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Four new species of *Euphyllodromia* (Ectobiidae, Pseudophyllodromiinae) from the Amazon region (Brazil) and description of the genitalia of *E. amazonensis* Rocha e Silva, 1984

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LOPES, S.M. & SILVA, L.O.C. **Four new species of *Euphyllodromia* (Ectobiidae, Pseudophyllodromiinae) from the Amazon region (Brazil) and description of the genitalia of *E. amazonensis* Rocha e Silva, 1984.** *Biota Neotrop.* 12(4): <http://www.biotaneotropica.org.br/v12n4/en/abstract?article+bn00212042012>

Abstract: Four new species of *Euphyllodromia* Shelford, 1908 (*E. spathulata*, *E. nigromaculata*, *E. neoelegans* and *E. spiculata*) are described. Their male genitalia are illustrated. The female genitalia of *E. spiculata* and *E. nigromaculata* are also illustrated. Diagnostic characters of the head, thorax and abdomen of *E. amazonensis* Rocha e Silva, 1984 are reiterated, illustrated and combined with the description of the male and female genitalia for the first time. A key is provided to include the species treated here.

Keywords: Amazonas, Blattaria, key, taxonomy.

LOPES, S.M. & SILVA, L.O.C. **Quatro novas espécies de *Euphyllodromia* (Ectobiidae, Pseudophyllodromiinae) da região amazônica (Brasil) e descrição da genitália de *E. amazonensis* Rocha e Silva, 1984.** *Biota Neotrop.* 12(4): <http://www.biotaneotropica.org.br/v12n4/pt/abstract?article+bn00212042012>

Resumo: Quatro novas espécies de *Euphyllodromia* Shelford, 1908 (*E. spathulata*, *E. nigromaculata*, *E. neoelegans* e *E. spiculata*) são descritas. As genitálias do macho das mesmas são ilustradas. A genitália da fêmea de *E. spiculata* e *E. nigromaculata* são também ilustradas. Caracteres diagnósticos de cabeça, tórax e abdômen de *E. amazonensis* Rocha e Silva, 1984 são redescritos, ilustrados e associados com a descrição da genitália do macho e da fêmea descritos pela primeira vez. Uma chave inclui as espécies aqui mencionadas.

Palavras-chave: Amazonas, Blattaria, chave, taxonomia.

Introduction

Shelford (1908) described *Euphyllodromia* and considered it as a subgenus of *Pseudophyllodromia* Brunner, 1865, based on the morphology of the tegmen and the geographical distribution of the group. Hebard (1920) confirmed the validity of the genus and designated the type species *E. angustata* (Latreille, 1807).

Princis (1951) described six new species for Venezuela, among which was included *Euphyllodromia venezuelica* and in 1969 cited a total of 29 species for the genus in the Neotropical region, from the southwestern United States to Bolivia, with the highest incidence in the Amazon basin.

Rocha e Silva (1956) redescribed *E. peruana* (Saussure, 1864) and added other species to the genus (*E. travassosi*) making it similar to *E. albomaculata* (Shelford, 1909) and drawing on the coloration of the head, pronotum, legs and abdomen as well as the arrangement of the veins in the tegmen.

Bonfils (1975) distinguished ten species within the genus, four of which were recorded from French Guiana [*E. atropos* Rehn, 1928, *E. aurora* Rehn, 1932, *E. elegans* (Shelford, 1907) and *E. pavonacea* (Rehn, 1903)].

Rocha e Silva (1984) revised the genus and described three more species (*E. amazonensis*, *E. jutai* and *E. maturaca*). She also reported new occurrences of members of the genus in Peru and the Brazilian Amazon basin.

Ramírez Pérez (1993), in a revision of the genera of Venezuelan cockroaches, presented a key to the known species and described three new species: *E. fernandesi*, *E. osunai* and *E. cerdai*.

Lopes et al. (2007) described a new species (*E. rondonensis*) and reported a new occurrence for *E. jugata* Rehn, 1928, collected in a wasp nest in the state of Acre, Brazil.

Anisyutkin (2011) reviewed the genus *Euphyllodromia* and described three new species (*E. propinqua* sp. nov., *E. rasnitsyni* sp. nov. and *E. tingomariensis* sp. nov.) and a first fossil representative from the Colombian Copal (Pleistocene-Holocene) (*E. cf. angustata*).

Beccaloni (2012) listed thirty-four species for the genus in his catalog on the internet.

Currently, the genus includes thirty-seven species. It is a neotropical genus and in Brazil was only occurrence in the Amazon region.

Euphyllodromia is included in the family Ectobiidae, subfamily Pseudophyllodromiinae, characterized by having the phallomere hooked on the right side in dorsal view. The genus is characterized as being small in size (11 to 19 mm) having a remarkable pigmentation. Triangular head with salient eyes and small ocelli; a transverse pronotum, little-deflected lateral margins; little marked oblique grooves on the disk. Developed tegmina and wings. Legs with anteroventral margin of front femur showing few spines, being stronger on the basal half, followed by a thick row of minor spines and having three strong and elongated spines on the apex; pulvilli are present only on the fourth tarsal article; simple arolia and nails.

The present paper describes and illustrates the male genitalia of five species and the female of one of these, as well as three new species from the state of Amazonas. The genitalia and some morphological characters not shown in the original description of *E. amazonensis* Rocha e Silva, 1984 are described and illustrated.

Materials and Methods

The morphology of the specimens was analyzed according to the standard techniques as described by Lopes & Oliveira (2000). The terms for the genital parts, the basic literature and the taxonomic classification were based on the concepts proposed by Roth (2003) and Beccaloni & Eggleton (2011), and the phylogenetic position

referring to the subfamily Pseudophyllodromiinae drew upon Klass & Meier (2006). After analysis, the plates and the genital parts were stored in a microvial containing glycerin and together with their respective pinned specimen, a method developed by Gurney et al. (1964). They were analyzed based on the literature, and the material was deposited in the Blattaria collection of the Museu Nacional from Rio de Janeiro. The text was translated by Professor Solange Garrido and edited by Dr. Janet W. Reid.

1. *Euphyllodromia neoelegans* sp. nov. (Figures 1-10)

Etymology: From Latin “neo”, new. The name refers to the similarity to *E. elegans*.

Comparison: The species is closest to *E. elegans* (Shelford, 1907), *E. jugata* Rehn, 1928 and *E. atropos* Rehn, 1928, differing from them in the coloration of the spot on the pronotum and the configuration of the styles and subgenital plate.

Description: General coloration glossy brown. Head ferruginous, lightening toward clypeus (Figure 1). Antennae dark with beige base. Palpi with slightly darker ventral region. Pronotum light-colored with blackened spot on central disk (Figure 2). Tegmina and wings with dark-brown veins. Legs yellowish brown, insertion of spines dark brown.

Dimensions (mm). Holotype ♂. Total length 13.0; pronotum length 2.5, width 4.0; tegmen length 10.0, width 2.0.

Head elongated and triangular. The vertex is shown beneath the pronotum in dorsal view. Interocular space ample, measuring about three-quarters of area between antennal sockets. Antennae long, overreaching edge of abdomen. Maxillary palpi with first and second articles small, third article equal to interocular space in size; fourth article equal to area between antennal sockets in size; fifth article dilated and tomentose, shorter than third article.

Thorax with short wide pronotum, ample lateral edges with circular outline laterally. Legs long and acute. Anteroventral margin of fore femur with three irregular spines on basal half, followed by median spine and row of small stout spines on apical half, ending in three long robust apical spines. Posteroventral margin with robust spine on apical half. Tibia spiny. Tarsus with only fourth segment showing an evident pulvillus. Nails long and simple arolium present but little developed. Tegmen long, overreaching apex of abdomen. Marginal field slightly concave, short and well marked; slightly convex scapular field, discoidal field with longitudinal veins.

Abdomen with tergal modification on sixth segment medially concentrated in the form of a tuft of bristles (Figure 3). Supraanal plate narrow with bristles on apical edge; cerci short and tomentose (Figure 4). Subgenital plate oblong with small, slightly asymmetrical laminate styles, inserted medially on apical edge with bristles, and between the two styles is a projection with small sclerotized spines (Figure 5); left phallomere with two asymmetrical projections, one of these reduced and rounded (Figure 6); sclerite with ciliated apex (Figure 7); median sclerite acute with rounded apex (Figures 8 and 9); right phallomere hooklike (Figure 10).

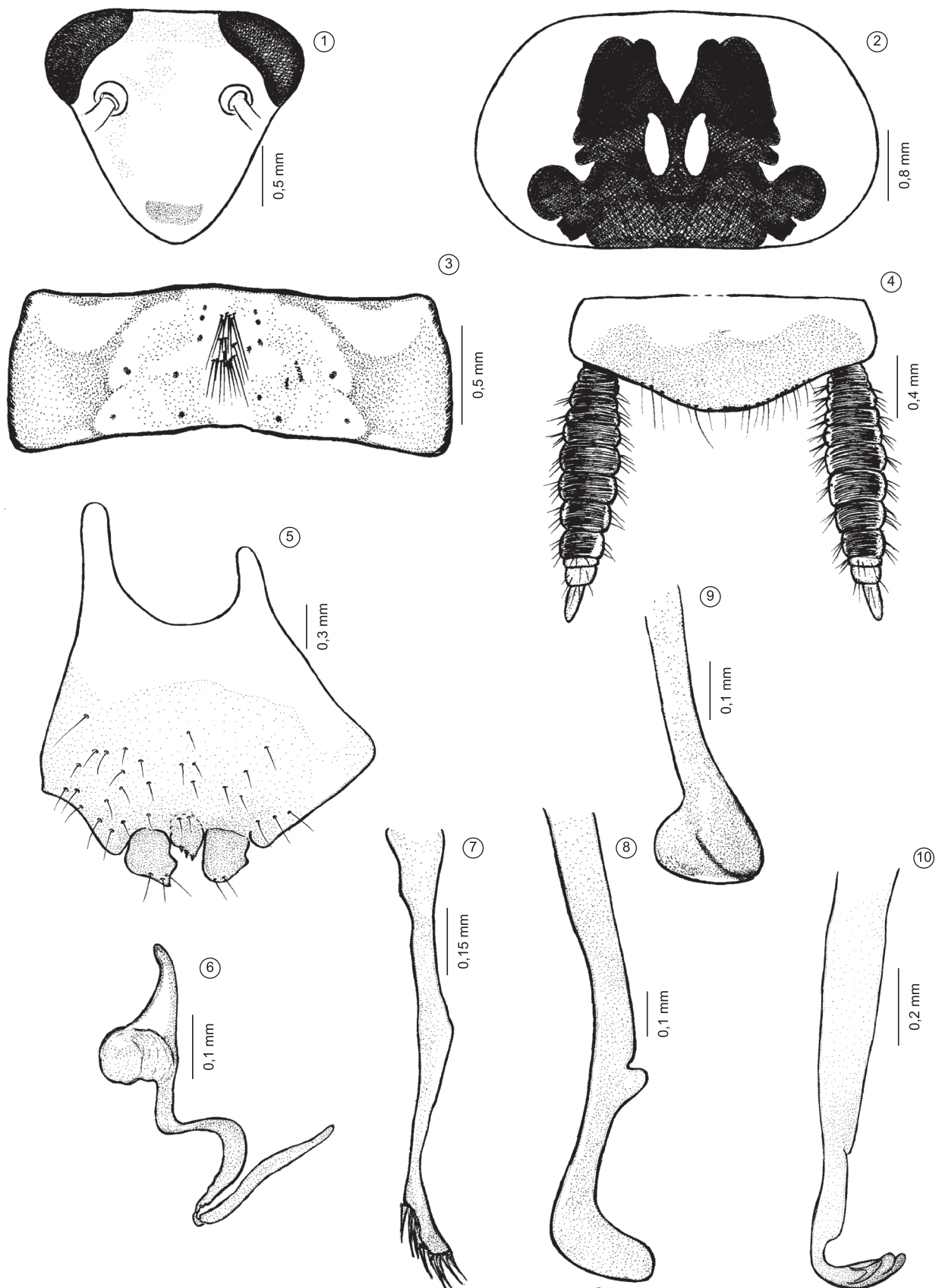
Type material: Holotype ♂. Brazil: Amazonas, Guajara, Ipixuna River, 7° 06' 39" S / 73° 05' 25" W, 13-19/VI/1995 (in a malaise trap), P. Burnheim and N. O. Aguiar cols.

2. *Euphyllodromia nigromaculata* sp. nov. (Figures 11-20)

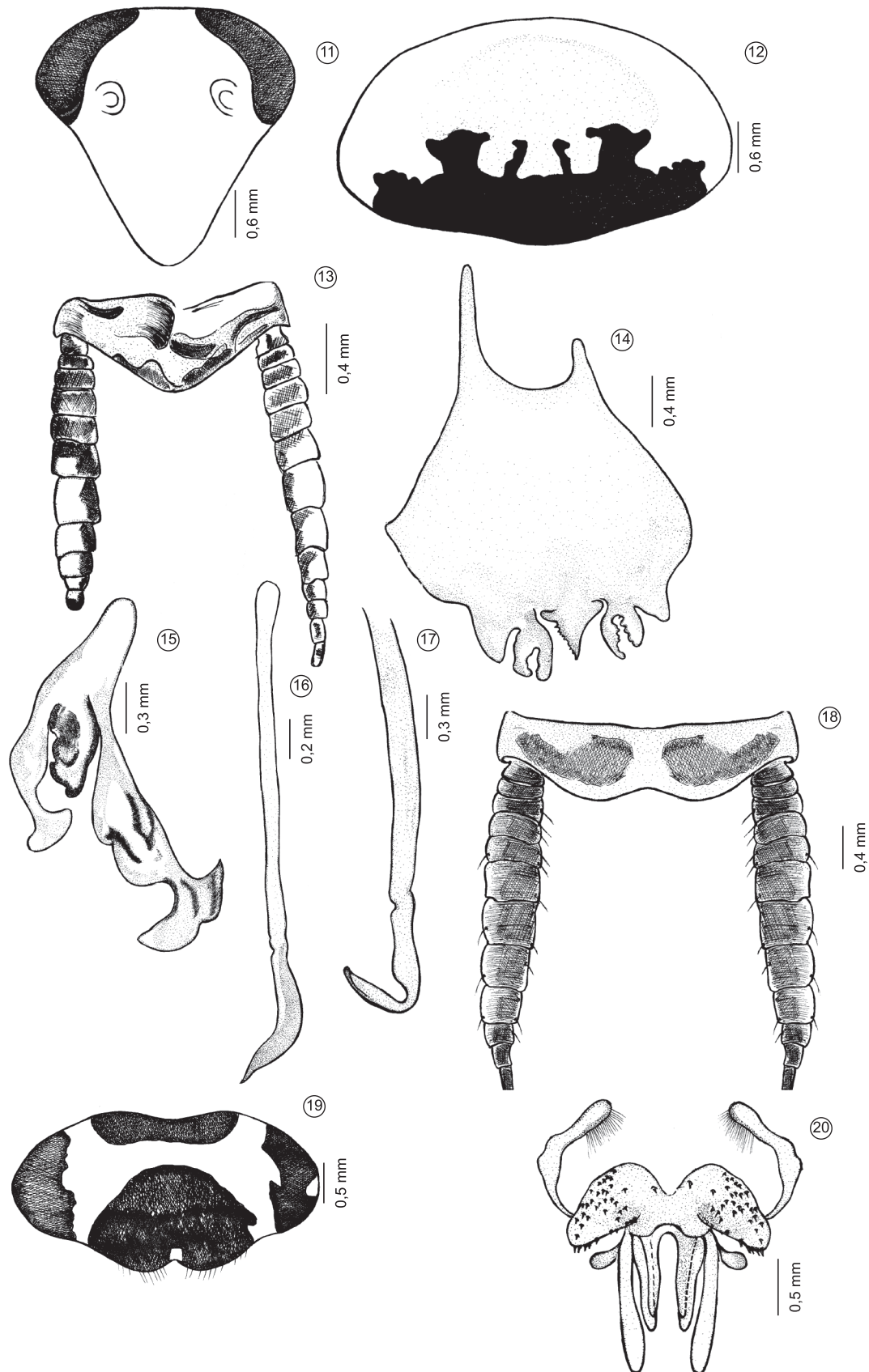
Etymology: From Latin “nigro”, black; and “maculata”, spot. The name refers to the coloration of the pronotum.

Comparison: Concerning the coloration of the pronotum, the species is similar to *E. chopardi* Hebard, 1921, differing from it in the configuration of the styles on the male subgenital plate.

Description: General coloration glossy brown. Head dark brown (Figure 11), lightening toward clypeus. Dark antennae with beige



Figures 1-10. *Euphyllodromia neoelegans* sp. nov. male holotype 1) head; 2) pronotum; 3) tergal modification in the abdomen; 4) supraanal plate, dorsal view; 5) subgenital plate, ventral view; 6) left phallomere, dorsal view; 7) sclerite; 8 and 9) median sclerite, dorsal view; 10) right phallomere.



Figures 11-20. *Euphyllodromia nigromaculata* sp. nov.: male holotype 11) head; 12) pronotum; 13) supraanal plate, dorsal view; 14) subgenital plate, ventral view; 15) left phallomere, dorsal view; 16) median sclerite, dorsal view; 17) right phallomere, dorsal view; female paratype 18) supraanal plate, dorsal view; 19) subgenital plate, ventral view; 20) valves, dorsal view.

base. Pronotum with compact darkened spot on basal half (Figure 12). Tegmina and wings with dark-brown veins. Yellowish-brown legs, with insertion of spines dark brown.

Dimensions (mm). Holotype: ♂. Total length 15.0; pronotum length 2.5, width 4.5; tegmen length 13.0, width 3.2

Head triangular and elongated. The vertex is shown beneath the pronotum in dorsal view. Interocular space measures about half distance between base of antennal sockets. Antennae long, overreaching edge of abdomen. Maxillary palpi with first and second articles small, third article equal to interocular space in size, fourth article equal to area between antennal sockets in size; fifth article dilated and tomentose, shorter than third article.

Thorax with short elongated pronotum, ample with lateral edge having circular lateral outline. Legs long and acute. Fore femur displays three irregular spines on basal half of anteroventral margin, followed by row of small and stout spines on apical half, ending in three long robust apical spines that increase in length. Posteroventral margin with robust spine on apical half. Tibia spiny. Tarsus with only fourth segment showing an evident pulvillus. Long and simple nails with present, but little-developed arolium. Tegmen long, overreaching apex of abdomen. Marginal field slightly concave, short and well marked; slightly convex scapular field, discoidal field with longitudinal veins.

Abdomen with tergal modification on sixth segment, medially concentrated in the form of a row of symmetrical bristles. Supraanal plate narrow, triangular and projecting between the cerci (Figure 13); oblong subgenital plate bearing lateral projections externally to styles, and median projections between triangular styles, tapering apically with row of 10-11 small spines on left margin, styles spatulate and cleaved medio-apically (Figure 14); left phallomere with two apically differentiated, wide arms with sclerotized median structure (Figure 15); median sclerite acute, apically, in the form of a spiniform sickle (Figure 16); right phallomere hook-shaped with preapical incisions (Figure 17).

Dimensions (mm): Paratype: ♀. Total length 19.0; pronotum length 3.0, width 4.0; tegmen length 12.5, width 3.0.

Female – Differs from male in having narrow supra-anal plate with slight medial incision apically between the cerci. Cerci long and wide (Figure 18). Subgenital plate ample, with slight medial incision apically (Figure 19). Valve complex developed, first pair of valves well developed, second and third pairs differing little in size and shape (Figure 20).

Type Material: Holotype ♂. Brazil: Amazonas, Coari, Urucu River LUC-18, 4° 53' 53" S/ 65° 11' 58" W, 19/II-01/III/1993, P. Bührnheim et al. col.; Paratype ♂, same data, RUC-36, 4° 55' 53" S/ 65° 18' 13" W, 25/II-10/III/1995, P. Bührnheim et al. col.; Paratype ♂, same data, Petrobrás RUC-29, 5-10/II/1992, P. Bührnheim, N.O. Aguiar & N. Fê cols.; Paratype ♂, same data, LUC-09, 4° 51' 56" S/65° 04' 56" W, 25/I-10/II/1995, P. Bührnheim et al. col.; paratype: ♀, same data, IMT-1, 4° 49' 33" S/65° 01' 49" W, 17-29/IX/1995, P. Bührnheim & N.O. Aguiar cols. (in a Shannon trap).

3. *Euphyllodromia spathulata* sp. nov. (Figures 21-28)

Etymology: From Latin “spatha”, spatula and “latum”, wide. The name refers to the configuration of the styles on the subgenital plate.

Comparison: The species is closest to *E. elegans*, differing from the latter in the coloration on the pronotum and the configuration of the styles and subgenital plate.

Description: General coloration glossy brown. Head ferruginous, lightening toward clypeus (Figure 21). Eyes grayish with brown border. Antenna dark with whitish base. Palpi with darker ventral region. Pronotum with blackened spots on central disk (Figure 22).

Tegmina and wings with dark-brown veins. Legs yellowish brown with brown insertion of spines.

Dimensions (mm). Holotype ♂. Total length 11.0; pronotum length 2.0, width 3.5; tegmen length 9.0, width 2.2.

Head elongated and triangular. The vertex is shown beneath the pronotum in dorsal view. Interocular space ample, measuring about three-quarters of area between antennal sockets. Antennae long, overreaching edge of abdomen. Maxillary palpi with first and second articles small; third article three-quarters as large as interocular space; fourth article three-quarters as large as area between antennal sockets; fifth article dilated and tomentose, shorter than third segment.

Thorax with short wide pronotum, lateral margins ample with circular lateral outline. Tegmen long, overreaching apex of abdomen. Marginal field slightly concave, short and well marked; slightly convex scapular field; discoidal field with longitudinal veins. Legs long and acute. Fore femur with three spines on basal half of anteroventral margin, followed by row of small stout spines on apical half, ending in three increasingly long and robust apical spines. Posteroventral margin with one robust spine on apical half. Tibia spiny. Tarsus with only fourth segment showing pulvilli. Nails long and simple, with little-developed arolium.

Abdomen with tergal modification on sixth segment medially concentrated in the form of a row of symmetrical bristles (Figure 23). Supraanal plate subtriangular with slight median apical projection (Figure 24). Subgenital plate oblong with short spatulate styles, showing between the styles a large projection on the base which tapers toward the apex and has seven spines on the left margin (Figure 25). Left phallomere with arms differing in size and shape, (Figure 26). Sclerite apically acute, with spinelike bristles (Figure 27). Median sclerite tapering, spatulate apically (Figure 28).

Type Material: Holotype ♂. Brazil: Amazonas, Manaus, Estrada AM 010, Km 64, 29/VII/1970, A. Faustino col.; Paratype ♀. Rondônia, Ouro Preto, X/1980, A. C. Domingos col.

4. *Euphyllodromia spiculata* sp. nov. (Figures 29-41)

Etymology: From Latin “spicula”, spine. The name refers to the apical spinelike bristles on the sclerite.

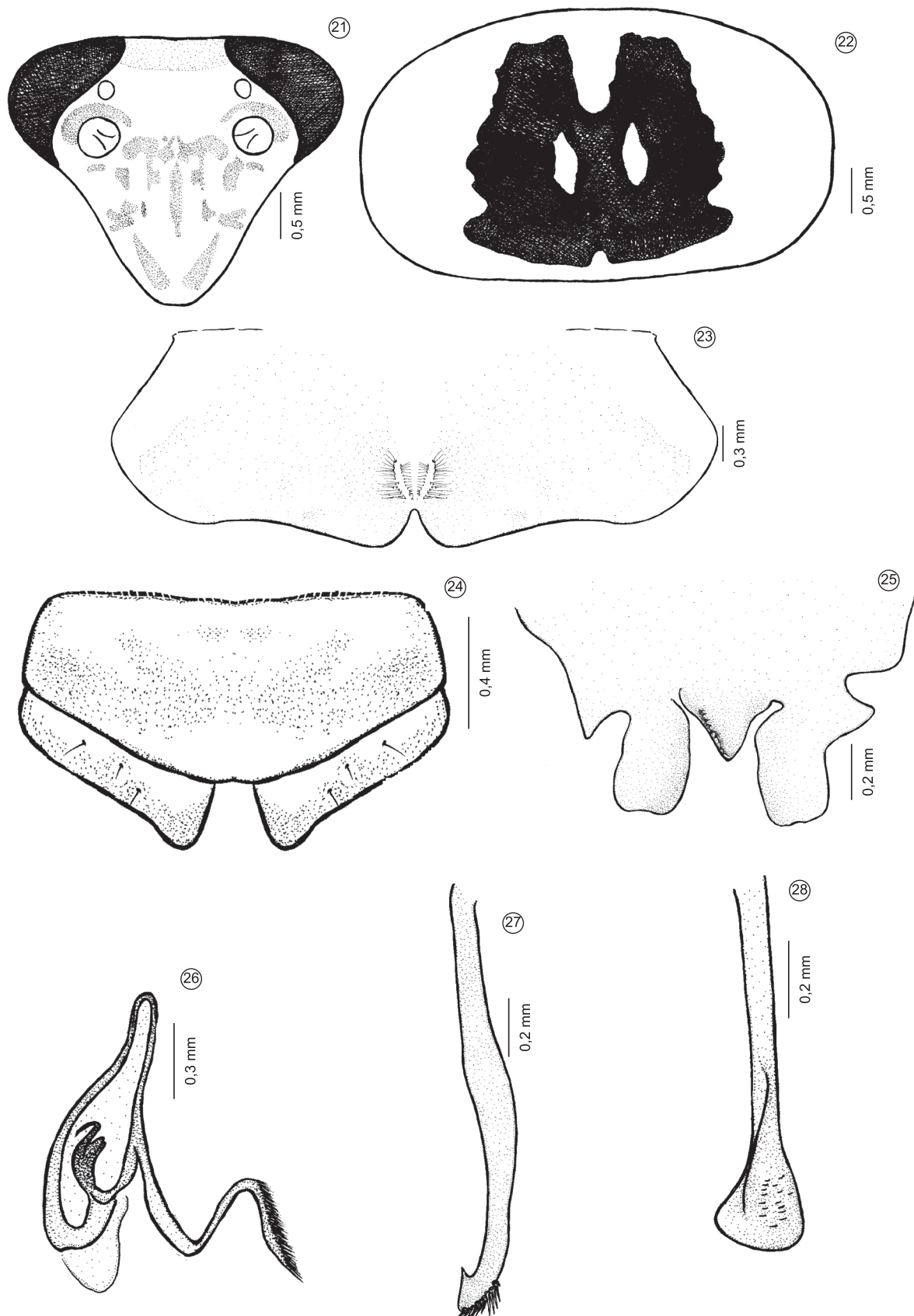
Comparison: The species is similar to *E. variegata* (Walker, 1868) in the coloration of the pronotum, differing from it in the configuration of the supra-anal and subgenital plates and the styles.

Description: General coloration glossy brown. Head brown, yellowish-light brown vertex with four dark-brown, narrow longitudinal stripes (Figure 29). Dark-brown pronotum with two white, longitudinal stripes converging toward apex (Figure 30). Dark eyes with brown outline. Dark-brown antenna with brown base. Yellowish-brown palpi. Tegmina and wings with dark-brown veins and white stripes. Brown legs with dark-brown insertion of spines.

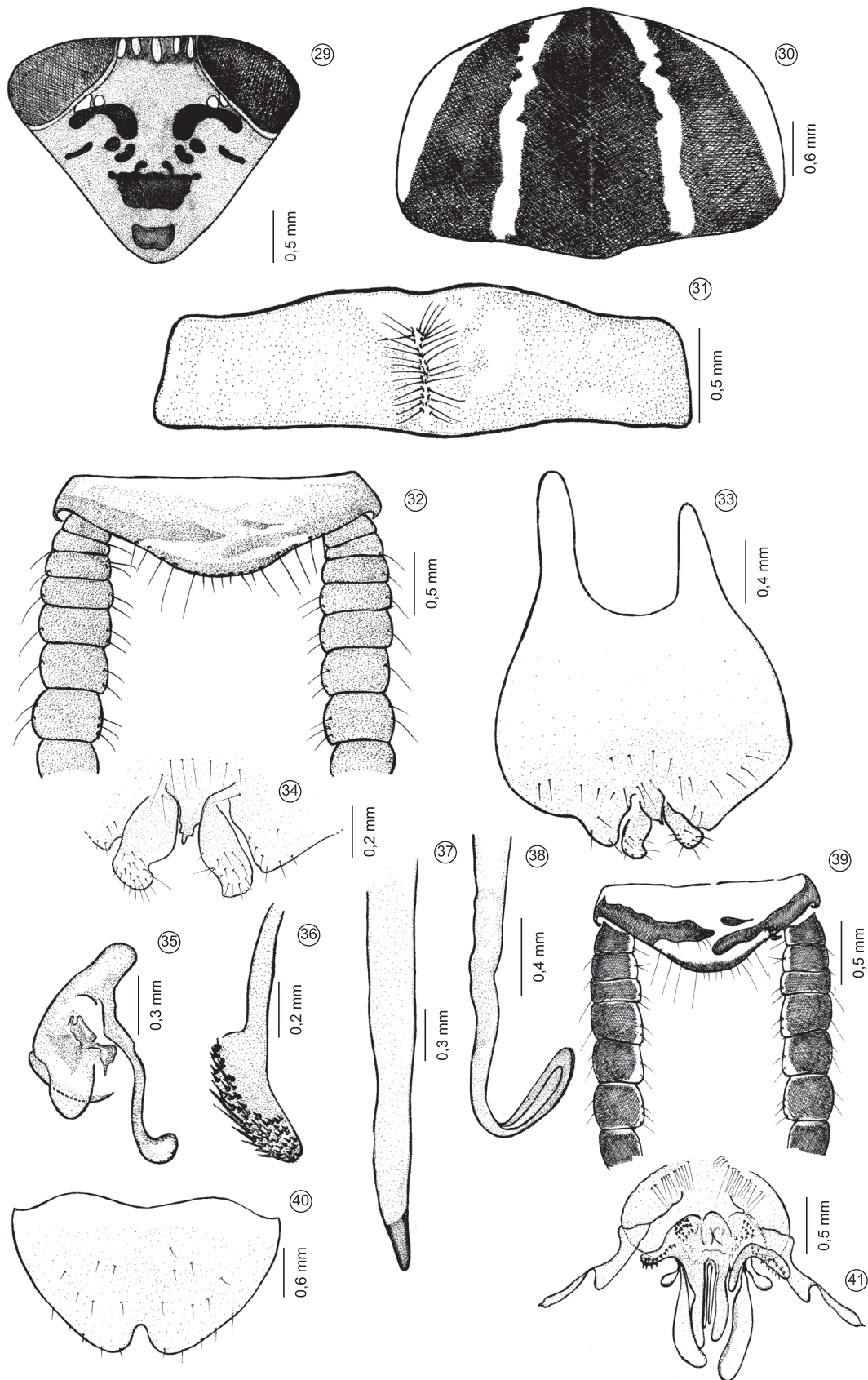
Dimensions (mm). Holotype ♂. Total length 12.0; pronotum length 2.3, width 3.8; tegmen length 9.5, width 2.5.

Head triangular and elongated. The vertex is shown beneath the pronotum in dorsal view. Interocular space ample, measuring about four-fifths of area between antennal sockets. Maxillary palpi with first and second articles small; third and fourth article tomentose and equal to three-quarters of interocular space in size; fifth article dilated and tomentose, shorter than third article.

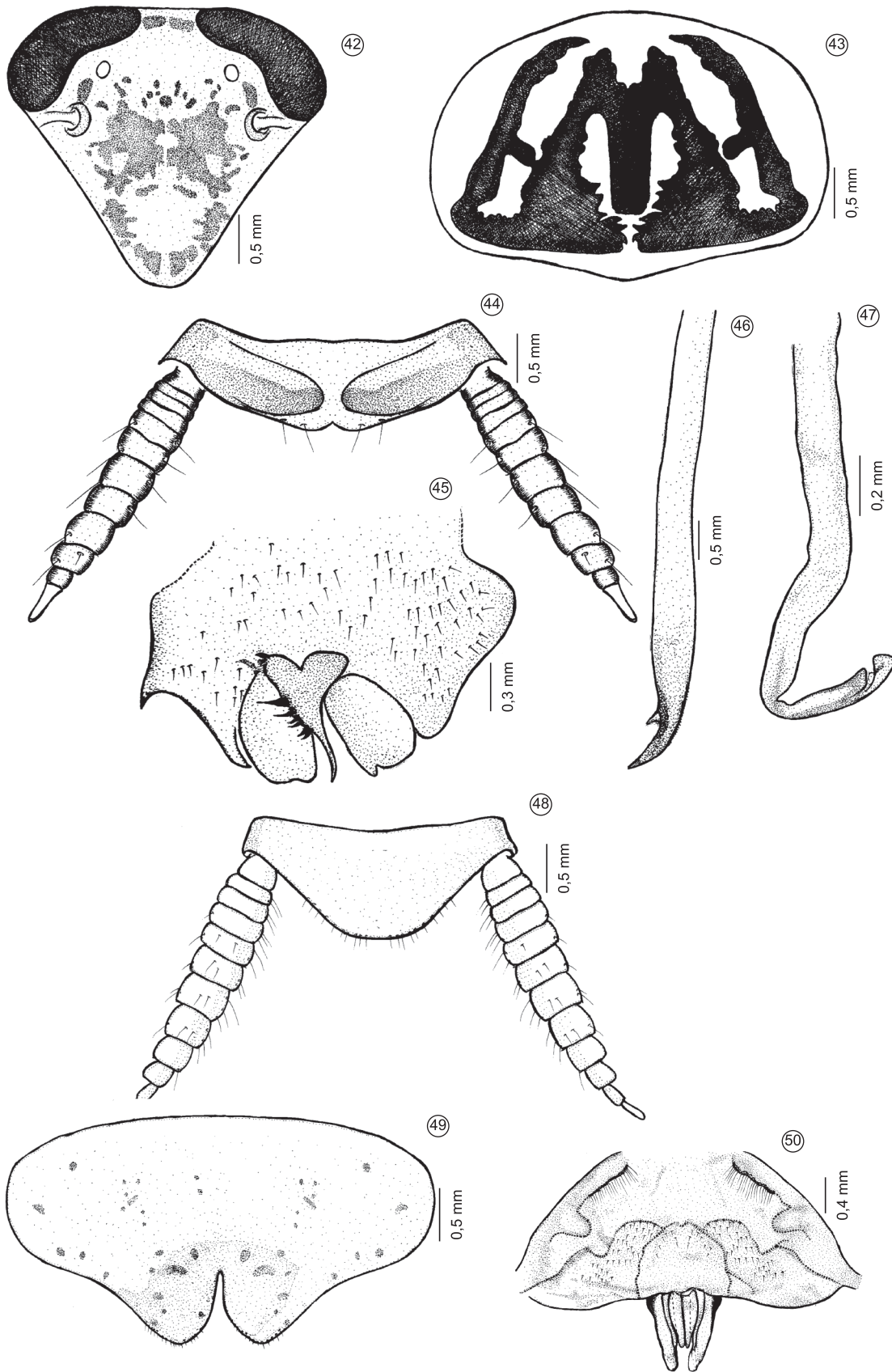
Thorax with short wide pronotum, lateral edges ample with circular lateral outline. Tegmen long, overreaching apex of abdomen. Marginal field slightly concave, short and well-marked; slightly convex scapular field; discoidal field with longitudinal veins. Legs long and acute. Fore femur with about three irregular spines on basal half of anteroventral margin, followed by three spines and a row of small stout spines on apical half, ending in three increasingly long and robust spines on apex. Posteroventral margin with robust spine on apical half. Tibia spiny. Tarsus with only fourth segment showing tiny pulvilli. Nails long and simple with little-developed arolium.



Figures 21-28. *Euphyllodromia spathulata* sp. nov. male holotype 21) head; 22) pronotum; 23) tergal modification in the abdomen; 24) supraanal, plate, dorsal view; 25) subgenital plate, ventral view; 26) left phallomere, dorsal view; 27) sclerite, dorsal view; 28) median sclerite, dorsal view.



Figures 29-41. *Euphyllodromia spiculata* sp. nov. male holotype 29) head; 30) pronotum; 31) tergal modification in the abdomen; 32) supraanal plate, dorsal view; 33) subgenital plate, ventral view; 34) styles on subgenital plate, ventral view; 35) left phallomere, dorsal view; 36) sclerite, dorsal view; 37) median sclerite, dorsal view; 38) right phallomere, dorsal view; paratype female 39) supra-anal plate, dorsal view; 40) subgenital plate, ventral view; 41) valves, dorsal view.



Figures 42-50. *Euphyllodromia amazonensis* Rocha e Silva, 1984: male holotype 42) head; 43) pronotum; 44) supraanal plate, dorsal view; 45) subgenital plate, ventral view; 46) median sclerite, dorsal view; 47) right phallomere, dorsal view; female paratype 48) supraanal plate, dorsal view; 49) subgenital plate, dorsal view; 50) valves, dorsal view.

Abdomen with tergal modification on sixth segment, medially concentrated in the form of a row of symmetrical bristles (Figure 31). Supraanal plate triangular, slightly projecting between cerci, which are tomentose and widened (Figure 32). Subgenital plate with small laminar styles, between them a small and acute projection toward the apex and with strongly sclerotized spines on left margin (Figures 33 and 34). Left phallomere with two asymmetrical arms, one of them larger and rounded and the other reduced; sclerotized median structure (Figure 35); sclerite acute, its apex with several rows of bristles along margin (Figure 36); median sclerite acute, with a more evident spine-like apex (Figure 37); right phallomere hook-shaped with prominent preapical incision (Figure 38).

Dimensions (mm): Paratype ♀. Total length 12.4; pronotum length 2.64, width 3.65; tegmen length 9.2, width 2.58.

Female with triangular supraanal plate with apex projecting between cerci, which are wide and long (Figure 39); subgenital plate ample, split median-apically (Figure 40); valve complex developed; first pair of valves larger than other two pairs; second pair of valves larger and wider than third pair (Figure 41).

Type Material: Holotype ♂. Brazil: Amazonas, Manaus, Est. AM 1, Km 134, 10/VIII/1968, collector unnamed; paratype ♂ same data as holotype; paratype ♀ same data as holotype, Km 135, collector unnamed.

5. *Euphyllodromia amazonensis* Rocha & Silva, 1984 (Figures 42-50)

Diagnosis: In this contribution, we provide illustrations of the head (Figure 42), pronotum (Figure 43), supraanal plate (Figure 44) and subgenital plate (Figure 45),

Type information: Holotype ♂, Brazil: Amazonas, Jutai, no date and collector;

Description: According to Rocha e Silva (1984), *E. amazonensis* is closest to *E. literata* (Burmeister, 1838) in the coloration of the head and pronotum, differing from it in details of coloration and in the male subgenital plate, which has large and spiny styles. We add information on the male and female genitalia to the description.

Male: Median sclerite is sharpened like a spine showing a small pre-apical spine (Figure 46); the right phallomere is hook-shaped with a pre-apical incision (Figure 47).

Female: Supraanal plate well-marked between the cerci. Cerci are long and wide (Figure 48); subgenital plate ample, having a well-marked median-apical incision (Figure 49). First pair of valves is developed, and the second and third pairs are similar in size and shape (Figure 50).

Type Material: Paratype: ♂ Amazonas, Manaus, Parko col., 1941; Paratype: ♀ Reserva Ducke, IV/1966, H. Schubart col.; Paratype: ♀ Laurete, VI/1949, Carvalho col.; Paratype ♀ Manaus, 17/XI/1962, Bechné col.; Paratype: ♀ Manaus, Reserva Ducke, 03/V/1968 E.V. Silva & A. Faustino cols; Paratype: ♂ Manaus, Reserva Ducke, 15/I/1978, O. Rodrigues & A. Soares cols.

Key for the males of the species included here:

1. Pronotum with longitudinal stripes converging toward the apex (Figure 43) 2
- Pronotum with spot on the basal half (Figure 12) 3
- 2(1). Ferruginous head; spines present on the left interstyler projection; interstyler projection with spines; interstyler formation subequal in size to the styles (Figure 45) *E. amazonensis* Rocha e Silva, 1984
- Brown to dark-brown head; spines present on the interstyler projection; interstyler formation smaller than the styles (Figures 33 and 34) *E. spiculata* sp. nov.
- 3(1). Ferruginous head; extended styles 4

Brown to dark-brown head; forked styles (Figure 14) *E. nigromaculata* sp. nov.

4(3). Round interstyler projection (Figure 5) *E. neoelegans* sp. nov.

Acute interstyler projection (Figure 25) *E. spatulata* sp. nov.

Conclusion

For correct identification of the genus *Euphyllodromia* is necessary to identify the structures of the male genitalia, and colours characters are unreliable, because they may indicate intraspecific variation.

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