing more like an extension of the posterior mark) and sometimes not extending anteriorly on tergite 3, were scored 0.
53. Syntergite 1+2 with submedial spot fused on its lateral side to posterolateral band – 0) no; 1) yes. *B. macwilliamsae*, in which the spot is sometimes narrowly connected near its midwidth, was scored state 0.
54. Brown markings solid, without yellow spots within them – 0) no (or all brown markings small); 1) yes.
55. Lateral margins of tergites – 0) with brown markings; 1) entirely yellow, without brown markings.

Aculeus

56. Aculeus shape (length/ width) – 0) > 4.0; 1) 2.4 – 4.0; 2) < 2.4.
57. Medial membrane of aculeus – 0) without scales; 1) with acute triangular scales; 2) with mostly blunt scales.
58. Aculeus tip lateral lobe shape – 0) not digitate; 1) digitate (projecting, rounded).
59. Aculeus tip sublateral lobe – 0) not broad and slanted; 1) lobe broad and slanted.
60. Gap between sublateral and submedial lobes – 0) no larger than gap between sublateral and lateral lobes; 1) much broader than gap between sublateral and lateral lobes (not deep, mostly perpendicular to long axis of aculeus).
61. Aculeus tip medially – 0) with convex, truncate, shallowly notched or minutely trilobed medial lobe; 1) with broad, deep medial concavity; 2) with broad, shallow medial concavity; 3) with narrow, small, acute medial indentation.
62. Aculeus tip marginal serrations – 0) without serrations; 1) with minute serrations, not associated with channels, on at least lateral lobe; 2) with minute serrations on lateral margin (not on lobes); 3) with large serrations associated with channels. Species of the *Blepharoneura poecilosoma* group have distinct serrations, each associated with an internal channel. Where present in the *femoralis* group, the serrations are much smaller and not associated with a channel. *Hexaptilona hexacinioides* also has minute serrations, but none are present in *H. palpada* or *Baryglossa trulla*.
63. Spermathecal neck – 0) slender, straight to slightly convoluted; 1) moderately stout, strongly convoluted; 2) with short, weak basal part and very stout, cylindrical distal part.
64. Medial surstylus – 0) moderately broad and short, prensisetae closely approximated; 1) moderately long, prensisetae well separated, at least medial prensiseta on lobe; 2) elongate, slender, prensisetae closely approximated; 3) relatively short and broad, prensisetae well separated, neither on a lobe. The shape of the medial surstylus and the spacing of the prensisetae also varies within the *poecilosoma* group.
65. Lateral prensiseta – 0) subequal to as large as medial prensiseta; 1) minute to small, much smaller than medial prensiseta; 2) absent.
66. Sclerotized part of glans – 0) small, slender, more or less cylindrical; 1) large, stout, bulbous.

The monophyly of the *femoralis* group is supported in the analysis, but no obvious, unequivocal synapomorphies (i.e., easily defined and without homoplasy or subsequent character state changes) have been identified. We will further test this hypothesis with DNA sequences as samples become available. The shape of the aculeus, which is broad and flat, usually with a rather truncate apex and distinct lobes, may be a synapomorphy, but there is no single aspect of it that is clearly a unique apomorphy. The length to width ratio of the aculeus (character 57) may be a synapomorphy for the *femoralis* group, but the there is overlap in the range of this character in *Hexaptilona* (thus the polarity of this character is uncertain). The aculeus is more elongate in the *poecilosoma* group and in *Baryglossa trulla*, but may be shorter in other *Baryglossa* species, and the tip is somewhat triangular in some species of the *femoralis* group (e.g., *B. aspiculosa*, *mexicana*, *nigrifemur*, *quadristriata*, *quetzali*), and the lobes are sometimes weaker, similar to some species of *Hexaptilona* and *Baryglossa*. The bulbous shape and large size of the sclerotized part of the glans (character 66), which may be correlated with aculeus shape, is another possible synapomorphy for the *femoralis* group. Several other character states that are not present in all species of the *femoralis* group also can be interpreted as synapomorphies of the group, but only assuming secondary loss in some species. Among these are the shape of the basal marginal hyaline spot [#5] in cell r_1 (char. 26) (assumes reversal in most of the *rupta* clade and within the *splendida* clade), the number of hyaline marginal spots in cell m (char. 36) (assumes reversal in the *nigriapex* clade; also there is convergence within the *poecilosoma* group which includes many species that are polymorphic for that character), and the presence of a subbasal hyaline mark in cell dm or a very broad hyaline area extending to this area (char. 44) (requires reversal within all four clades).

Four large clades within the *femoralis* group were recognized (Fig. 219), the *regina*, *nigriapex*, *splendida* and *rupta* clades. The *regina* clade is hypothesized as the sister group of the rest of the *femoralis* group. Synapomorphies of the *rupta* + *nigriapex* + *splendida* clades include: The number of marginal or submarginal hyaline spots in cell r_{4+5} (char. 35) (assumes reversal within all 3 clades), the very short and broad shape of the aculeus (char. 56.2), and the presence of sclerotized scales on the medial membrane of the aculeus (char. 57) (assumes reversal in *B. amplihyalina* and *marshalli*).

TABLE 2. Character matrix used in phylogenetic analysis of *Blepharoneura femoralis* group.

Taxon	1111111111222222222233333333334444444444555555555566666661234567890123456789012345678901234567890123456789012345678901234567890123456
Outgroup	
Hexaptilona	0020000300000030000000002010010000000100000000000000000010000000000 2 1 2 2
Barygl. trulla	0021000311140021130100010010000000001101101011010000000000000000???
diva	2000031001000000000000000000000000000000000000000000000000000000030000 1 1
sp. x	2000001000000000000000002000200000000000000010000000000000003?000 2
Ingroup	
splendida	0011002000020021130102000011100020010200000000010001100210000001011 1 1 11 3 21 1 1
punctistigma	0010102000020021130102000011000020010200000001010001000210000001011 2 1 1 1 1 3 2
aspiculosa	0010102000020021130102002011100020010200000101011001000200000000???
sinepuncta	0010102000021021130102010011100020010200100001000001100210000001011 1 1 2 3 21 1 1
femoralis	0010002000020021130101000112000000100100000100010001000210000001011 11 1 1 2 2 1 1 1111 1 1 2 3
zumbadoi	0010102000020021130102002112000000100100000110011001000210000001011 1 1 1 1
cyclantherae	0011002000020021130102000112000000110100200100011000100210000001211 1 1 12 1 1 1 1
biseriata	0011102000020021130102002112000000110100200100011001100210000001011 1
nr. *biseriata*	???1102000020021130102002112000000110100000110011001100220000000???
osmundsonae	0001102000020021130102000112000000110100000110011000000120000001011 1 1 2 1 2 11 2
nigrifemur	0010102000020021130102000112000000110100000100111001000210000001011 1 2 2 1 1
multipunctata	0000002200010010040004002112210000101110001100113001000210001000??
bipunctata	0000002100010010100004002112010000101010001000113001000210000000??
apaapa	0000002100010010041004002010010000001010000000113001000210000001011 2 1 1 2 1 2 1 1 1
hyalinella	0000002200010010041004002000210000000110001000113000000210000001011 1 1 1 1 1 1 1 1
nigriapex	0000002200010010041002002000210000001110011111011200100021000000???
amplihyalina	0000002000010000041000002012000000001100110110112001000200003001011 1 1 31 1 1 1
marshalli	0000002000010000040000002011000000001000010110112001000200002001011 1 1 1 1 1 211 1 11 1 1 3
tau	0031202000020010121011011001100020010200200000000101010?????????10?
macwilliamsae	0000002000000000000101002102000000010100100110111001000210000001011 1 1 11 1 1 31 1 1 2 1 4
bidigitata	0100002000020000020000000102000000110000000100010000000211010101111 1 2 41 3 2 21 11 211 1

Table 2. (continued).

```
                        1111111111222222222233333333334444444444555555555566666666
Taxon                   1234567890123456789012345678901234567890123456789012345678901234567890123456
-------------------------------------------------------------------------------------------------------
wasbaueri               0000001011020000042002002112010000110100000100010000100211000101O?
                                        1       1     3
mikenoltei              0000041000000000110011002002000100110100001110010001000100000200???
                                              1
chaconi                 1000102000020000110111002102000100010100001110011001000100000200111
                               1        1        1     1          111
                                                    2             2
quetzali                0000002000000000042001010000100010010200000100010001000100000220???
                                        1                 2     3        1
variabilis              0000001000000000010001011000000110010100000000000000100010000120111
                              2          142      21  1    2     2  1  1    1
                                                          3  2
                                                          4
mexicana                0000001000100000040010000112000000010100000110011000000100002001111
                             42 11    3   1 2   1 11    1      1    1 1 1
                                                2   2
regina                  0000001000000000100010002102200100010110001111011200000010000320111
                         1    22 111     1 421       1  1     1      1
isolata                 0100001000000000042010002100300020010300000000110001000???????????
unifasciata             0100021011100300042014001000100020010000210001000010010210010000???
ruptafascia             0100001011100000042014001000100010010000210001000010010210010000???
                                                    1
thetis                  2101221011030100042010000000000000110000000100000010000????????101
                                                                                    11
nr. thetis              2101221011000100042010001000000000010000000101000010010????????101
fernandezi              0101321011100300042010000000000000010000000100010010011211001120??
                        2    4                    1   3            1    1
nr.brevivittata         2101321011100300042010001000100020010000000101000010011????????101
                                                  13            2        1
brevivittata            2101221011100000042010101001100020010000000000101001001121100112101
                          3        2 1          1      1      2 121 11    1
                                   3 3                        4  3
bivittata               2101121011100100042010010001100020010200010001000110011211001021O1
                          3 2      3 3        1 1     1          1  1   1
                            3
hirsuta                 2101211011100300042010011001100020010200010001000010000211010101l1
                             34      2          1     3 1      3 12        1   1
                                     3
lutea                   0001341011100300042010111001101020010200010001000010000211101l1???
                         1
rupta                   2001211011100200042010110000100020010200200001010010000211100112O1
                          1  34       3          1  1         4   1
cornelli                2001311011100300042011111001101020010200010001000000000211100l1???
                                                                                    1
nr. furcifer            2000341011100300042010000000100010010000000000000000000000????????301
                                                                                  1
furcifer                2001011011100300042010100000000011010000200000010010000211100112O1
                          1  24                  1  1         4   1
septemdigitata          0001111011100300042010100000000011010000200000010010000211100112O1
                        2   34                   1  1         4 131
quadristriata           0101001011000000042010000000000011010000000101010010010210000021O1
                        2 3 1     13 3       1     11           11            1     2
                                                               2
```

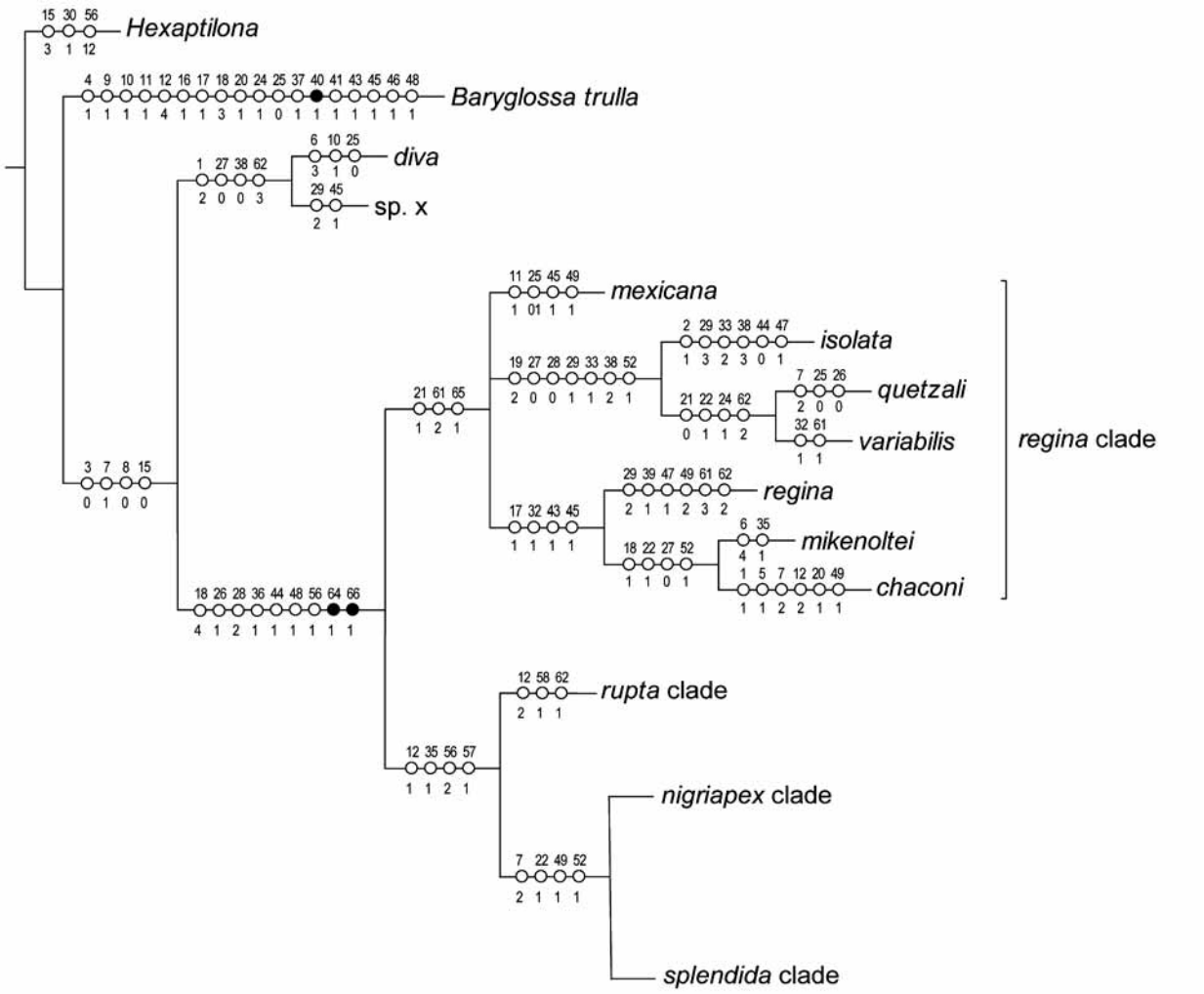


FIGURE 219. Relationships among clades of the *femoralis* group and among species within the *regina* clade. This and the clades in Figures 220–221 are the strict consensus of 72 trees resulting from analysis of the matrix in Table 2. Character state changes, excluding infraspecific variation, are plotted assuming slow optimization. Hollow hashmarks represent homoplasious character state changes.

The relationship among the three remaining clades is not well resolved. Support for the closer relationhip of the *nigriapex* and *splendida* clades as the sister group of the *rupta* clade is based mainly on the presence of the anterolateral spot on abdominal tergites 3–5 (char. 52), which is the only unambiguous synapomorphy. This character also varies within the *regina* clade, however. Several other character states, such as the large size of the hyaline medial areas in cell dm (char. 49.1) (assuming homoplasy within the *regina* clade), the presence of brown markings on the anepisternum (char. 15.1) (assuming reversal in *B. macwilliamsae*), or the presence of a second medial marginal hyaline spot in cell cu_1 (char. 47) (assuming reversal in most of the *splendida* clade), can also be interpreted as a synapomorphies depending upon the character optimization.

The *regina* clade (Fig. 219) includes *B. chaconi*, *isolata*, *mexicana*, *mikenoltei*, *quetzali*, *regina*, and *variabilis*. These species are so far known only from Mesoamerica (Mexico to Costa Rica). Monophyly of this clade is supported mainly by the broad shallow medial apical concavity on the aculeus (char. 61.2) (assumes further change in this character in *B. regina* and *variabilis* and homoplasy in a few species of the *nigriapex* and *rupta* clades) and the reduced size of the lateral prensiseta (char. 65.1) (assumes homoplasy in *B. bidigitata* and *hirsuta* within the *rupta* clade). Relationships within the *regina* clade are not fully resolved, but two subclades are recognized. *Blepharoneura quetzali* and *variabilis* appear to be sister species, perhaps most closely related to *B. isolata*, for which genitalic characters remain unknown. Among the synapomorphies for these species are the presence of subapical hyaline wing bands in cells r_{4+5} and m (characters 33 and 38), and for *B. quetzali* and *variabilis* the

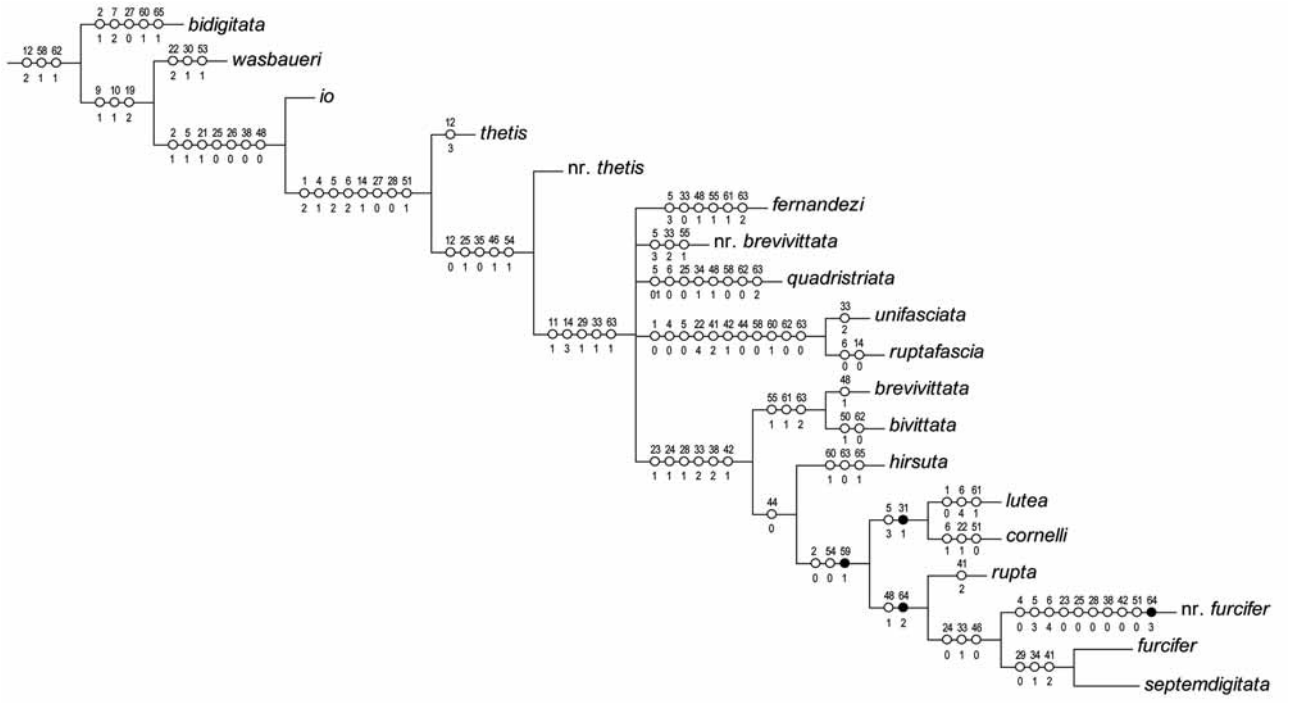


FIGURE 220. Relationships among species of the *rupta* clade. See Fig. 219 for additional details.

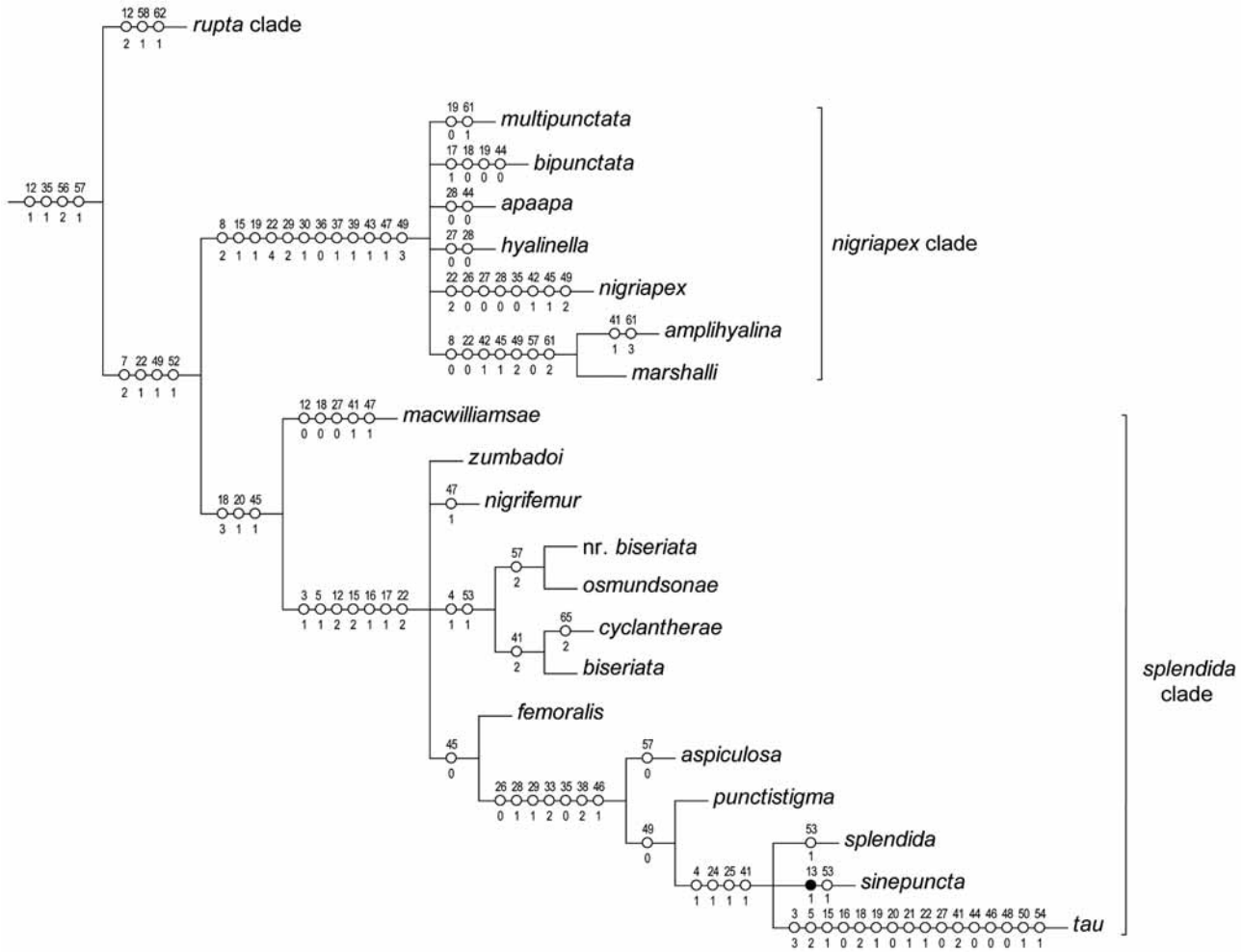


FIGURE 221. Relationships among species of the *nigriapex* and *splendida* clades. See Fig. 219 for additional details.

TABLE 3. Informal classification of species of the *Blepharoneura femoralis* group.

***nigriapex* clade**
B. amplihyalina
B. apaapa
B. bipunctata
B. hyalinella
B. marshalli
B. multipunctata
B. nigriapex

***regina* clade**
B. chaconi
B. isolata
B. mexicana
B. mikenoltei
B. quetzali
B. regina
B. variabilis

***rupta* clade**
B. bidigitata
B. bivittata
B. brevivittata
B. sp. nr. *brevivittata*
B. cornelli
B. fernandezi
B. furcifer
B. sp. nr. *furcifer*
B. hirsuta
B. io
B. lutea
B. quadristriata
B. rupta
B. ruptafascia
B. septemdigitata
B. thetis
B. sp. nr. *thetis*
B. unifasciata
B. wasbaueri

***splendida* clade**
B. aspiculosa
B. biseriata
B. cyclantherae
B. femoralis
B. nigrifemur
B. macwilliamsae
B. osmundsonae
B. punctistigma
B. sinepuncta
B. splendida
B. tau
B. zumbadoi

loss of the hyaline spot in the pterostigma (char. 24) and the marginal serrations on the aculeus (char. 62.2) (also present in *B. regina*). The second subclade, including *B. regina*, *mikenoltei*, and *chaconi*, is weakly supported by the presence of a spot on the anepimeron (char. 17), which is variable in *B. mexicana*, *quetzali* and *variabilis*, the large size of the spot [#15] near crossvein dm-cu (char. 32), which also occurs in *B. variabilis*, and presence of a posterior subapical hyaline spot [#53] in cell dm (char. 43), which is variable in *B. mexicana*.

The *rupta* clade (Fig. 220) includes *B. bidigitata*, *bivittata*, *brevivittata*, sp. nr. *brevivittata*, *cornelli*, *fernandezi*, *furcifer*, sp. nr. *furcifer*, *hirsuta*, *io*, *lutea*, *quadristriata*, *rupta*, *ruptafascia*, *septemdigitata*, *thetis*, sp. nr. *thetis*, *unifasciata*, and *wasbaueri*. It is the most widespread clade within the *femoralis* group, generally occurring at lower elevations than the species of the other clades. Support for the *rupta* clade is based mainly on the presence of a digitate lateral lobe on the aculeus (char. 58) (assumes reversal in *B. quadristriata*, *ruptafascia*, and *unifasciata*). The presence of minute serrations on this lobe (char. 62.1) can also be interpreted as a synapomorphy (assumes reversal in the above 3 species and *B. bivittata*). The majority of species within the *rupta* clade (except *B. bidigitata*, *io*, and *wasbaueri*) form a well supported subclade with the following synapomorphies: vertex with brown marking surrounding medial vertical seta (char. 1.2) (assumes reversal in *B. lutea*, *ruptafascia*, and *unifasciata*); scutum with large nonmicrotrichose area (char. 4) (assumes reversal in *B. ruptafascia*, *unifasciata* and sp. nr. *furcifer*); scutum with posterior brown mark trapezoidal, triangular, or a narrow band (char. 5.2) and with medial brown vitta (char. 6.1) (both characters with subsequent change in some species); subscutellum without brown vittae (char. 14.1); and abdominal markings more or less vittate (char. 51). Most species of this large subclade (except *B. fernandezi*, *thetis*, sp. nr. *thetis*, and some *B. quadristriata*) have subapical wing bands (char. 33.1–2). Within this subclade *B. bivittata*, *brevivittata*, *cornelli*, *furcifer*, *hirsuta*, *lutea*, *rupta*, and *septemdigitata* form a further subclade supported by the shape of the hyaline area(s) in cell c (char. 23), unique to these species (assumes reversal in sp. nr. *furcifer*; also variable in *B. bivittata* and *hirsuta*); the loss of the hyaline spot in the pterostigma (char. 24) (assumes reversal in *furcifer*, sp. nr. *furcifer* and *septemdigitata*); cell r_{2+3} medially with only one spot (char. 28.1); cells r_{2+3} and r_{4+5} with convex subapical band (char. 33.2) (assumes reversal to state 1, with concave subapical band, in *furcifer*, sp. nr. *furcifer* and *septemdigitata*); and cell dm without subapical spot [#25] (assumes reversal in at least sp. nr. *furcifer*).

The *nigriapex* clade (Fig. 221) includes *B. amplihyalina*, *apaapa*, *bipunctata*, *hyalinella*, *marshalli*, *multipunctata*, and *nigriapex*. These species are so far known only from Andean countries (Ecuador, Bolivia, and northwestern Argentina). Support for the *nigriapex* clade includes, among other character states, the presence of additional hyaline spots in the apical part of cell r_1 (char. 29.2) and additional tiny spots in cells r_{2+3} and r_{4+5} (char. 30) (both assuming reversal in *B. amplihyalina* and *marshalli*), the presence (char. 36.0) and large size (char. 37) of the median marginal spot in cell m (the latter unique to this clade, although variable within *B. hyalinella*), the subbasal medial hyaline spot in cell m (char. 39) (variable in *B. amplihyalina* and *marshalli*), the posterior subapical hyaline spot [#53] in cell dm (char. 43) (variable in *B. apaapa*, *amplihyalina* and *marshalli*), and the reduced medial hyaline area in cell dm (char. 49.3) (assumes further change to extremely large (char. 49.2) in *B. nigriapex*, *amplihyalina* and *marshalli*). Other character states that can be interpreted as synapomorphies include the single medial spot on the scutellum (char. 12.1) (unique to this clade), the posterodorsal spot on the anepisternum (char. 15.1) (otherwise present only in *B. tau*), and the additional marginal hyaline spot in cell cu_1 (char. 47). Relationships within the *nigriapex* clade are unresolved, except the two Argentine species, *B. amplihyalina* and *marshalli*, are sister species.

The *splendida* clade (Fig. 221) includes *B. aspiculosa*, *biseriata*, sp. nr. *biseriata*, *cyclantherae*, *femoralis*, *macwilliamsae*, *nigrifemur*, *osmundsonae*, *punctistigma*, *sinepuncta*, *splendida*, *tau* and *zumbadoi*. This group is predominantly Mesoamerican except for *B. nigrifemur*, from Bolivia, and *B. femoralis* and *splendida*, which range into South America. Support for inclusion of *B. macwilliamsae* in the *splendida* clade is weak. The only unambiguous synapomorphy for the entire clade is the presence of brown marking on the meron (char. 20) (assumes reversal in *B. tau* and homoplasy in *B. chaconi* and *regina*). The species other than *B. macwilliamsae* form a subgroup strongly supported by the following synapomorphies: head with brown band or triangular marking lateral to occipital suture (char. 3.1); scutum posterior brown mark bimodal (char. 5.1);

and anepisternum with large medial brown spot or mostly brown (char. 15.2). Hind femur color (entire apical sixth or more brown; char. 22.2) can also be interpreted as a synapomorphy for this subclade. Within this group, the species with subapical wing bands (*B. aspiculosa*, *punctistigma*, *sinepuncta*, *splendida*, and *tau*) are recognized as a subclade based on a suite of wing characters, including the shape of the basal marginal hyaline spot [#5] in cell r_1 (char. 26.0) (reversal), apical part of cell r_1 without hyaline spot (char. 29.1) (variable in some species), cells r_{2+3}, r_{4+5} and m with subapical bands (characters 33.2, 38.2), cell r_{4+5} with only one marginal hyaline mark (char. 35.0) (reversal), and cell cu_1 with anterior hyaline spot [#32] aligned with proximal marginal spot [#34]. *Blepharoneura tau* was included in the *splendida* clade based mainly on its wing pattern resemblance to *B. splendida* and similar species, but it lacks the dark markings on the occiput, thoracic pleuron, and hind femur that otherwise characterize the *splendida* clade and its largest subclade, and its inclusion is therefore suspect. Discovery of the female may help to clarify its relationships.

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