

# Phylogeny and taxonomic revision of the genus *Euryomma* Stein (Diptera: Calyptratae: Fanniidae)

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## Abstract

The species of genus *Euryomma* is revised, and 16 valid species are recognized. Redescriptions for all species are provided, except for six species recently described from Colombia and Costa Rica for which only differential diagnoses are provided. Illustrations of the male genitalia have been added to Stein's descriptions of *E. rufifrons*, *E. longicorne* and *E. nigrifemur*. The following synonyms are proposed: *Euryomma erythrogaster* Séguéy = *E. longicorne* Stein; *Euryomma tahami* Grisales, Wolff & Carvalho = *E. carioca* Albuquerque; *Euryomma cornuatum* Grisales, Wolff & Carvalho = *E. nigrifemur* Stein; *Euryomma steini* Grisales & Carvalho = *E. palpingens* Wendt. New distribution records are added and maps showing the known distribution of each species are provided, except for the cosmopolitan *E. peregrinum*. An identification key to the species of *Euryomma* is also provided. We propose the first phylogenetic hypothesis for the genus *Euryomma* based on a cladistic analysis using characters from male adult external morphology and male and female terminalia. A cladistic analysis performed using implied weighting shows the genus as a monophyletic group, but relationships among species show little support.

## Key words

*Euryomma*, taxonomic revision, distribution, maps, cladistic analysis.

## 1. Introduction

*Euryomma* Stein is a small genus of the family Fanniidae that contains a total of 20 mostly Neotropical species, with the exception of one Nearctic species and the cosmopolitan *Euryomma peregrinum* Meigen (CHILLCOTT 1961; CARVALHO et al. 2003; GRISALES et al. 2012a; GRISALES et al. 2012b).

Little is known about the biology of *Euryomma*. The larvae of the cosmopolitan *E. peregrinum* have been recorded in rotting plant material, leaf litter or compost, also in living plants already attacked by other invertebrates (ROZKOŠNÝ et al. 1997). They have been also recorded in vertebrate carrion and the adults of this species have been found on pig carrion (ABALLAY et al. 2012).

*Euryomma rettenmeyeri* Chillcott and *Euryomma panamensis* Chillcott were collected in association with colonies of the ant *Eciton burchelli* (Westwood), flying above refuse heaps and both the adults and the larvae were described by CHILLCOTT (1958). GRISALES et al. (2012a,b) described several new species from Colombia and Costa Rica, that were collected on decomposing organic matter, mostly dung and fish traps.

**Taxonomy.** STEIN (1899) erected the genus *Euryomma* for a single nominal species: *Euryomma hispaniense* Stein. STEIN (1907) subsequently synonymised *Euryomma hispaniense* Stein with *Anthomyia peregrina* Meigen, 1826.

Consequently, the type species of the genus *Euryomma* is *Anthomyia peregrina* Meigen, by monotypy.

Among the earliest contributions to the taxonomy of *Euryomma* were the original descriptions of four Chilean and Peruvian species by STEIN (1911) and SÉGUY (1941). ALBUQUERQUE (1956) described a species from Brazil, and a single North American and two species from Panama were later described by CHILLCOTT (1958, 1961). CARVALHO & PAMPLONA (1979) published the first key to the species of *Euryomma* and described a species from Brazil. WENDT & CARVALHO (2007) also presented the description of a new species along with a key for the species occurring in Southern Brazil. The most recent contributions are those of GRISALES et al. (2012a,b) in which nine new species from Colombia and Central America were described.

**Phylogeny.** There are no previous hypotheses for the relationships among the species of *Euryomma*. However, the position of this genus within Fanniidae was discussed by CHILLCOTT (1961), who suggested a sister group relationship with the *Fannia canicularis* species group. HENNIG (1965) presented a list of apomorphies of the family Fanniidae (treated at that time as Fanniinae, a subfamily of Muscidae), and described and discussed many of these characters and their states for the known genera of Fanniidae. HENNIG (1965) considered *Euryomma* a primitive representative of the family more closely related to the *F. canicularis* species-group which he considered a monophyletic group. Similarly, CHILLCOTT (1961), who presented a dendrogram (obtained by cluster analysis) that classified the Fanniidae of the Holarctic region into five genera (*Fannia* Robineau-Desvoidy, *Euryomma*, *Piezura* Rondani, *Platycoenosia* Strobl and *Coelomyia* Haliday) and also showed *Euryomma* at a basal position (*Platycoenosia* was subsequently considered to be a synonym of *Piezura*, and *Coelomyia* a synonym of *Fannia* [PONT 1965; HUCKETT & VOCKEROTH 1987; ROZKOŠNÝ et al. 1997; MOORES & SAVAGE 2005]). In a phylogenetic analysis of the family, DOMÍNGUEZ & ROIG-JUÑENT (2008), in which only *E. peregrinum* was included as representative of the genus *Euryomma*, recovered the latter as the sister group of *Fannia*; both of these genera being apical to all the other genera of the family and this result also agrees with HENNIG'S (1965) and CHILLCOTT'S (1961) hypotheses.

**Aims.** The main aims of this study were: 1) to review the species of the genus *Euryomma*. We were especially interested in the earlier species described by STEIN (1911) and SÉGUY (1941) for which only the original descriptions (without male terminalia illustrations) are available; 2) to develop a hypothesis of phylogenetic relationships among the species of *Euryomma* by means of a cladistic analysis, using male adult external morphological characters and female and male terminalia.

## 2. Methods

### 2.1. Taxonomic work

All known synonyms are provided for each species, as well as a list of generic combinations for the currently valid names.

Species distributions are based on examined material and reliable published records. Countries and localities are given in full for examined specimens.

Measurements are expressed as follows: body length: anterior margin of head (frons), excluding antennae, to apex of abdomen.

For genitalic examination, we followed O'HARA (2002). The abdomen was removed from a dry specimen and heated in 10% KOH for 10–15 minutes. The abdomen was then transferred to acetic acid, and then to glycerine. The postabdominal structures were separated from the rest of the abdomen. Examination and illustration of genitalic structures were done using a compound microscope equipped with a drawing tube. After examination, the genitalia and the rest of the abdomen were placed in glycerine in a plastic microvial and pinned directly under the specimen.

Other illustrations were done using a stereomicroscope. The scale is indicated in each drawing.

### 2.2. Phylogenetic work

#### 2.2.1. Taxon sampling

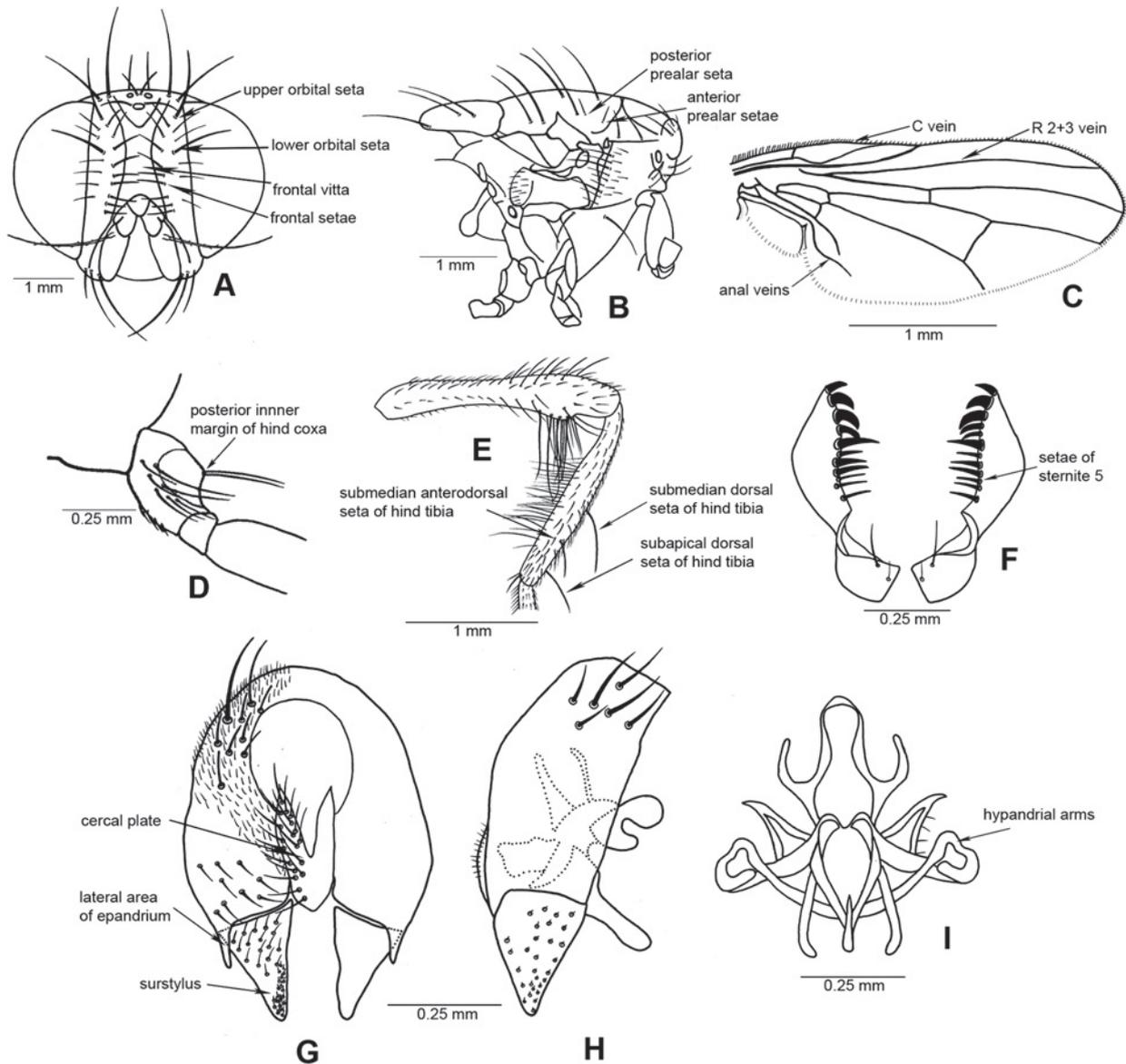
The terminal taxa included 15 valid *Euryomma* species (see results of the revision); *E. campineira* was excluded from the data set since it is only known from the female holotype. The outgroup comprised five species of the genus *Fannia*: *Fannia scalaris* (Fabricius), *F. canicularis* (Linnaeus), *F. pusio* (Wiedemann), *F. femoralis* (Stein), *F. trimaculata* (Stein); one species each from the other genera of the family: *Zealandofannia mystacina* Domínguez & Pont, *Australofannia spiniclunis* Pont and *Piezura graminicola* Zetterstedt; and *Calliphora vicina* Robineau-Desvoidy (Calliphoridae). These outgroup taxa were chosen because we wanted to test the monophyly of the genus *Euryomma*, we were especially interested in CHILLCOTT'S (1961) hypothesis that grouped the genus *Euryomma* with species-groups of the genus *Fannia* such as the *canicularis* species-group; *C. vicina* was chosen because it is more distant from the members of the family Fanniidae than they are from each other, although it was not our aim to test the monophyly of the family.

## 2.2.2. Characters and character states

We coded 75 characters from the male and female adult stage. These were discrete characters, and included: from male head and its appendages (12), male thorax (11), male wings and halteres (3), male legs (22), male abdominal sclerites (4), male terminalia (21), and from the female adult we included characters of the ovipositor (2). Morphological terminology for the cladistics analysis as well as for the taxonomic revision follows MCALPINE (1981), with the exception of ‘pregonite’ (paramere according to MCALPINE 1981) and ‘postgonite’ (gonopod according to MCALPINE 1981). The distribution of states in the terminal taxa is indicated in the data matrix in Table 1.

### Male

0. Head of males: dichoptic = [0]; holoptic = [1].
1. Length of antennae relative to length of face: short, not reaching epistoma = [0]; long, reaching epistoma = [1].
2. Length of pubescence of the arista: longer than arista diameter = [0]; shorter than arista diameter = [1].
3. Pilosity of the eye: absent = [0]; present = [1].
4. Number of frontal setae (Fig. 1A): 2 = [0]; 3 = [1]; 4 = [2]; 13 or more = [3].
5. Upper orbital seta (Fig. 1A): absent = [0]; present = [1].
6. Lower orbital seta (Fig. 1A): absent = [0]; present = [1].
7. Orbital setulae: absent = [0]; short = [1]; long = [2].
8. Number of rows of postocular setae: 2 = [0]; 1 = [1].
9. Parafacial setae: present = [0]; absent = [1].
10. Width of gena relative to width of postpedicel: as broad = [0]; 0.5 to 0.7 = [1]; thin 0.1 to 0.3 = [2]; obsolete from arista downwards = [3].
11. Shape of palpus: thin = [0]; slightly clavate, apex of palpus  $1.5 \times$  width of base = [1]; clavate, apex of palpus  $2 \times$  width of base = [2].
12. Number of vittae of scutum: absent = [0]; 3 = [1]; 5 = [2].
13. Colouring of apex of scutellum: same as scutellum = [0]; other = [1].
14. Rows of acrostichal setae: 2+2 = [0]; 2+3 = [1]; 3+3 = [2]; 3+3–4 = [3].
15. Prescutellar acrostichal seta: absent = [0]; present = [1].
16. First presutural dorsocentral seta: long, as long as second = [0]; short, half as long as second = [1].
17. Number of postsutural intraalar setae: 1 = [0]; 2 = [1].
18. Number of setae of posterior prealar area (anterior to supra-alar seta) (Fig. 1B): absent = [0]; 1 = [1]; 2 = [2]; 4 = [3].
19. Setae of anterior prealar area (next to transverse suture) (Fig. 1B): absent = [0]; present = [1].
20. Setulae of prealar region: absent = [0]; present = [1].
21. Proepimeral setulae: present = [0]; absent = [1].
22. Central setae of katapisternum: absent = [0]; present = [1].
23. Shape of subcostal vein: bent = [0]; straight = [1].
24. Anal veins (Fig. 1C): Imaginary extension of anal veins meeting near wing margin = [1]; first anal vein reduced and second bow-shaped, their imaginary extensions meeting well before wing margins = [2].
25. Wing pattern: translucent = [0]; light brown tinted, with apical third, between C vein and apical half of vein  $R_{2+3}$ , faintly darkened (Fig. 1C) = [1]; smoky brown = [2].
26. Shape of lower calypter: rectangular = [0]; rounded = [1].
27. Posteroventral surface of fore femur: with 3 setae apical = [0]; with a row of setae = [1]; 1 basal seta and 4–5 setae at apical  $\frac{3}{4}$  = [2].
28. Posterior surface of fore femur: with 1 complete row of short setae = [0]; with 2 complete rows of short setae = [1]; with 2 rows of short setae and a third of weak setulae in between = [2]; with 3 rows of setae = [3].
29. Subapical posterodorsal seta of fore tibia: absent = [0]; present = [1].
30. Apical and submedian anterodorsal setae of fore tibia: absent = [0]; present = [1].
31. Anterodorsal row of setae of mid femur: complete = [0]; row only in apical half = [1]; row only in basal half = [2]; absent, except for 2 apical setae = [3].
32. Number of rows of setae of anteroventral surface of mid femur: 1 = [0]; 2 = [1].
33. Posteroventral rows of setae of mid femur: 1 complete row = [0]; 1 row basally, 2 rows in apical half = [1]; 2 rows = [2]; 2 rows basally, 3 in apical half = [3]; 3–4 rows forming a ctenidium = [4].
34. Posterior surface of mid femur: with 1 apical seta = [0]; with 3 apical setae = [1]; 1 complete row = [2].
35. Shape of mid tibia: cone shaped = [0]; constricted in first  $\frac{1}{3}$  = [1]; constricted in first  $\frac{1}{3}$  and with a weak protuberance = [2].
36. Ventral pubescence of mid tibia: absent = [0]; short and less than  $\frac{1}{3} \times$  width mid tibia = [1]; long and more than  $\frac{1}{2} \times$  width of mid tibia = [2].
37. Subapical anterodorsal setae of mid tibia: present = [0]; absent = [1].
38. Setae of anterior surface of mid tibia: absent = [0]; 1 submedian seta = [1]; 1 row of setae in apical half = [2].
39. Number of setae of submedian posterodorsal surface of mid tibia: absent = [0]; 1 = [1]; 2 = [2].
40. Setae at apex of posterior margin of hind coxa (Fig. 1D): absent = [0]; 1 = [1]; 2–3 = [2].
41. Ventral preapical protuberance of hind femur: absent = [0]; present = [1].
42. Anteroventral row of setae of hind femur: row of short setae at base with 2 longer and stronger setae at apex = [0]; row of short setae at base that is gradually longer towards apex = [1].
43. Posteroventral surface of hind femur: setulose = [0]; with 1 row of setae = [1].
44. Submedian and subapical dorsal setae (Fig. 1E): absent = [0]; present = [1].



**Fig. 1.** *Fannia fusconotata* (Rondani): **A:** anterior view of head of female, **B:** lateral view of thorax, **C:** wing. *Fannia pusio* (Wiedemann): **D:** hind coxa, **F:** male hind femur and tibia. *Euryomma longicorne* Stein: **F:** sternite 5, **G:** epandrium ventral, **H:** epandrium lateral, **I:** hypandrium.

45. Median anterodorsal row of setae of hind tibia: present = [0]; absent = [1].
46. Submedian and apical anterodorsal setae of hind tibia (Fig. 1E): present = [0]; absent = [1].
47. Setae of median anteroventral surface of hind tibia: absent = [0]; 1 = [1]; 4–5 = [2]; entirely covered with curled and hair-like setae = [3].
48. Posteroventral row of hind tibia: absent = [0]; present = [1].
49. Shape of abdomen: all segments of equal length except for last that is smaller = [0]; segments short, abdomen truncated = [1]; segments elongated = [2].
50. Colouration pattern of abdomen: dark in central and posterior area of each segment forming a “T” = [0]; uniformly coloured = [1]; tergites 1–3 yellow translucent = [2]; trimaculate = [3].
51. Sternite 1: with few setae = [0]; bare = [1].
52. Sternite 5: divided longitudinally (Fig. 1F) = [0]; not divided = [1].
53. Shape of undivided sternite 5: formed by a single square plate = [0]; “U” shaped = [1]; weakly “U” shaped (apical portions or arms short) = [2].
54. Shape of divided sternite 5: formed by two thin plates with strong setae = [0]; U shaped (Fig. 1F) = [1].
55. Setae of sternite 5: directed towards anterior = [0]; directed inwards (Fig. 1F) = [1]; directed towards ventral = [2]; directed towards posterior = [3]; covering plate = [4].
56. Anterolateral areas of epandrium: longer than surstylus = [0]; median (Fig. 1G) = [1]; short = [2].
57. Cerci of cercal plate: strongly fused, cerci strongly connected along internal margin forming plate = [0]; weakly fused (Fig. 1G) = [1].

**Table 1.** Data matrix for taxa included in phylogenetic analysis.

Taxa	Characters:	000000000	111111111	222222222	333333333	444444444	555555555	666666666	77777
		0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	012345
<i>Calliphora vicina</i>		1000300200	0010000100	0010001140	0010000100	3001000101	1011-40220	021011200-	-11131
<i>Australofannia spiniclusis</i>		0100011110	3100211110	0101100011	1002000120	1000110001	1011-32020	101051100-	-11000
<i>Zealandofannia mystacina</i>		0110210111	3100211010	0011201110	0004101011	0000110100	0010-22010	101000110-	-00011
<i>Piezura graminicola</i>		1000211111	0010211110	0111121111	0314001011	0010100000	1110-41010	101000010-	-10120
<i>Fannia scalaris</i>		1010300011	1020310110	1001201111	1004221112	1001100210	0010-42100	1000100100	?00031
<i>Fannia canicularis</i>		1010310001	1010310130	1101201211	1000201012	2010100102	2010-42100	1000011101	?00020
<i>Fannia pusio</i>		1010300010	2000210110	0101201111	000-222002	2110101302	3010-42100	1010011100	?00130
<i>Fannia trimaculata</i>		1010300000	2000210110	0101201111	0001212012	2110101102	3010-42100	1010011100	?00130
<i>Fannia femoralis</i>		1010300010	2000210110	0101201111	0001212012	2110101102	3010-42100	1010011100	?00130
<i>Euryomma aburrae</i>		0010011110	2111111111	0101101131	0202101011	1001110100	010-000101	1110000111	0110??
<i>Euryomma americanum</i>		0010011110	2111111111	0101101131	0001101011	1000110100	2010-42100	1110000101	?11010
<i>Euryomma carioca</i>		0010011110	2111111111	0101101131	0202101011	1001110100	010-000111	1110000111	111030
<i>Euryomma chillcotti</i>		0011011110	2120111111	?101111101	0102101011	1000110100	110-111110	1110201111	0110??
<i>Euryomma chitarera</i>		0011111110	2110111111	0101101121	0302101011	1000110100	010-122100	1110101111	0110??
<i>Euryomma guane</i>		0101211110	2120311111	0101111101	0104101011	1000110100	010-111100	1110000111	1110??
<i>Euryomma longicorne</i>		0110011110	2101111111	0101101101	0001101011	1000110100	100-111100	1110000111	1110??
<i>Euryomma muisca</i>		0011111110	2110111111	0101101111	0002101011	1000110100	110-112100	1110101111	0110??
<i>Euryomma nigrifemur</i>		0010011111	2020111111	0101101101	0002101011	1000110100	1011-12100	1110102111	0110??
<i>Euryomma palpings</i>		0010010110	2210211111	0101101121	00?2101011	1000110100	2110-42100	1111402111	011030
<i>Euryomma panamensis</i>		0000011110	2020211110	0101101131	0011101011	1000110100	110-011100	1110001111	01-030
<i>Euryomma peregrinum</i>		0010011110	2111211111	0101101131	0010101011	1000110100	200-011111	1110000111	011010
<i>Euryomma rettenmeyerii</i>		0000011110	2010111111	0101101121	0111102011	1000110000	0012-11110	1110300111	011040
<i>Euryomma ruffifrons</i>		0010011210	1020111121	0101101121	1013001012	1000110100	100-111100	1110201111	0110??
<i>Euryomma uwa</i>		0011211110	2120111111	?101111101	0114101011	1000110100	110-111100	1110201111	0110??

58. Length of cercal plate: short (Fig. 1G) = [0]; reaching first ¼ of surstylus = [1]; long, as long as surstylus = [2].
59. Cercal plate with a thin posterior prolongation: absent = [0]; present = [1].
60. Pregonite (gonopods): present = [0]; absent = [1].
61. Postgonites: inconspicuous = [0]; reduced to tiny stubs at side of phallus = [1]; slender and free moving = [2].
62. Baciliform sclerite: present = [0]; absent = [1].
63. Connection of surstyli with epandrium: separate = [0]; connected or continuous with epandrium = [1].
64. Shape of surstylus: triangular (Fig. 1G, H) = [0]; elongated thin = [1]; elongated broad = [2]; oblong = [3]; broad at base, then pointed and curved = [4]; both processes elongated and tapering towards apex = [5].
65. Number of processes forming surstylus: 1 = [0]; 2 = [1].
66. Length of surstylus: shorter than epandrium (Fig. 1G,H) = [0]; as long as epandrium = [1]; longer than epandrium = [2].
67. Ejaculatory apodeme: present = [0]; absent = [1].
68. Medial division of hypandrium: absent = [0]; present = [1].
69. Apex of hypandrial arms (Fig. 1I): directed outwards = [0]; directed inwards = [1].
70. Shape of basal area of arms in divided hypandrium: broad = [0]; thin = [1].
71. Phallus: membranous = [0]; sclerotized = [1].

72. Phallus basally broad and tapered towards apex: absent = [0]; present = [1].
73. Epiphallus: absent = [0]; present = [1].

#### Female

74. Sternite VIII: complete, formed by a rectangular plate = [0]; absent = [1]; formed by 4 small plates = [2]; formed by 2 small plates = [3]; formed by two elongated structures = [4].
75. Number of spermathecae: 2 = [0]; 3 = [1].

#### 2.2.3. Phylogenetic analysis

Characters were treated as unordered and non-applicable characters were coded as ‘-’, whereas unknown character states were coded as ‘?’ (STRONG & LIPSCOMB 1999). We used the program TNT 1.0 (GOLOBOFF et al. 2003) to search for optimal trees using implied weights with a weighting *strength* of K=3. We conducted heuristic, unconstrained searches for optimal trees using tree bisection reconnection (TBR) branch swapping in each of 1000 replications of random taxon addition sequences, maintaining up to 10 trees per replication. A second TBR round was applied to each of the optimal trees, to increase confidence of finding all minimum-length topologies. Zero length branches were collapsed and strict consensus trees were generated. Bremer values, both absolute (BREMER 1994) and relative (GOLOBOFF & FARRIS 2001), were used to estimate the support of groups; we

also used symmetric resampling using 500 replicates ( $P = 0.33$ ) (GOLOBOFF et al. 2003). Bremer supports were calculated by obtaining suboptimal trees in 10 successive stages, saving up to 2000 sub-optimal trees in each stage. In every stage, we searched for suboptimal trees 0.1 units of fit (the fit is a concave function of homoplasy [GOLOBOFF 1993]) longer than the optimal tree (i.e. we searched for trees 0.1–1 units of fit longer than optimal tree). Finally, as recommended by GOLOBOFF & FARRIS (2001), relative support values were calculated by considering only those trees within the absolute Bremer support for each group. Values of group support are indicated at each node. Characters in the text are referred to as numbers with states as superscript (i.e. 2<sup>1</sup>).

### 3. Abbreviations

**Institutions.** CEI – Colección Entomológica, IADIZA, CCT Mendoza, Mendoza, Argentina; CNC – Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Canada; DZUP – Museu de Entomologia Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Brazil; MACN – Museo Argentino de Ciencias Naturales, Bernardino Rivadavia, Buenos Aires, Argentina; MEL – Museo Entomológico de León, León, Nicaragua; NHMW – Naturhistorisches Museum Wien, Vienna, Austria; NMNH – Smithsonian Institution, National Museum of Natural History, Washington D.C., USA; MNHN – Muséum National d'Histoire Naturelle, Paris, France; MNRJ – Museo Nacional de Rio de Janeiro, Rio de Janeiro, Brazil; SMTD – Senckenberg Museum für Tierkunde, Dresden, Germany.

**Morphology.** *Head:* *fr:* frontal seta; *postcl:* postocular seta; *orb:* orbital seta. *Thorax:* *acr:* rows of acrostichal setulae; *acr s:* acrostichal seta; *dc:* dorsocentral seta; *ial:* intra-alar seta; *npl:* notopleuron; *prepm:* proepimeral seta; *pra:* prealar seta; *pprn:* postpronotal seta; *spal:* supraalar seta. *Legs:* *C:* coxa; *F:* femur; *T:* tibia; *a:* anterior seta; *ad:* anterodorsal seta; *av:* anteroventral seta; *d:* dorsal seta; *p:* posterior seta; *p<sub>v</sub>:* posteroventral seta; *pd:* posterodorsal seta; *v:* ventral seta; *ad:* anterodorsal seta.

## 4. Taxonomic revision

### 4.1. Genus *Euryomma* Stein

*Euryomma* Stein, 1899: 19. Type species: *Euryomma hispaniense* Stein, 1899 [= *Anthomyia preregrina* Meigen, 1826], by monotypy.

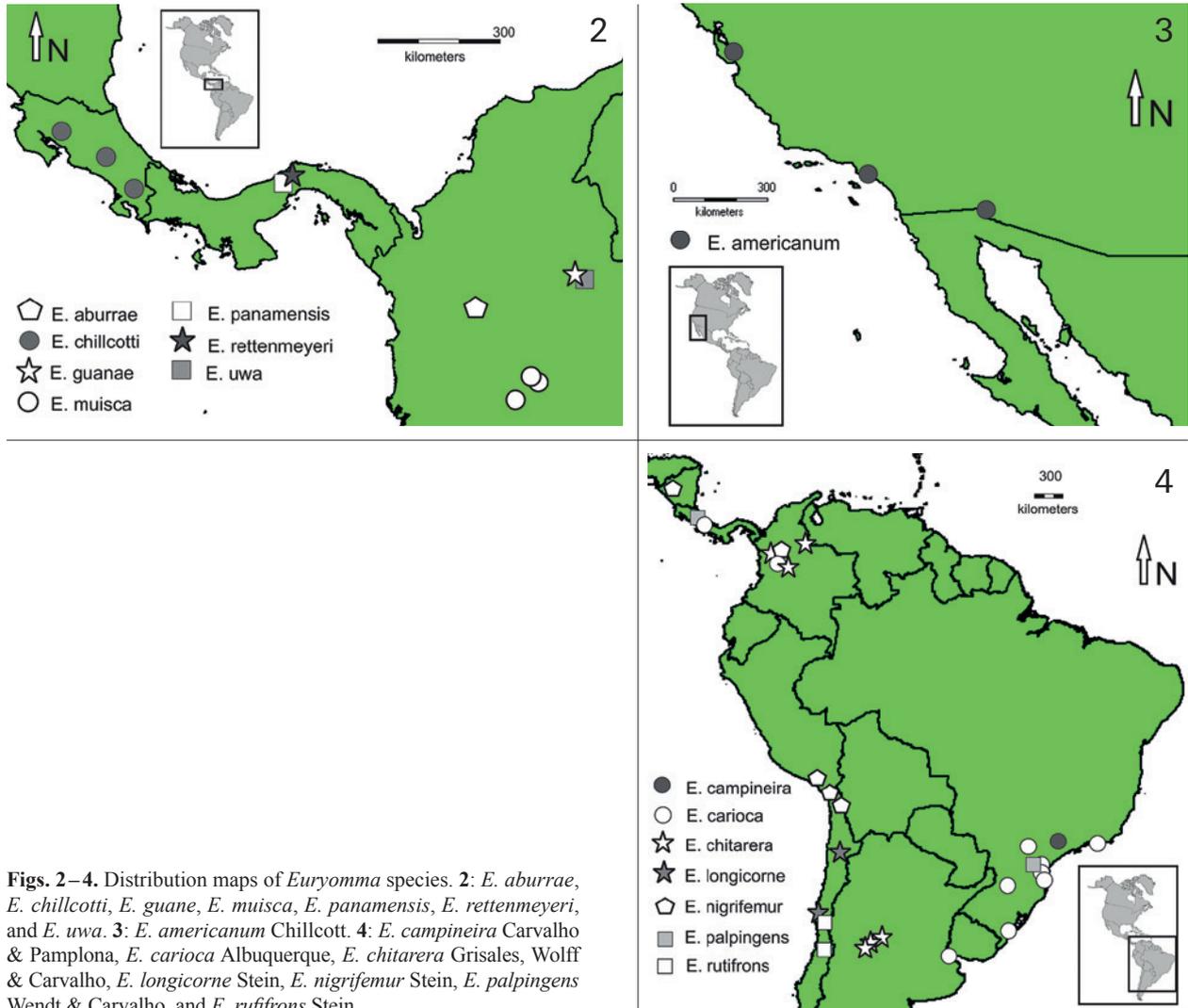
**Diagnosis.** All species of the genus are dichoptic in both sexes, they present very little or no sexual dimorphism; the first of the two presutural *dc* is reduced and hardly

distinct from the ground-setulae; always more than 1 row of setae on posterior surface of fore femur; imaginary extensions of first (A1+CuA2) and second (A2) anal veins meeting before wing margin; cercal plate weakly fused; postgonites reduced to tiny stubs at side of phallus; hypandrium divided medially.

### 4.2. Key to species of *Euryomma*

Seven females of the 16 recognized species of *Euryomma* are unknown (see taxonomic revision). Among the nine species in which the female is known, three do not present sexual dimorphism, five present slight differences with the male (in characters that are not used to separate species in the key, but are indicated in the description section) and in one the male is unknown.

- 1 Hind coxa with 1–2 setae on posteroventral margin (Fig. 1D) ..... 2
- 1' Hind coxa bare on posteroventral margin ..... *Euryomma campineira* Carvalho & Pamplona
- 2 Scutum with vittae ..... 3
- 2' Scutum without vittae ..... *Euryomma longicorne* Stein
- 3 Scutum with five vittae along *acr*, *dc* and *ia* lines ... 4
- 3' Scutum with three vittae along *acr* and *dc* lines ..... 9
- 4 Wing faintly brownish, with apical third, between C vein and apical half of vein R<sub>2+3</sub>, faintly darkened (Fig. 1C) ..... 5
- 4' Wing hyaline ..... 7
- 5 Pv surface of mid femur with 3–4 rows of hooked setae forming a strong ctenidium ..... 6
- 5' Pv surface of mid femur with 2 rows of hooked setae ..... *Euryomma chillcotti* Grisales & Carvalho
- 6 Surstylus as long as epandrium and elongated and broad ... *Euryomma uwa* Grisales, Wolff & Carvalho
- 6' Surstylus shorter than epandrium and triangular ..... *Euryomma guane* Grisales, Wolff & Carvalho
- 7 Arista long pubescent, length of setulae more than 4 × the width of arista at base ..... *Euryomma panamensis* Chillcott
- 7' Arista short pubescent, length of setulae never longer than width of arista at base ..... 8
- 8 Frontal vitta (Fig. 1A) orange to yellow near lunula, broad; femora light brown ..... *Euryomma rufifrons* Stein
- 8' Frontal vitta grey to brown-orange near lunula, femora dark brown ..... *Euryomma nigrifemur* Stein
- 9 Lower orbital seta absent (Fig. 1A); postpedicel long, 3 × the length of pedicel; palpus flat and claviform (apex 2 × width of base) ..... *Euryomma palpingens* Wendt & Carvalho
- 9' Lower orbital seta present, postpedicel short, at most 2 × length of pedicel, palpus not flat and not strongly clavate (at most apex 1.5 × width of base) ..... 10
- 10 Femora dark brown ..... 11



**Figs. 2–4.** Distribution maps of *Euryomma* species. **2:** *E. aburrae*, *E. chillcotti*, *E. guanae*, *E. muisca*, *E. panamensis*, *E. rettenmeyeri*, and *E. uwa*. **3:** *E. americanum* Chillcott. **4:** *E. campineira* Carvalho & Pamplona, *E. carioca* Albuquerque, *E. chitarera* Grisales, Wolff & Carvalho, *E. longicorne* Stein, *E. nigrifemur* Stein, *E. palpingens* Wendt & Carvalho, and *E. rutifrons* Stein.

- 10' Femora yellow ..... 15
- 11 Arista long pubescent, length of setulae more than 4 × the width of arista at base ..... *Euryomma rettenmeyeri* Chillcott
- 11' Arista short pubescent ..... 12
- 12 Abdomen grey with faint golden yellow pollinosity ..... *Euryomma muisca* Grisales, Wolff & Carvalho
- 12' Abdomen dark in posterior and median area of each segment forming a “T” ..... 13
- 13 Three frontal setae (Fig. 1A); mid femur with apical 2 *ad* setae; *pv* surface of mid femur with two irregular rows of setae from basal third to apex, forming a ctenidium on apical half ... *Euryomma chitarera* Grisales, Wolff & Carvalho
- 13' Two frontal setae; anterodorsal surface of mid femur with a row of setae in basal half; *pv* surface of mid femur with two rows of setae, one longer and one shorter ..... 14
- 14 Cercal plate reaching first ¼ of surstyli with an anterior pointed prolongation ..... *Euryomma carioca* Albuquerque
- 14' Cercal plate not reaching first ¼ of surstyli, with weaker anterior pointed prolongation

- ..... *Euryomma aburrae* Grisales, Wolff & Carvalho
- 15 Basal half of postpedicel yellow; postpronotal lobe yellow; anterodorsal surface of mid tibia lacking medial seta (female *pv* row of F2 weak and uniserial, abdomen coloured as in male, except two basal segments distinctly yellowish) ..... *Euryomma americanum* Chillcott
- 15' Postpedicel entirely black; postpronotal lobe grey, anterodorsal surface of mid femur with medial seta ..... *Euryomma peregrinum* (Meigen)

4.3. Redescriptions

Full redescriptions are provided for all recognized species of the genus *Euryomma*, except for the seven recently described species from Colombia and Costa Rica by GRISALES et al. (2012a) and GRISALES et al. (2012b), for which only differential diagnoses are provided. Distribution of all species, except for *E. peregrinum*, are shown in Figs. 2–4.

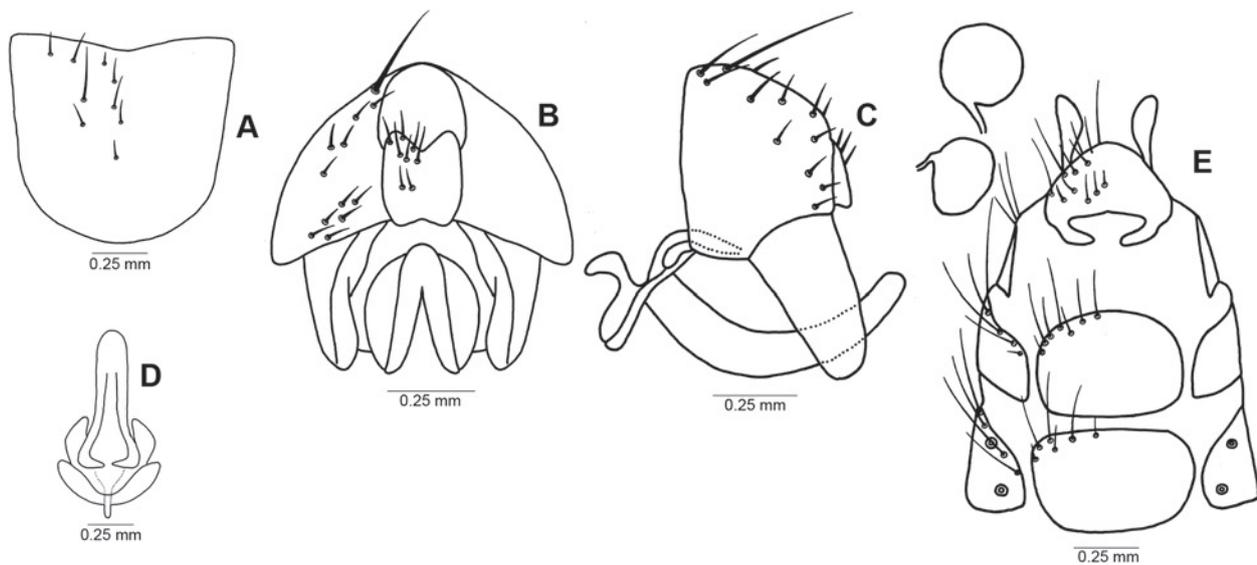


Fig. 5. *Euryomma americanum* Chillcott: A: sternite 5, B: eupandrium ventral, C: eupandrium lateral, D: hypandrium, E: oviscapt and spermathecae. Redrawn from CHILLCOTT (1961).

*Euryomma aburrae* Grisales, Wolff & Carvalho, 2012

*Euryomma aburrae* Grisales et al., 2012b: 808; GRISALES et al. 2016: 2.

Full description in GRISALES et al. (2012b).

**Differential diagnosis.** Frontal vitta brownish with anterior margin reddish, covered with golden yellow pollinosity, particularly on anterior region; length of postpedicel twice the length of pedicel; scutum with three brown vittae, median vitta more conspicuous, vittae following *dc* setae inconspicuous up to the posterior portion of scutum; male terminalia with cercal plate enlarged, concave and slightly pointed apically.

**Distribution.** Colombia: department of Antioquia (Fig. 2).

**Remarks.** This species was described based on a single specimen, and it is identical to *E. carioca* except for a slight difference in the shape of the cercal plate. In the cladistic analysis performed in this study, this difference is coded in character 59 where the cercal plate of *E. aburrae* was described as short (GRISALES et al. 2012b), and that of *E. carioca* as reaching first  $\frac{1}{4}$  of surstylus. This species is most probably a synonym of *E. carioca*, but only the examination of more specimens will confirm this decision.

*Euryomma americanum* Chillcott, 1961

Fig. 5A–E

*Euryomma americanum* Chillcott, 1961: 226–227.

**Differential diagnosis.** Scape and pedicel yellow; postpedicel yellow, apical half to third brownish. Postprono-

tal lobe and tip of scutellum yellow. *T1* lacking median *ad*. Sternite 5 formed by a single undivided plate.

**Redescription. Male:** Body length 2.6–3.7 mm. **Head:** Eye bare. Frontal vitta pale orange, whitish pruinose. Two long *fr*, 1.3  $\times$  longer than postpedicel, with 5–6 interstitials in single row. Two *orb*, and 1 row of setulae reaching first  $\frac{1}{4}$  of parafacial. Ocellar tubercle grey pollinose. One row of *pocl*. Fronto-orbital plate and facial ridge grey. Parafacial pale orange. Gena slender, depth below lowest eye-margin less than width of postpedicel. Facial carina yellow. Scape and pedicel yellow; postpedicel yellow, apical half to third brownish, 2  $\times$  as long as broad. Arista basally yellow, remainder brown, and short pubescent. Palpus yellow, slightly spatulate. **Thorax:** Greyish to yellowish brown pruinose, with three very faint brown vittae along bristle rows, and continuing onto anterior half of scutellum. Postpronotal lobe and tip of scutellum yellow. *Acr* biserial presuturally, triserial postsuturally. One pair of strong prescutellar *acr*. Postpronotal lobe with few short setae. One strong *pra* near suture and another weaker next to *spal*; prealar area bare. Proepimeron lacking setulae. **Legs:** Yellow except for black tarsi. *F1* 1 row of *pd* as long as femoral width, with 3 rows of very short *p*; 1 row of setulose *pv* except for 1 distinct preapical bristle. *T1* with 1 subapical *pd*, 1 apical *v* and 1 apical *pv*; lacking median *ad*. *F2* hardly narrowed at apex; with 1 row of short *av*, sparse near base but tighter in apical  $\frac{1}{3}$ ; with 1 row of short *pv*, but these less evenly developed than row of *av* and partially duplicated in apical  $\frac{1}{3}$ . *T2* hardly narrowed on basal half; ventral pubescence poorly developed and thin, 0.2  $\times$  width of *T2*, semi-decumbent and more conspicuous in apical  $\frac{1}{2}$  than at base of *T2*, with 1 long subapical *ad*; 1 submedian *a*; 3 apical *av* (central seta longer); 1 long apical *v*; 1 submedian (apical of the submedian *a*) and 1 apical *p*. *C3* with one weak seta on posteroventral

margin. *F3*: lacking preapical swelling ventral surface; with 1 row of very short *av* and 2 longer preapical *av*; *pv* setulose. *T3* with 2 short subequal *d*; 2 *ad* (one next to submedian *d* and other subapical); and 1 submedian *av*. **Wing**: Clear to yellowish, wing veins very lightly yellowish. Calypter small and white, lower one well-developed (oval in shape), projecting beyond upper one. Knob of halter dark yellow. **Abdomen**: Bluish brown pruinose, with only faint traces of yellow integumental colour, median vitta absent. Sternite 1 with very sparse setulae. Sternite 5 broad and with scattered setulae (Fig. 5A). **Postabdomen**: Epandrium (Fig. 5B–C) evenly setulose, setulae somewhat clustered at base of surstylus; cercal plate short and broad, not produced; surstylus distinctly fused to ninth tergum (epandrium), broad and not strongly tapering (Fig. 5B–C). Phallus narrow and tubular in shape, strongly curving dorsad (Fig. 5D).

**Female**: Body length 2.4 mm. Differs from male as follows: **Legs**: As in male, but *pv* row of *F2* weak and uniserial. **Abdomen**: Coloured as in male, except two basal segments distinctly yellowish. **Postabdomen**: Sternite 8 completely absent; sternites 6 and 7 short and broader than long; two spherical spermathecae (Fig. 5E).

**Distribution**. United States of America: California, Arizona (**new record**) (Fig. 3).

**Remarks**. The male holotype is in very good condition, although the specimen was directly pinned, and some damage has been done to the thorax.

**Material**. *Euryomma americanum*. Holotype ♂, ‘Santa Clara | Co. [unty] Cal. [fornia] Baker’, ‘Holotype | *Euryomma* | *americanum* | No. Chillcott’ (USNM). – USA, Calif.[ornia], Orange Co. [unty], Seal Bch. [Beach] weapons Sta. [tion], 33118bd, 5.v.[19]74, Paulo Moraes leg. (1♀, USNM); Yuma, Ariz.[ona], Gagné det. (1♀, USNM); Trap in citrus, 20.i.1964, J. Chapman leg., Steyskal [19]64 det. (1♂, USNM).

### *Euryomma campineira* Carvalho & Pamplona, 1979

*Euryomma campineira* Carvalho & Pamplona, 1979: 601; LINHARES 1981: 232–239; CARVALHO et al. 1993: 4; CARVALHO et al. 2002: 112.

**Differential diagnosis**. Eye weakly setulose. Scape and pedicel dark brown, tip of pedicel yellow; postpedicel dark brown to grey pruinose. Thorax grey-brown, with one brown vitta along *acr*, scutellum with two lateral vittae, posterior margin of hind coxa bare.

**Redescription**. **Female**: Body length 2.5–3.5 mm. **Head**: Eye with sparse and short setulae. Frontal vitta dark brown. Six *fr*, 2 of them 1.3 × longer than postpedicel, with 5–6 interstitials in single row. Two *orb*, and row of setulae reaching apex of pedicel. Ocellar tubercle grey pollinose. One row of *pocl*. Fronto-orbital plate, facial ridge, parafacial dark brown to grey pruinose. Gena 1/3 × width of postpedicel. Facial carina dark brown. Scape

and pedicel dark brown, tip of pedicel yellow; postpedicel dark brown to grey pruinose. Arista dark brown and short pubescent. Palpus dark brown, slightly spatulate. **Thorax**: Grey-brown, with 1 brown vitta along *acr*, scutellum with 2 lateral vittae. Postpronotal lobe and tip of scutellum grey brown. *Acr* triserial throughout and 1 pair of strong prescutellar *acr*. Postpronotal lobe with few short setae. One strong *pra* near suture and another weaker next to *spal*; prealar area bare. Proepimeron lacking setulae. **Legs**: Dark brown, yellowish at articulation of femur-tibia and tibial base. *F1* with 5 short and strong *ad* in apical 2/3, *av* row stronger towards apex. *T1* with 1 subapical *pd*, 1 apical *v* and 1 apical *pv*; 1 median *ad*. *F2* hardly narrowed at apex; with 1 row of short *av*, sparse near base but tighter in apical 1/3; with 1 row of short *pv*, but these less evenly developed than row of *av*. *T2* hardly narrowed on basal half; ventral pubescence poorly developed and thin, 0.2 × width of *T2*, with 1 long subapical *ad*; 1 submedian *a*; 3 apical *av* (central seta longer); 1 long apical *v*; 1 submedian (apical of the submedian *a*) and 1 apical *p*. *C3* bare on posteroventral margin. *F3* with 1 row of very short *av* and 2 longer preapical *av*; 1 median *ad*. *T3* with 2 short subequal *d*; 2 *ad* (1 next to submedian *d* and other subapical); and 1 submedian *av*. **Wing**: Clear to yellowish, wing veins very lightly yellowish. Calypter small and white, lower one well-developed (oval in shape), projecting beyond upper one. Knob of halter dark yellow. **Abdomen**: Greyish, with brown markings on I, II, and III segments. **Postabdomen**: Not examined.

**Distribution**. Brazil: São Paulo (Fig. 4).

**Remarks**. This species description was based on a female specimen, and it is supported by a strong diagnostic character: the absence of setae on the posterior margin of the hind coxa, which is autapomorphic within the genus.

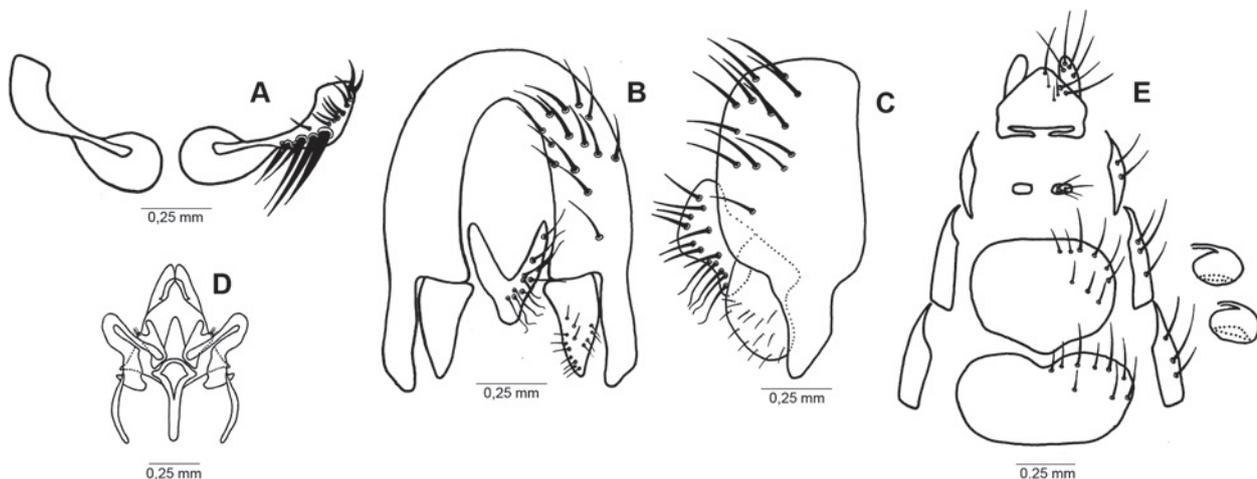
**Material**. *Euryomma campineira*. Holotype ♀, ‘Brasil, São Paulo, Campinas | Distrito Barão Geraldo | RFSM | 21/III/1978’ (MNRJ).

### *Euryomma carioca* Albuquerque, 1956 Fig. 6A–E

*Euryomma carioca* Albuquerque, 1956: 2; CARVALHO & PAMPLONA 1979: 603; LINHARES 1981: 232–239; ALMEIDA et al. 1985: 278; CARVALHO et al. 1993: 5; LOPES et al. 1997: 7; CARVALHO et al. 2002: 112; WENDT & CARVALHO 2007: 199; PATITUCCI et al. 2015: 106; GRISALES et al. 2016: 4.

*Euryomma tahami* Grisales et al., 2012b: 824, **syn.n.**; GRISALES et al. 2012a: 451; GRISALES et al. 2016: 4.

**Differential diagnosis**. Parafacial very slender, with a row of 3–4 very short setulae. Scape and pedicel yellow, postpedicel dark brown and covered with very thick silver grey pollinosity. Thorax with a strong vitta along *acr*, and two thinner ones along *dc*. Legs brown except for trochanter and tibia that are orange-yellow, tarsi black.



**Fig. 6.** *Euryomma carioca* Albuquerque: **A:** sternite 5, **B:** epandrium ventral, **C:** epandrium lateral, **D:** hypandrium, **E:** oviscapt and spermathecae. Redrawn and modified from WENDT & CARVALHO (2007).

**Redescription. Male:** Body length 2.8–3.2 mm. **Head:** Eye bare. Frontal vitta, fronto orbital plate, parafacialia, gena and face brownish grey. Two *fr* with setulae in between. *Pocl* in single, regular row. Parafacialia very slender, with row of 3–4 very short setulae. Scape and pedicel yellow, postpedicel dark brown and covered with very thick silver grey pollinosity. Arista light brown at base, dark brown towards apex, pubescent. Palpus dark brown claviform. **Thorax:** Grey with brown vitta along *acr*, and two weaker vittae along *dc*, all vittae continue on scutellum. *Acr* 2–3:3; *dc* 2:3; 3 *pprn*; 2 *pra*, anterior *pra* longer. **Wing:** Hyaline. Calypter yellowish white. Halter yellow to yellowish white. **Legs:** Coxa brown, trochanter and tibia orange-yellow; femur brown, light brown towards apex; tarsi black. *F1* with 1 row of long *pd*; 3 irregular rows of long and hair like *p*; 1 row of *pv*, long in apical  $\frac{1}{2}$ , short and setulose towards basal area except for 1 distinct preapical bristle. *T1* with 1 subapical *pd*, 1 apical *v* and 1 apical *pv*; 1 short median *ad*. *F2* hardly narrowed at apex; with 1 row of short *av*, sparse near base but tighter in apical  $\frac{1}{3}$ ; with 1 row of short *pv*, but these less evenly developed than row of *av* and partially duplicated in apical  $\frac{1}{3}$ . *T2* hardly narrowed on basal half; ventral pubescence poorly developed and thin,  $0.2 \times$  width of *T2*, semi-decumbent and more conspicuous in apical  $\frac{1}{2}$  than at base of *T2*; with 1 long subapical *ad*; 1 submedian *a*; 3 apical *av* (central seta longer); 1 long apical *v*; 1 submedian (apical of the submedian *a*) and 1 apical *p*. *C3* with 1 weak bristle-hair on posteroventral margin. *F3* lacking preapical swelling ventral surface; with 1 row of very short *av* and 2 longer preapical *av*; *pv* very short. *T3* with 2 short subequal *d*; 2 *ad* (one next to submedian *d* and other subapical); and 1 submedian *av*. **Abdomen:** Basal lateral half of each tergite grey, brown to dark brown in apical half. Sternite 1 bare. Sternite V reduced to two elongated plates bearing three to four strong and several weaker setae (Fig. 6A). **Postabdomen:** Epandrium  $1.5 \times$  as long as wide, with long lateral projections, longer than surstylus; surstylus triangular with strong short setae; cercal plate strongly concave, “U” shaped and with short

anterior projection (Fig. 6B,C). Phallus and hypandrium as in Fig. 6D.

**Female:** Body length 3.0–3.2 mm. Identical to male in external morphology. **Postabdomen:** Sternite 8 reduced to two small oval plates with four setae; sternite 7 as long as broad, slightly protruding in posterior margin; sternite 6 broader than long and with small concavity in anterior margin, both sternites with setae on posterior margin; two semicircular and smooth surfaced spermathecae (Fig. 6E).

**Distribution.** Brazil: Rio de Janeiro, Paraná, Santa Catarina, Rio Grande do Sul; Colombia: Antioquia; Costa Rica: Punta Arenas; Argentina: Buenos Aires (Fig. 4).

**Remarks.** Although we were not able to see the type material of *Euryomma tahami* Grisales, Wolff & Carvalho, 2012, comparison of its original description (GRISALES et al. 2012b: 824–826) with the type material of *Euryomma carioca* Albuquerque, 1956 leaves no doubt that *Euryomma tahami* is a **new synonym** of the former species. We consider that the differences in the genitalic structures and in the colouration [which is a weak diagnostic character within Fanniidae, where many species of *Fannia* (such as *Fannia heydenii* Wiedemann) and *Euryomma* (such as *E. peregrinum*) show intraspecific colour variations] considered by GRISALES et al. (2012b) are not sufficient to sustain *E. tahami* as a separate species.

**Material.** *Euryomma carioca*. Holotype ♂, ‘Rio de Janeiro | Grajau S. Lopes 4-6-39’ (MNRJ). – Paratypes (1♂, 1♀), ‘Rio de Janeiro | Grajau S. S lopes 4-6-39’ (MNRJ). – ARGENTINA, Ciudad Autónoma de Buenos Aires, Reserva Ecológica Costanera Sur,  $34^{\circ}36'53''S$   $58^{\circ}20'57''W$ , faeces, L. Patitucci leg. (14♂, 1♀, MACN); Ciudad Autónoma de Buenos Aires, Reserva Ecológica Costanera Sur, Argentina ( $34^{\circ}36'53''S$   $58^{\circ}20'57''W$ ), chicken viscera, L. Patitucci leg. (1♂, MACN); experimental field of the University of Buenos Aires, Ciudad Autónoma de Buenos Aires, Argentina ( $34^{\circ}32'47''S$   $58^{\circ}26'24''W$ ), faeces, L. Patitucci leg. (1♀, MACN); Instituto Dr. Carlos Malbrán, Ciudad Autónoma de Buenos Aires ( $34^{\circ}38'35''S$   $58^{\circ}23'28''W$ ), chicken viscera, Luciano Patitucci leg. (1♂, MACN).

*Euryomma chillcotti* Grisales & Carvalho, 2012*Euryomma chillcotti* Grisales et al., 2012a: 452–454.

Full description in GRISALES et al. (2012a).

**Differential diagnosis.** Head with 2 *fr*; scutum with five vittae along *acr* and *dc*, and *ia* area; antenna with arista short-pubescent (hairs shorter than width of base of arista), scape brown with apical margin yellowish, pedicel brown and yellowish around suture; *F2* with two rows of *pv*; hind tibia yellow with brownish ring on basal third; abdomen with sternite 5 with two sclerotized, curved, concave and elongated plates, plates with strong setae on apical area, and joined by another plate covered with strong spines.

**Distribution.** Costa Rica: Puntarenas, Cartago (Fig. 2).

**Remarks.** *Euryomma chillcotti* Grisales & Carvalho, 2012a and *Euryomma uwa* Grisales, Wolff & Carvalho, 2012a are very similar in their internal (although GRISALES et al. 2012a consider a series of differences related to size of the epandrium and cercal plate) and external morphology, except for the number of frontal setae (2 in *E. chillcotti* and 4 in *E. uwa*) and the number of rows of setae on the *pv* surface of the mid femur: where *E. chillcotti* bears 2 rows, while *E. uwa* presents a ctenidium formed by 3–4 rows of hooked setae.

*Euryomma chitarera* Grisales, Wolff & Carvalho, 2012*Euryomma chitarera* Grisales et al., 2012b: 814; GRISALES et al. 2016: 4.

Full description in GRISALES et al. (2012b).

**Differential diagnosis.** Frontal vitta dark brown with greyish pollinosity, anterior margin yellowish; length of postpedicel  $2.4 \times$  length of pedicel; scutum with three dark brown, inconspicuous vittae; wing yellowish; halter yellow. Male terminalia long, straight and narrow surstylus curved at apex, articulated with epandrium and almost the same length as epandrium; sternite 5 wide, with two long, hook-shaped apical projections bearing four strong spines.

**Distribution.** Colombia: department of Norte de Santander, department of Antioquia; Argentina: province of San Luis (**new record**) (Fig. 4).

**Material.** ARGENTINA, San Luis, El trapiche, 6.xii.2000, Domínguez & Roig leg.  $33^{\circ}06'51.1''S$   $66^{\circ}04'12.4''W$  (10♂, CEI); San Luis, 9 km N El trapiche, 6.vii.2000, Domínguez & Roig col.  $33^{\circ}02'40.8''S$   $66^{\circ}04'12.4''W$  (1♂, CEI); San Luis, Aguas Buenas, 8.xii.2000, Domínguez & Roig leg. Found on Fungi.  $32^{\circ}35'03.5''S$   $64^{\circ}57'20.5''W$ , 1133 m asl. (2♂, CEI).

*Euryomma guane* Grisales, Wolff & Carvalho, 2012*Euryomma guane* Grisales et al., 2012b: 819; GRISALES et al. 2016: 2.

Full description in GRISALES et al. (2012b).

**Differential diagnosis.** Frontal vitta dark brown with golden yellow pollinosity, particularly on anterior region; length of postpedicel  $3.5 \times$  the length of pedicel; pubescence of arista almost as long as width of base of arista; scutum with five brown vittae, vitta on intraalar region expanded over supra-alar area, median vitta expanded from base to apex of scutellum; wing light brown; calypter whitish with yellow margins; halter yellowish with base darkened; sternite 5 wide, with two elongate, well sclerotized, rod-shaped apical processes bearing strongly developed setae on inner lateral.

**Distribution.** Colombia: department of Santander (Fig. 2).

**Remarks.** *Euryomma guane* is identical in external morphology to *E. uwa*. Nevertheless, the male genitalia of *E. guane* differs from the latter species: the surstylus is much shorter and triangular.

*Euryomma longicorne* Stein, 1911

Figs. 1F–I, 7A–H

*Euryomma longicorne* Stein, 1911: 111; STEIN 1919: 133; SÉGUY 1937: 180; SÉGUY 1941: 55; ORTIZ 1946: 157; ALBUQUERQUE 1956: 5; PONT 1972: 2; CARVALHO & PAMPLONA 1979: 603; CARVALHO et al. 1993: 5; PONT 2001: 460; PONT 2013: 48.*Euryomma erythrogaster* Séguy, 1941: 54, **syn.n.**; ALBUQUERQUE 1956: 5; PONT 1972: 2; CARVALHO & PAMPLONA 1979: 603; CARVALHO et al. 1993: 5.

**Differential diagnosis.** Frontal vitta light grey to yellow near lunule and reddish anteriorly; postpedicel grey, very long and slender,  $4 \times$  as long as broad almost surpassing lower oral margin. Scutum lacking vittae, yellow at tip. Legs yellow except for tarsi. Sternite 5 with strong and hooked setae.

**Redescription. Male:** Body length 3.15 mm. **Head:** Frontal vitta light grey to yellow near lunule. Frons silvery grey pruinose. Two long *fr*, with 3–5 shorter interstitials. One row of short orbital setulae reaching parafacial. Eye bare. One row of *pocl*. Facial ridge and parafacial grey, parafacial at base of postpedicel  $1 \times$  width of same and bearing 4–5 short setulae. Gena slender, depth below lowest eye-margin less than width of postpedicel. Facial carina yellow. Scape and pedicel light brown; postpedicel grey, long and slender,  $4 \times$  as long as broad and covered with short pubescence. Arista dark-brown and short pubescent. Palpus brown, slender and spatulate. **Thorax:** Wholly grey dusted. Scutellum yellow at tip. Presutural *acr* biserial, postsuturally triserial. One pair of strong prescutellar *acr s*. Postpronotal



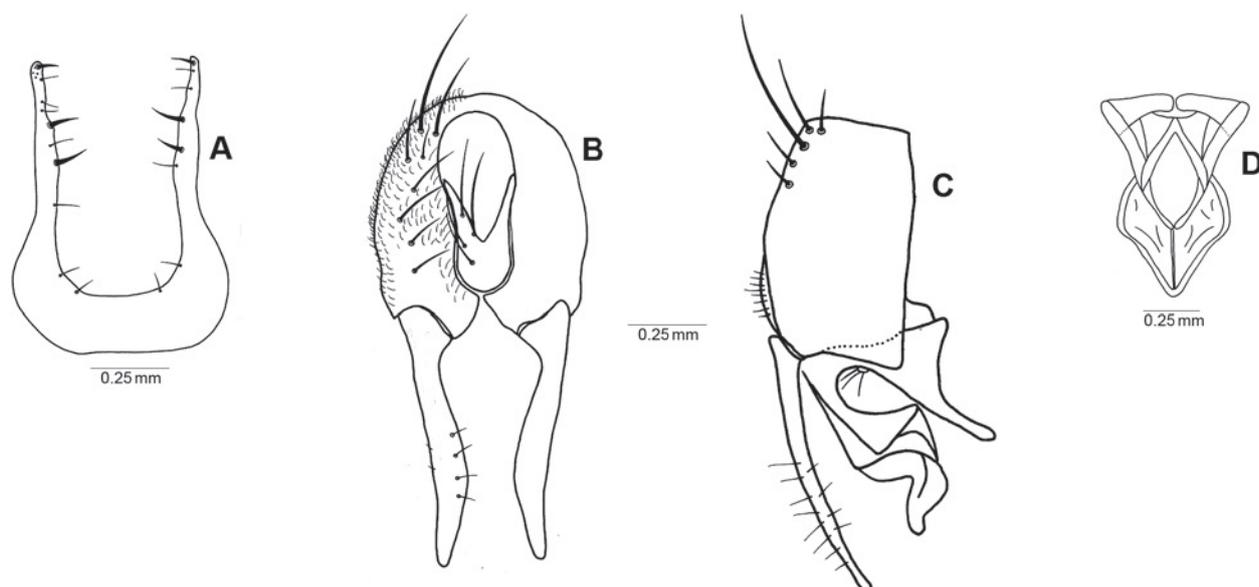
**Fig. 7.** *Euryomma erythrogaster* Séguy, male holotype: **A:** head, thorax and wing, **B:** label 1, **C:** label 2, **D:** abdomen, **E:** mid leg anterior view, **F:** label 3, **G:** label 4, **H:** sternite 5.

lobe with 2 setae and 8 setulae. One strong *pra* near suture and another weaker next to *spal*; prealar area bare. Proepimeron lacking setulae surrounding *prepm*. **Legs:** Yellow except for brown tarsi. *F1* with 1 row of long *pd*; 1 row of strong *p*, and another row of short setulae; 1 row of *pv* very short in basal ½, much longer in apical ½. *T1* with 1 subapical *pd*, 1 apical *v* and 1 apical *pv*; with 1 submedian and 1 apical *ad*. *F2* hardly narrowed at apex; with 1 row of *ad*; 1 row of *a*; 1 row of *av*, sparse near base but tighter in apical ½; 1 row of short *pv*, but these less evenly developed than row of *av* and partially duplicated in apical ½. *T2* hardly narrowed on basal half; ventral pubescence poorly developed and thin, 0.3 × width of *T2*, semi-decumbent and more conspicuous in apical ½ than at base of *T2*; with 1 long subapical *ad*; 1 submedian *a*; 3 apical *av*; 1 long apical *v*; 1 submedian (apical of the submedian *a*) and 1 apical *p*. *C3* with 1 seta on postero-apical margin. *F3* with 4 *d* at apex; 1 row of very short *av* except for 2 longer preapical *av*; *pv* surface bare. *T3* with 2 short subequal to *d*; 2 *ad* (one in same position as submedian *d*, second below subapical *d*); 1 submedian *av*; 1 apical *v*. **Wing:** Clear to yellowish, wing veins very lightly yellowish. Calypter small and white, lower one well-developed (oval in shape), projecting beyond upper one. Knob of halter dark yellow. **Abdomen:** Ground colour grey-black. Sternite 1 setulose. Sternite 5 divided, with very strong hooked setae posteriorly, followed by strong straight setae (Fig. 1F). **Postabdomen:** Epandrium longer than broad, covered with short setulae, surstylus triangular and short, ¼ of length of epandrium (Fig. 1G,H); hypandrium and associated structures as in Fig. 1(I).

**Female:** Body length 3.25 mm. No morphological differences from male, and, as pointed out by STEIN (1911), easily recognized by large antenna. Oviscapt not dissected.

**Distribution.** Chile: IV region of Coquimbo, III region of Atacama (**new record**) (Fig. 4).

**Remarks.** SÉGUY (1941) apparently described this species based on a single specimen, the male holotype (Fig. 7A–H). This specimen was collected by Claudio Gay, a French naturalist who accepted a position as a researcher for the Chilean government to carry out a scientific survey of the country. He donated all of his collected material from Chile to the MNHN (Paris). There were four collections containing Muscoidea that Gay gave to the Paris Museum: 1836 (accession number 35.36, from Chile), 1837 (670.37, from Chile), 1843 (15.43, from Chile) and 1849 (59.49, from Cuzco, Peru) (A.C. Pont pers. comm.). The last of these entries from 1843 in Chile (15.43) coincides with one of the labels (Fig. 5F) of the holotype of *E. erythrogaster* (SÉGUY 1941). The holotype is in very poor condition: the head and thorax are glued to a paper rectangle (Fig. 12A), the abdomen and hind leg have also been glued to plastic rectangles (Fig. 7D,E). Unfortunately, the mid leg that according to Séguy's description bears 2 rows of short and stout setae, a character used in the key to separate this species from the remaining *Euryomma* known at the time, is missing. The holotype also includes three slides, one of which contains sternite 5 (Fig. 7G), and the other two are empty of their content, possibly lost because of damage due to clearing with K(OH). In spite of the poor condition of the holotype of *Euryomma erythrogaster*, after illustrating the structures of the male postabdomen of *E. longicornis* we consider that *Euryomma erythrogaster* Séguy, 1941 is a **new synonym** of *Euryomma longicornis* Stein, 1911 based on the similarity of sternite 5, as well as the similarity in the description of the external morphology of both species.



**Fig. 8.** *Euryomma nigrifemur* Stein: **A:** sternite 5, **B:** epiandrium ventral, **C:** epiandrium lateral, **D:** hypandrium.

**Material.** *Euryomma longicorne*. Paralectotype ♀, ‘Chile | 22-IX-02 | Guayacan’, ‘Coll. W. Schnuse | 1911-3’, ‘Paralectotype ♀ | *Euryomma* | *longicorne* | Stein, 1911 | Des. A. C. Pont 1999’ (SMTD). – Lectotype ♂, ‘Chile | 22-IX-02 | el’, Coll. W. Schnuse | 1911-3’, ‘*Euryomma* | *longicorne* | ♂ sp. n’, ‘Lectotype | *Euryomma* | *longicorne* | Stein, 1911 | Des. A.C. Pont (SMTD). – CHILE, Atacama, 21.x.1954, L.E. Peña leg. (2♂, 3♀, CNC).

*Euryomma erythrogaster*. Holotype ♂ ‘*Euryomma* | *erythrogaster* | TYP. ♂ / E. Séguy vid.’, ‘TYPE’, ‘Museum Paris | Chili | Gay 15-43’, ‘*Euryomma* | *erythrogaster* | Type | E. Séguy vid’ (MNHN).

VALHO & PAMPLONA 1979: 603; CARVALHO et al. 1993: 5; PONT 2013: 49, 124.

*Euryomma cornuatum* Grisales, Wolff & Carvalho, 2012b: 816, **syn.n.**; GRISALES et al. 2016: 2.

*Euryomma muisca* Grisales, Wolff & de Carvalho, 2012

*Euryomma muisca* Grisales et al., 2012b: 821; GRISALES et al. 2016: 2.

Full description in GRISALES et al. (2012b).

**Differential diagnosis.** Frontal vitta dark brown; scape and pedicel yellow; length of postpedicel 1.5 × the length of pedicel; arista with short pubescence, rays shorter than width of base of arista; scutum with three brown vittae, *dc* vitta not well-delimited due to pollinosity on scutum; sternite 5 with two long apical processes, with long setae and strong spines on inner apical region; cercal plate formed by cerci fused on apical half (V-shaped), apex square.

**Distribution.** Colombia: department of Cundinamarca (Fig. 2).

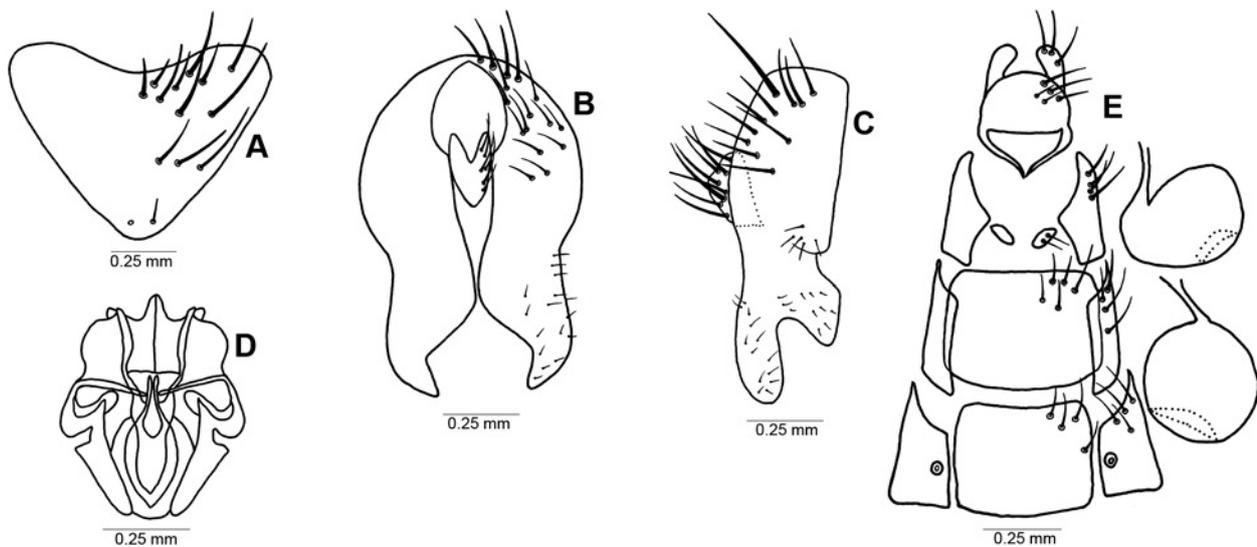
*Euryomma nigrifemur* Stein, 1911

Fig. 8A–D

*Euryomma nigrifemur* Stein, 1911: 110; STEIN 1919: 133; SÉGUY 1937: 180; SÉGUY 1941: 55; ORTIZ 1946: 157; ALBUQUERQUE 1956: 603; GARCIA 1964: no pagination; PONT 1972: 2; CAR-

**Differential diagnosis.** Antenna and palpus dark brown. Thorax light grey dusted with thin brown vittae along *acr*, *dc*, and *ia* lines. Femora and tarsi dark brown, tibiae yellow. Sternite 5 “U” shaped, epiandrium with very long and protruding surstylus.

**Redescription. Male:** Body length 3.1–3.3 mm. **Head:** Frontal vitta grey to brown-orange near lunule, frons grey pruinose. Two long *fr*, 1.5 × longer than postpedicel, with 3 shorter interstitials. One row of short orbital setulae reaching parafacial. Eye bare. One row of *pocl*. Facial ridge and parafacial grey, parafacial at base of flagellomere 0.9 × width of same and bearing 4–5 short setulae. Gena slender, depth below lowest eye-margin less than width of postpedicel. Facial carina grey. Scape and pedicel light brown; postpedicel grey, 2 × as long as broad and covered with short pubescence. Arista dark-brown and short pubescent. Palpus dark brown, straight (same width throughout). **Thorax:** Light grey dusted with thin brown vittae along *acr*, *dc*, and *ia* lines. Scutellum grey at tip. Presutural *acr* biserial, postsuturally triserial. One pair of strong prescutellar *acr s*. Postpronotal lobe with 2 setae and 8 setulae. Two *pra* of equal length, 1 near suture and other next to *spal*; prealar area bare. Proepimeron lacking setulae surrounding *prepm*. **Legs:** Femur and tarsi dark brown, tibia yellow. *F1* with 1 row of long *pd*; 1 row of strong *p*, and another row of short setulae; 1 row of *pv* very short in basal ½, much longer in apical ½. *T1* with 1 subapical *pd*, 1 apical *v* and 1 apical *pv*; with 1 submedian and 1 apical *ad*. *F2* hardly narrowed at apex; with 1 row of very short *ad*, almost undistinguishable from ground setulae; 1 row of *av*, sparse



**Fig. 9.** *Euryomma palpingens* Wendt & Carvalho: **A:** sternite 5, **B:** epandrium ventral, **C:** epandrium lateral, **D:** hypandrium, **E:** oviscapt and spermathecae. Redrawn and modified from WENDT & CARVALHO (2007).

near base but tighter in apical  $\frac{1}{3}$ ; 1 row of short *pv*, less evenly developed than row of *av* and partially duplicated in apical  $\frac{1}{3}$ . *T2* hardly narrowed on basal half; ventral pubescence poorly developed and thin,  $0.6 \times$  width of *T2*, semi-decumbent and more conspicuous in apical  $\frac{1}{2}$  than at base of *T2*; with 1 long subapical *ad*; 1 submedian *a*; 3 apical *av*; 1 long apical *v*; 1 submedian (apicad of submedian *a*) and 1 apical *p*. *C3* with 1 seta on postero-apical margin. *F3*: with 4 *d* at apex; 1 row of very short *av* except for 2 longer preapical *av*; posteroventral surface bare. *T3* with 2 short subequal *d*; 1 *ad* (slightly basad of submedian *d*); 1 submedian *av*; 1 apical *v*. **Wing:** Clear to yellowish, wing veins very lightly yellowish. Calypter small and white, lower one well-developed (oval in shape), projecting beyond upper one. Knob of halter dark yellow. **Abdomen:** Ground colour grey, with barely visible central brown vitta. Sternite 1 setulose. Sternite 5 strongly “U” shaped with two very long lateral extensions bearing long setae along internal margins (Fig. 8A). **Postabdomen:** Epandrium slightly longer than wide, covered with setulae and bearing long setae; surstylus very long, longer than epandrium, narrow, with 4 to 5 setae; cercal plate fused on apical half (V-shaped), square apex (Fig. 8B,C). Hypandrium and associated structures in Fig. 8D).

**Female:** Body length 3–3.5 mm. Differs from male as follows: as mentioned by STEIN (1911) female identical to male, except for broader and somewhat flattened legs. Oviscapt not dissected.

**Distribution.** Peru: department of Arequipa; Chile: XV region of Arica and Parinacota; Colombia: Antioquia; Nicaragua: Matagalpa (**new record**) (Fig. 4).

**Remarks.** Although we were not able to examine the type material of *Euryomma cornuatum* Grisales, Wolff & Carvalho, 2012, comparison of its original description (GRISALES et al. 2012a: 816–819) with the type material

of *Euryomma nigrifemur* Stein, 1911 leaves no doubt that *Euryomma cornuatum* is a **new synonym** of the former species.

**Material.** *Euryomma nigrifemur*. Paralectotype ♀, ‘Peru | 14-XI-02 | Arequipa’, ‘Coll. W. Schnuse | 1911-3’, ‘Paralectotype ♀ | *Euryomma* | nigrifemur | Stein, 1911 | Des. A.C. Pont 1999’ (SMTD). – Paralectotype ♀, ‘Peru | 13-XI-02 | Arequipa’, ‘Coll. W. Schnuse | 1911-3’, ‘*Euryomma* | nigrifemur | sp. n.’, ‘Paralectotype ♀ | *Euryomma* | nigrifemur | Stein, 1911 | Des. A.C. Pont 1999’ (SMTD). – Paralectotype ♂, ‘Chile | 22-X-02 | Tacna’, ‘Coll. W. Schnuse | 1911-3’, ‘Paralectotype ♂ | *Euryomma* | nigrifemur | Stein, 1911 | Des. A. C. Pont 1999’ (SMTD). – Paralectotype ♂, ‘Chile | 16-X-02 | Palca’, ‘Coll. W. Schnuse | 1911-3’, ‘Paralectotype ♂ | *Euryomma* | nigrifemur | Stein, 1911 | Des. A.C. Pont 1999’ (SMTD). – NICARAGUA, Matagalpa, Fuente Pura, 20.iii.1994, J.M. Maes & A. De la Fuente legs. Maes det. (18♂, MEL).

*Euryomma palpingens* Wendt & Carvalho, 2007  
Fig. 9A–E

*Euryomma palpingens* Wendt & Carvalho, 2007: 201; GRISALES et al. 2012a: 456.

*Euryomma steini* Grisales & Carvalho, 2012a: 455, **syn.n.**

**Differential diagnosis.** Head of male with only one *orb*. Scape brown with anterior margin slightly reddish, pedicel brown, slightly reddish around suture; arista brown, bearing long hairs, basal third brownish; palpus dark brown, flat and claviform,  $4 \times$  the width of base of palpus. Abdomen with syntergite 1+2 and tergite 3 yellow translucent, sternite 5 of male formed by a single plate with strong setae on apical half.

**Description. Male:** Body length 2.5 mm. **Head:** Eyes bare; frontal vitta brownish, anterior margin reddish. Two *fr*, with intercalated weak setae; lower *orb* absent. *Poc* parallel. Fronto-orbital plate, parafacial and gena with silver pollinosity. Parafacial with short setae on

dorsal half. Scape brown with anterior margin slightly reddish, pedicel brown, slightly reddish around suture. Postpedicel dark brown with golden yellow pollinosity,  $3 \times$  length of pedicel. Arista brown with basal third brownish, bearing setae as long as arista width. Palpus dark brown, flat and claviform. **Thorax:** Brownish with golden yellow pollinosity, scutum with three brown vittae along *acr* and *dc*. *Acr* 3:3–2, in regular rows; *dc* 2:3; *pprn* with 2 strong setae, and third weaker, postpronotal area with setulae; 2 *pra*; 1 strong and 1 weak *prepm*, proepimeral area without setulae; *kepst* 1:1, with 1 weakly developed seta between them, katepisternal area with short setulae. **Wing:** Yellowish. Calypters yellowish. Halter yellow. **Legs:** Brownish with tarsi dark brown; pulvilli yellowish. *F1* with 1 row of short *av*; 1 series of long and strong *d*; 1 row of *pd*; posterior surface setulose, with thin setae; 1 series of long *pv* on apical half. *T1* with 1 pre-apical *d*; 1 apical *pv* and 1 longer (than *pv*) apical *v*. Basal tarsomere of fore leg with strong basal *v*. *F2* with 1 row of short *av*, setae closer-set and hooked at apex on apical half; 1 row of *ad* on basal half, preapex with 2 short setae; 3 pre-apical strong *p*; 1 row of *pv* and *v*, both short, hooked; row of *v* near to *pv*. *T2* ventrally setulose, with two preapical *v*, 1 short and 1 long; 1 apical seta and 1 submedian *a*; 1 apical *av*; 1 short apical *pv*. *C3* with 1 setula on posterior margin. *F3* with 2 *ad* on apical half; 2 strong preapical *av*; 2 preapical *d*. *Pv* and *p* surface without differentiated seta. *T3* with 1 submedian seta and 1 preapical *d*; 1 median, 1 preapical seta and 1 apical *a*; 1 median and 1 strong apical *av*; 1 strong apical *pv*; 1 submedian *pd*. Hind first tarsomere strongly setulose on ventral surface. **Abdomen:** Light grey with sintergite 1+2 and tergite 3 yellow translucent. Sternite 1 bare. Sternite 5 (Fig. 9A): formed by single triangular plate with strong setae distributed on all its surface. **Postabdomen:** Epanthrium rounded, surstylus very long, curved and tapered towards apex (Fig. 9B,C). Hypandrium and associated structures as in Fig. 9D.

**Female:** Body length: 2.4 mm. Differs from male as follows: **Head:** Both *orb*, upper and lower present. **Legs:** lacking ventral pubescence of mid tibia. **Postabdomen:** sternite 8 formed by small circular plates bearing 3 setae; sternites 6 and 7 rectangular, broader than long; two spherical spermathecae (Fig. 9E).

**Distribution.** Brazil: state of Paraná; Costa Rica: Province of Limón (Fig. 4).

**Remarks.** The description of *E. steini* was based on a single specimen, therefore we consider that the differences found by GRISALES et al. (2012a) in the size of the palpi, and of the size (and not the shape) of different structures of the male genitalia are due to intraspecific variations. Although we were not able to examine the type material of *Euryomma steini* Grisales & Carvalho comparison of its original description (GRISALES et al. 2012a: 824–826) with the type material of *Euryomma palpingens* Wendt & Carvalho, 2007 leaves no doubt that *Euryomma steini* is a **new synonym** of the former species.

**Material.** *Euryomma palpingens*. Holotype ♂, ‘Brasil Ponta Grossa (V. Velha) PR | Reserva IAPAR br 376 | BRASIL 03.X.1986 | Lev. Ent. PROFAUPAR | MALAISE’ (DZUP). – Paratypes: ‘Antonina-PR | Reserva Sapitanduva | BRASIL 08.IX.1986 | Lev. Ent. PROFAUPAR | MALAISE’ (1♀, DZUP). ‘Antonina-PR | Reserva Sapitanduva | BRASIL 15.IX.1986 | Lev. Ent. PROFAUPAR | MALAISE’ (2♀, DZUP). ‘Antonina-PR | Reserva Sapitanduva | BRASIL 07.IX.1987 | Lev. Ent. PROFAUPAR | MALAISE’ (1♂, DZUP). ‘Antonina-PR | Reserva Sapitanduva | BRASIL 05.X.1987 | Lev. Ent. PROFAUPAR | MALAISE’ (1♀, DZUP). ‘Ponta Grossa (V. Velha) | Reserva IAPAR Br 376 | BRASIL 04.VIII.1986 | Lev. Ent. PROFAUPAR | MALAISE’ (1♀, DZUP). ‘Ponta Grossa (V. Velha) | Reserva IAPAR Br 376 | BRASIL 29.XIII.1986 | Lev. Ent. PROFAUPAR | MALAISE’ (1♂, DZUP), ‘Ponta Grossa (V. Velha) | Reserva IAPAR Br 376 | BRASIL 12.I.1987 | Lev. Ent. PROFAUPAR | MALAISE’ (1♀, DZUP). ‘Ponta Grossa (V. Velha) | Reserva IAPAR Br 376 | BRASIL 11.V.1987 | Lev. Ent. PROFAUPAR | MALAISE’ (2♀, DZUP).

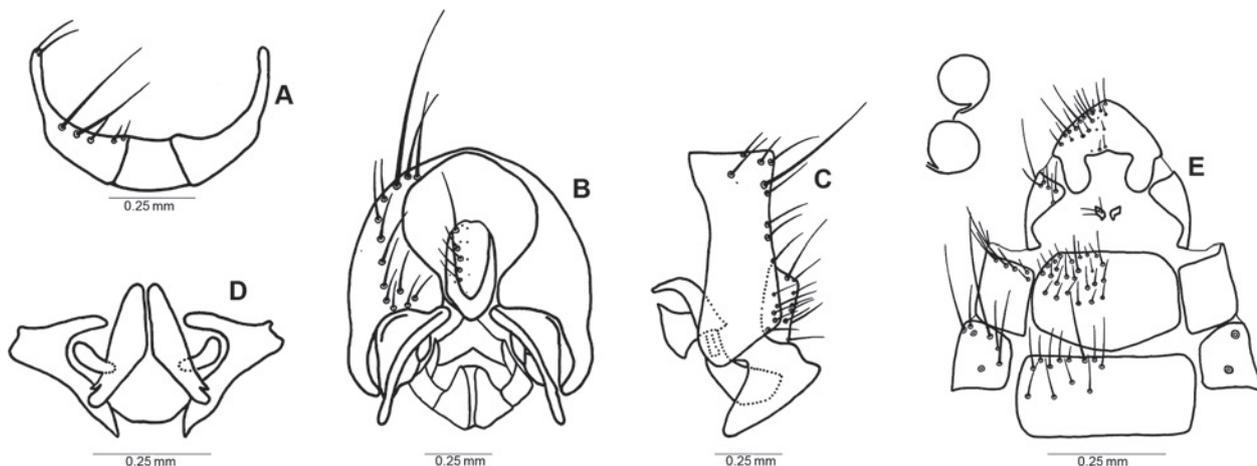
### *Euryomma panamensis* Chillcott, 1958

Fig. 10A–E

*Euryomma panamensis* Chillcott, 1958: 730, figs. 4–6, 8, 17–20; GRISALES et al. 2012a: 454.

**Differential diagnosis.** Basal antennal segments yellowish and white, arista long pubescent and palpus dark grey; abdomen with sternite 5 completely divided in medial area, each half produced into a slender process in outer margin, this process bears two apical and a pre-apical seta, posterior margin with 2–3 setae and several setulae, anterior margin membranous with few short setulae.

**Redescription. Male:** Body length 3 mm. **Head:** Eye bare. Frontal vitta brownish, reddish on anterior margin. Interocular space 0.4 mm. Two pairs of *fr*, with two intercalated setulae. Two pairs of *orb*, both reclinate. Ocellar triangle silvery pollinose; with one pair of proclinate and strong *oc*, posterior area of ocellar triangle with few setulae. *Poc* divergent. Fronto-orbital plate, parafacial and gena grey pollinose. Parafacial with four short setulae on dorsal fourth. Scape brown with yellow anterior margin; pedicel brown at base, yellowish at apex and around suture; postpedicel  $3 \times$  length of pedicel, dark brown with heavy grey pollinosity; arista light brown, bearing long pubescence, hairs  $1.5 \times$  width of base of arista. Palpus dark brown, straight, apex as wide as base. **Thorax:** Grey brown pollinose, scutum with 5 brown vittae along *acr*, *dc*, and *ia*, median vitta narrow, extending to base of scutellum; *dc* vitta thin and interrupted, extending to apex of scutellum, and *ia* vitta diffuse and broader than former. *Acr* 3:3 in irregular rows. *Pprn* with 2 strong and 1 weaker seta, postpronotal area with few setulae. Two *pra*, anterior one longer, near suture, and 1 weaker above first *spal*. Two *prepm*, that closest to spiracle longer; proepimeral area bare. *Kepst* with no distinct medial setulae, katepisternum with short setulae. **Legs:** dark brown, except for femoral apex and tibial bases. Pulvilli white. *F1* with 1 row of five *pd*; dorsal surface covered with setulae; 1 row of *pv* formed by weak and short setulae basally and 3 strong setae at apex. *T1* with 1



**Fig. 10.** *Euryomma panamensis* Chillcott: **A:** sternite 5, **B:** epiandrium lateral, **C:** epiandrium ventral, **D:** hypandrium, **E:** oviscap and spermathecae. Redrawn from CHILLCOTT (1958).

strong pre-apical *d*; 1 very weak submedian *ad*; 1 apical *v*; 1 apical *pv*. Basal fore tarsomere with short and strong setae on ventral surface. *F2* with 1 row of *av*, less than half as long as femoral diameter, weak, becoming shorter and closer-set apically to form weak comb; 1 row of *pv*, stronger at apex, weakly duplicated ventrally on media third; 1 row of *ad*, short, longer and directed to anterior surface; 4 pre-apical *p*. *T2* only weakly thicker apically; ventral pubescence short and multiserial; 1 apical *pv*; 1 long and strong apical *v*; 1 apical *av*; 1 submedian and 1 strong and long apical *a*; 1 long and strong apical *ad*; 1 submedian and 1 apical *p*. *C3* with 1 setula on posterior margin. *F3* with 1 row of long *ad*, directed to dorsal surface at apex; 1 row of *av*, setulose except for 2 setae at apex; posteroventral surface setulose. *T3* with 1 submedian and 1 apical *av*; 1 submedian and 1 preapical *ad*; 2 long *d*. Ventral surface on hind tarsomere I strongly setulose. **Wing:** Clear, calypter and halter pale yellow. **Abdomen:** Dark brownish and grey pollinose, laterally with pale grey anterior margins, grey pollinose expanded laterally to cover anterior half margin of each segment. Hypopygium weakly projecting. Sternite 1 bare. Sternite 5 (Fig. 10A) completely divided in medial area, each half produced into a slender process in outer margin, this process bears 2 apical and a pre-apical seta; posterior margin with 2–3 setae and several setulae; anterior margin membranous with few short setulae. **Postabdomen:** Epiandrium as long as broad, bell-shaped, with one strong and several weaker setae; surstylus partially fused to epiandrium, narrow at base then rapidly broadening to form a triangle; cercal plate short and broad (Fig. 10B,C). Hypandrium slender, interrupted medially, with a long basal flange directed inwardly (Fig. 10D).

**Female:** Body length 3 mm. Differs from male as follows: **Abdomen:** Markings darker, grey evident only at lateral margins and on terminal segment. **Legs:** *av* and *pv* rows of *F2* setulose apically, basally with 5 or 6 short but distinct setae on each surface, *T3* with a strong *av* seta, dorsal setae shorter. **Postabdomen:** Sternite 8 reduced to two small plates bearing 3 setae; sternite 7 somewhat

pointed in anterior margin. Sternite 6 rectangular, broader than long; with two spherical spermathecae (Fig. 10E).

**Distribution.** Panama: La Chorrera (Fig. 2).

**Material.** *Euryomma panamensis*. Paratype ♂, ‘Barro Colorado I [sland] | Canal Zone, Panama | 28–III–1956 No.580 | C.W. & M.E. Rettenmeyer’, ‘Eciton burchelli| refuse deposit | Nomadic Day’, ‘PARATYPE | *Euryomma* M [ale] | panamensis | No. Chillcott (CNC)’.

### *Euryomma peregrinum* (Meigen, 1826)

Fig. 11A–E

*Anthomyia peregrinum* Meigen, 1826: 187.

*Euryomma peregrinum* BEZZI & STEIN 1907: 666; BECKER 1908a: 99; BECKER 1908b: 195; STEIN 1908: 13; STEIN 1910: 73; SCHNABL & DZIEDZICKI 1911: 129; STEIN 1911: 111; STEIN 1914: 24; STEIN 1915: 28; STEIN 1918: 154; STEIN 1919: 133; STEIN 1920: 46; SÉGUY 1923: 256; MALLOCH 1924: 146; MALLOCH 1925: 38; BRYAN 1934: 426; FREY 1937: 135; SÉGUY 1937: 180; SÉGUY 1941: 55; ORTIZ 1946: 157; HARRISON 1953: 10; HENNIG 1955a: 26; HENNIG 1955b: 14; LEE et al. 1956: 329; HENNIG 1957: 411; ARNAUD 1959: 184; SÉGUY 1960: 149; CHILLCOTT 1961: 224; ARNAUD 1963: 118; PONT 1972: 2; CAMPOS & PEÑA 1973: 227; PONT 1973: 182; FERRAR et al. 1975: 10; CARVALHO & PAMPLONA 1979: 603; HOLLOWAY 1985: 249; ALMEIDA et al. 1985: 112; CARVALHO et al. 1993: 5; CARVALHO et al. 2002: 112; CARVALHO et al. 2003: 6; WENDT & CARVALHO 2007: 203; DOMÍNGUEZ & ROIG-JUÑENT 2008: 574; MACFARLANE et al. 2010: 449; DOMÍNGUEZ & ROIG-JUÑENT 2011: 66, 81; ABALLAY et al. 2012: 283; PONT 2013: 48, 124; DOMÍNGUEZ & PONT 2014: 16; GRISALES et al. 2016: 2.

*Anthomyia communis* Walker, 1856: 366; syn. teste STEIN 1901: 193; HUCKETT 1934: 136.

*Euryomma communis* Stein, 1901: 193; ALDRICH 1905: 540.

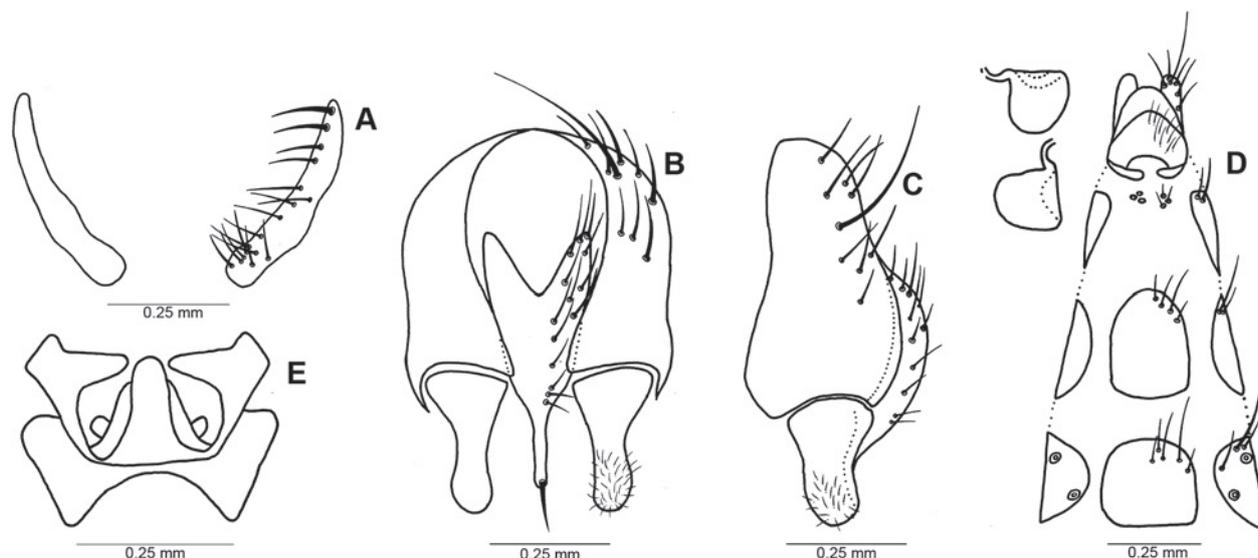
*Homalomyia schembrii* Rondani, 1866: 127; RONDANI 1877: 60; syn. teste BEZZI & STEIN 1907: 666.

*Coenosia pseudomollicula* Frauenfeld, 1867: 450; syn. teste STEIN 1919: 133.

*Anthomyia brevivalpis* Thomson, 1868: 557; syn. teste STEIN 1910: 73.

*Homalomyia observanda* Rondani, 1877: 61; syn. teste HENNIG 1964: 1068

*Euryomma hispaniense* Stein, 1899: 20; JACOBS et al. 1906: 71; ENDERLEIN 1912: 101; SÉGUY 1937: 180; ORTIZ 1946: 157.



**Fig. 11.** *Euryomma peregrinum* (Meigen): **A:** sternite 5, **B:** epandrium lateral, **C:** epandrium ventral, **D:** hypandrium, **E:** oviscapt and spermathecae. Redrawn from PONT (1977), except for hypandrium, which was redrawn from CHILLCOTT (1961).

*Hoplogaster dubia* Grimshaw, 1901: 42; syn. teste STEIN 1919: 133.  
*Cerodiscia zelleri* Enderlein, 1936: XVI, 201; syn. teste HENNIG 1964: 1068.

*Euryomma peregrinum* var. *obscurigastri* Santos Abreu, 1976: 53, unavailable.

**Differential diagnosis.** Parafacial yellow, scape and pedicel yellow, postpedicel dark grey,  $1.9 \times$  as long as broad. Thorax ground colour black, wholly grey to yellowish grey dusted, in posterior view, scutum with faint traces of 3 brownish vittae along *dc* and *acr* rows, these more conspicuous anteriorly than posteriorly. Legs yellow except for black tarsi.

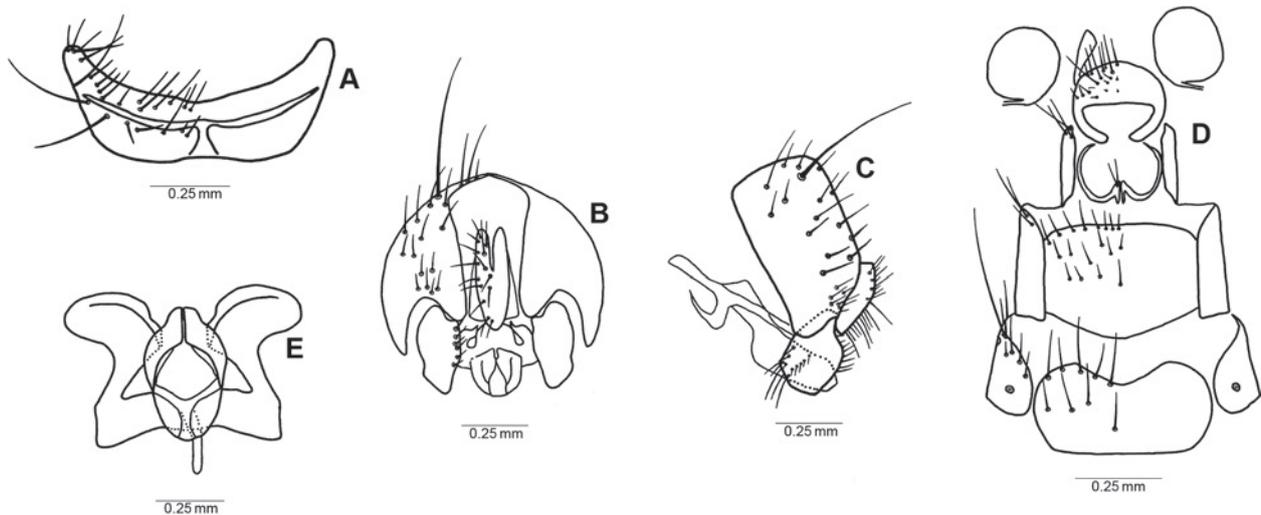
**Redescription. Male:** Body length 3.8–4.1 mm. **Head:** Frontal vitta light grey to yellow near lunula, at narrowest point  $2.8 \times$  width of the anterior ocellus. Fron silvery grey pruinose. Two long *fr*,  $1.2 \times$  longer than flagellomere, with several interstitials. Eye bare. One row of *pocl*. Facialia grey. Parafacialia yellow, and bare. Gena slender, the depth below lowest eye-margin less than width of flagellomere. Facial carina yellow. Scape and pedicel yellow; flagellomere dark grey,  $1.9 \times$  as long as broad. Arista dark-brown and short pubescent. Palpus yellow, slightly spatulate. Inferior oral margin straight to slightly convex. **Thorax:** Ground colour black; wholly grey to yellowish grey dusted. In posterior view, scutum with faint traces of 3 brownish vittae along *dc* and *acr* rows, these more conspicuous interiorly than posteriorly. Scutellum yellow at tip. *Acr* triserial throughout. One pair of strong prescutellar *acr s*. One strong presutural *dc*, the anterior one hardly distinct from the ground-setulae. Postpronotal lobe with few short setae. One strong *pra* near the suture and another weaker next to the *spal*; prealar area bare. Proepimeron lacking setulae surrounding *prepm*. **Wing:** Clear to yellowish, wing veins very lightly yellowish. Calypter small and white, lower one well-developed (oval in shape), projecting beyond upper

one. Knob of halter dark yellow. **Legs:** Yellow except for black tarsi; *F1* with 3 rows of *p*; 1 row of *pv* very short throughout, except for 2 longer *pv* at apex. *T1* with 1 sub-apical *pd*, 1 apical *v* and 1 apical *pv*; with 1 submedian and 1 apical *ad*. *F2* hardly narrowed at apex; with 1 row of short *av*, sparse near base but tighter in apical  $\frac{1}{3}$ ; with 1 row of short *pv*, but these less evenly developed than row of *av* and partially duplicated in apical  $\frac{1}{3}$ . *T2* hardly narrowed on basal half; ventral pubescence poorly developed and thin,  $0.3 \times$  width of *T2*, semi-decumbent and more conspicuous in apical  $\frac{1}{2}$  than at base of *T2*. *C3* setulose on postero-apical margin. *F3* with 1 row of very short *av* and 2 longer preapical *av*; *pv* surface bare. *T3* with 2 short sub equal *d*; 1 *ad* (slightly basad of the submedian *d*); and 1 *av*. **Abdomen:** Ground colour black; hind margins of tergites and/or sides of tergites 1, 2 and/or corners of tergite 3 sometimes yellow. Sternite 1 setulose. Sternite 5 divided, with setae covering anterior margins (Fig. 11A). **Postabdomen:** Epandrium bell shaped; cercal plate very elongated and terminating in two spines. Surstylus simple, rounded at apex and shorter than epandrium (Fig. 11B,C); phallus sclerotized, basally broad tapering toward apex and curving dorsally (Fig. 11D).

**Female:** Body length 3.5–4.0 mm. Differs from the male as follows: **Legs:** *F2* ventrally bare, except for a thin *av* at base and 1–2 short *av* beyond it. *T2* bare ventrally. **Abdomen:** Ground colour as in male or wholly orange; dusting grey to yellowish grey, with a poorly developed dark median vitta on tergites 3–5. **Postabdomen:** Sternite 8 reduced to two small plates bearing short spines, two cup-shaped spermathecae (Fig. 11E).

**Distribution.** Worldwide in warmer areas, but apparently never abundant (DOMÍNGUEZ & PONT 2015).

**Material.** *Anthomyia peregrinum*. Holotype ♀, ‘Holotype ♀ peregrina | Coll. Winthem’, ‘peregrina ♀; *Euryomma hispaniense* | ♀ | Stein; Holotype ♀ | *Anthomyia* | peregrina Mg. | det. A.C. Pont



**Fig. 12.** *Euryomma rettenmeyeri* Chillcott: A: sternite 5, B: epiandrium lateral, C: epiandrium ventral, D: hypandrium, E: oviscapt and spermathecae. Redrawn from CHILLCOTT (1958).

1981' (see Pont 1986: 237) (NMW). – ARGENTINA, Mendoza, CCT, IADIZA, 23.v.2007, 32°53'39"S 68°52'28"W, Aballay leg. (1♀, 2♂, CEI); Mendoza, CCT, IADIZA, 14.vi.2007, 32°53'39"S 68°52'28"W, Aballay leg. (2♀, CEI). CHILE, Atacama, 21.x.1957, L.E. Peña leg. (6♀, 9♂, CNC); Camarones, Trpca., 6.xi.1955, L.E. Peña leg. (1♂, CNC); Huasco, Atacama, 21.x.1957, L.E. Peña leg. (1♀, CNC); Chorrillos, Atacama, 19.x.1957, L.E. Peña leg. (1♀, CNC); Camarones, Trpca., 5/6.xi.1955, L.E. Peña leg. (1♀, CNC).

### *Euryomma rettenmeyeri* Chillcott, 1958

Fig. 12A–E

*Euryomma rettenmeyeri* Chillcott, 1958: 725; PONT 1972: 2; CARVALHO & PAMPLONA 1979: 603; CARVALHO et al. 1993: 6; GRISALES et al. 2012a: 454–455.

**Differential diagnosis.** Basal antennal segments clear yellow, palpus basally yellowish. Arista yellow at base, bearing long pubescence. Fore femur lacking defined anterodorsal row of setae. Anteroventral seta of hind tibia absent. Thorax with three broad brown vittae. Dorsal setae of hind tibia very long.

**Redescription. Male:** Body length 3.4 mm. **Head:** Eye bare. Frontal vitta dark brown, dark reddish on anterior margin. Two *fr*, with two setulae in between. *Poc* divergent. Fronto-orbital plate, parafacial and gena grey pollinose. Parafacial with 4 short setulae on dorsal fourth. Scape and pedicel yellow, postpedicel  $3 \times$  length of pedicel, dark grey with heavy grey pollinosity; arista yellow in basal  $\frac{1}{5}$ , dark grey apically, bearing long pubescence  $1.5 \times$  width of base of arista. Palpus straight, apex as wide as base, basally yellow, extending along dorsal margin to apical fourth, remainder dark. **Thorax:** Pale yellowish-brown, with 3 brown stripes coinciding with *acr* and *spal*; scutellum pale yellowish brown with 2 subbasal dark brown spots. *Acr* 3:3–4 in irregular rows; 3 *pprn*, 2 strong and 1 weaker, postpronotal area with few setulae; 2 *pra*; 1 anterior, longer near suture, and 1 weaker and placed above first near *spal*; 2 *prepm*,

that closest to spiracle longer; proepimeral area bare; 2 *kepst*, with no distinct medial setulae, katepisternal area covered with short setulae. **Legs:** Dark brown, except for femoral apices and tibial bases. *F1* with 1 row of strong *pd*, as long as femoral width; dorsal surface with 2 weak rows of setae almost indistinguishable from ground setulae and a third even weaker row in between; 1 row of *pv* formed by weak and short setulae basally and 2–3 strong setae at apex; anterior surface covered with short setulae. *T1* with 1 strong subapical *d*; 1 submedian *ad*; 1 apical *v*; 1 apical *pv*. Basal parts of fore tarsomeres 1–5 with short and strong setulae on ventral surface. *F2* with 1 row of short *av*, less than half as long as femoral width, weak, becoming shorter and closer-set apically to form a weak comb; 1 row of short *pv*, less than half as long as femoral width, weak, becoming shorter and closer-set apically to form a weak comb; 1 row of *ad*, only present in median half, and 1 preapical seta separated from row. *T2* only slightly thicker apicad; ventral pubescence short and multiserial; 1 apical *pv*; 1 long and strong apical *v*; 1 apical *av*; 1 submedian and 1 strong and long apical *a*; 1 long and strong apical *ad*; 1 submedian and 1 apical *p*. *C3* with 1 *p* on anterior internal surface. *F3* with 1 row of long *ad*, directed to dorsal surface at apex; 1 row of *av*, setulose except for two setae at apex; posteroventral surface setulose. *T3* lacking *av*; 1 submedian and 1 preapical *ad*; 2 long *d*. Ventral surface on hind tarsomere I strongly setulose. **Wing:** Clear, calypter and halter pale yellowish-white. **Abdomen:** Dark brownish grey pollinose, laterally with pale grey anterior margins, grey pollen expanded laterad to cover anterior half of each segment at margin. Hypopygium weakly projecting. Sternite 5 transversally divided by membranous band, except at lateral margin, produced into short and thick processes bearing 4–5 apical and preapical setae; anterior margin sclerotized and bearing several weak setae, median line with 3 strong and several weak setae (Fig. 12A). **Postabdomen:** Epiandrium shorter than broad, rounded, with 1 strong and several weaker setae; surstylus not fused to epiandrium, basally

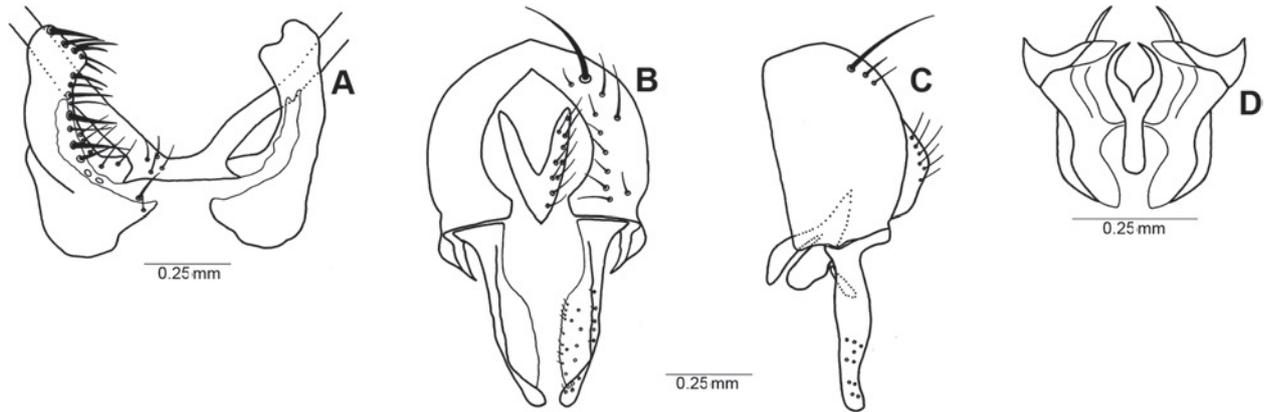


Fig. 13. *Euryomma rufifrons* Stein: A: sternite 5, B: epandrium ventral, C: epandrium lateral, D: hypandrium.

broad with rounded dorsal expansion medially, ventral and mid dorsal margins bearing several bristle-like hairs; cercal plate elongate and slender (Fig. 12B,C); hypandrium broad, interrupted medially, basal flange broad, directed outwards (Fig. 12D).

**Female:** Body length 2.9 mm. Differs from male as follows: **Legs:** *F2* with rows of *av* and *pv* setulose at apex, basally with 5–6 short setae on each surface; hind tibia with strong *av*; *d* shorter (0.5 and 0.7 mm). **Abdomen:** Colour similar to male, except dorsocentral stripe apparent. **Postabdomen:** Sternite 8 strongly modified, with small median sclerite bearing setae and pair of curved processes directed apically enclosing cup shaped depression on each side; sternite 7 slightly produced in anterior margin, and sternite 6 indented in posterior margin; two semicircular and smooth surfaced spermathecae.

**Distribution.** Panama: La Chorrera (Fig. 2).

**Material.** *Euryomma rettenmeyer*. Paratype ♂, 'Barro Colorado I [sland] | Canal zone, Panama | 23-V-1956 No. 1841 | C. W. & M. F. Rettenmeyer', 'Eciton burchelli | Refuse deposit | Colony E- 156 | Stary Day N-2', 'Reared from refuse | Deposit of *Eciton burchelli* | emerged 10-VI', 'PARATYPE | *Euryomma* ♂ | rettenmeyer | No. Chillcott' (CNC). – Paratype ♀, 'Barro Colorado I [sland] | Canal zone, Panama | 23-V-1956 No. 1841 | C. W. & M.F. Rettenmeyer', 'Eciton burchelli | Refuse deposit | Colony E- 156 | Stary Day N-2', 'emerged | 10-VI-56', 'PARATYPE | *Euryomma* ♂ | rettenmeyer | No. Chillcott' (CNC). – PANAMA: Barro Colo. [rado], Is. [land], C. [anal] Z. [one], 9.iii.1955, No. 991. C.W. Rettenmeyer (leg.), 1 m. radius of bivouac, *Eciton burchelli*, Bivouac site, Colony B-IV-S Chillcott det. (1♂, 1♀, CNC).

### *Euryomma rufifrons* Stein, 1911

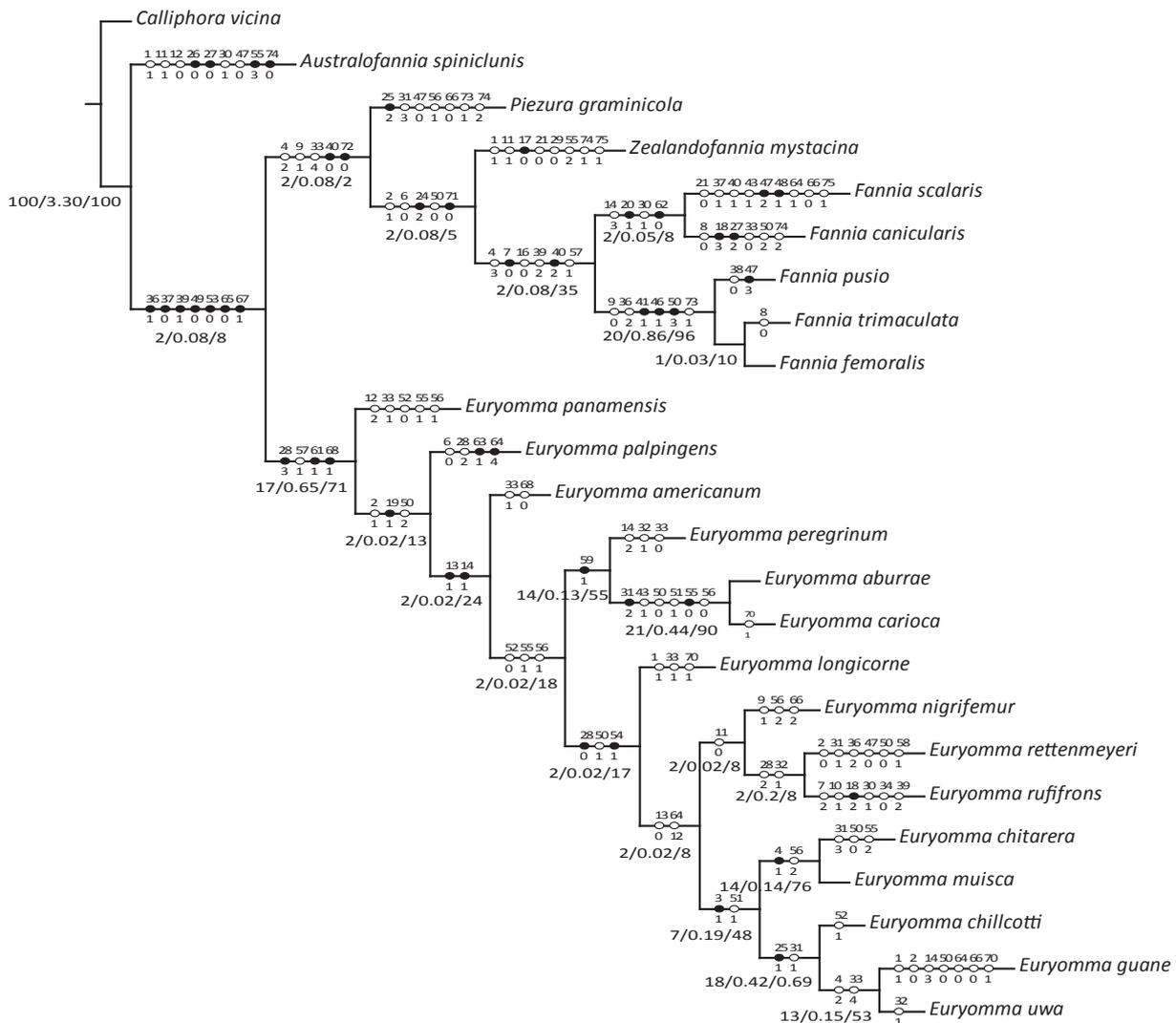
Fig. 13A–D

*Euryomma rufifrons* Stein, 1911: 110; STEIN 1919: 133; SÉGUY 1937: 180; SÉGUY 1941: 55; ORTIZ 1946: 157; ALBUQUERQUE 1956: 5; PONT 1972: 2; CARVALHO & PAMPLONA 1979: 603; CARVALHO et al. 1993: 6; PONT 2013: 50, 124.

**Differential diagnosis.** Frontal vitta orange to dirty red. Scape and pedicel reddish, postpedicel black. Thorax light brown, lacking vittae, first dorsocentral stronger than in the other species of the genus, and half as long

as second dorsocentral; 3 short and strong *pra*. Legs red yellow.

**Redescription. Male:** Body length 3.7 mm. **Head:** Frontal vitta orange to yellow near lunule, broad, at narrowest point  $5.33 \times$  width of anterior ocellus. Frons grey pruinose, at uppermost *fr*  $3.3 \times$  width of anterior ocellus. Two long *fr*,  $1.2 \times$  length of postpedicel, with six shorter interstitials. One row of short orbital setulae. Eye bare. One row of *pocl*. Facial ridge and parafacial grey, parafacial at base of postpedicel  $0.6 \times$  width of same and setulose throughout. Gena slender, depth below lowest eye-margin less than width of postpedicel. Facial carina yellow-grey. Scape and pedicel yellow; postpedicel grey,  $1.8 \times$  as long as broad and covered with short pubescence. Arista dark brown and short pubescent. Palpus brown, straight. Inferior oral margin straight. **Thorax:** Light grey dusted with thin and very light brown vittae along *acr*, *dc*, and *ia* lines. First *dc* longer than in other species, half as long as second *dc*. Scutellum grey at tip. Presutural *acr* biserial, postsuturally triserial. One pair of strong prescutellar *acr* s. Postpronotal lobe with 2 setae and 10 setulae. Three *pra* of equal length, 1 near suture and other 2 next to *spal*; prealar area bare. Proepimeron lacking setulae surrounding *prepm*. **Legs:** Femora and tibiae light brownish, tarsi dark brown. *F1* with 1 row of long *pd*; 3 rows of *p*; 1 row of *pv* short at base and longer in apical half. *T1* with 1 subapical and 1 submedian *pd*, 1 apical *v* and 1 apical *pv*; with 1 submedian and 1 apical *ad*. *F2* narrowed at apex; with 1 row of very short *ad*, almost indistinguishable from ground setulae except for apical seta; 1 row of *av*, sparse near base but tighter in apical  $\frac{1}{3}$ ; 2 rows of *pv*, these hooked at tip and partially tripled in apical  $\frac{1}{3}$ . *T2* narrowed on basal half; ventral pubescence well developed and thin,  $0.3 \times$  width of *T2*; with 1 long subapical *ad*; 1 submedian *a*; 3 apical *av*; 1 long apical *v*; 1 submedian *pd* (apicad of submedian *a*) and 1 apical *p*. *C3* with 1 seta on postero-apical margin. *F3*: with 4 *ad* at apex; 1 row of very short *av* except for 2 longer preapical *av*; *pv* setulose. *T3* with 2 short subequal *d*; 2 *ad* (one slightly basad of the submedian *d* and the other subapical); 1 submedian *av*; 1 apical *v*. **Wing:** Clear to yellowish, wing veins very lightly yellowish. Calypter small and



**Fig. 14.** Tree obtained using implied weights with concavity constant value = 3. Absolute and relative Bremer supports and Symmetric resampling values are indicated below each node. Apomorphies are indicated on each node, unique synapomorphies are indicated as ●, homoplasies are indicated as ○, and character number is indicated above each circle.

white, lower one well-developed (oval in shape), projecting beyond upper one. Knob of halter dark yellow. **Abdomen:** Ground colour grey. Sternite 1 setulose. Sternite five formed by two plates, with strong bristles on posterior part (Fig. 13A). **Postabdomen:** Epandrium as long as broad, with very long lateral margins reaching first  $\frac{1}{4}$  of surstylus, with 1 strong and several weaker setae; surstylus not fused to epandrium, basally somewhat thinner, broader and flat towards apex; cercal plate elongate and slender (Fig. 13B,C); hypandrium broad, interrupted medially, basal flange broad, directed outwards (Fig. 13D).

**Female:** Unknown.

**Distribution.** Chile: IV region of Coquimbo, V region of Valparaiso (**new record**) (Fig. 4).

**Material.** *Euryomma rufifrons*. Holotype ♂, 'Chile | 22-XI-02/ Guayacan', 'Coll. W. Schnuse | 1911-3'; 'Euryomma | rufifrons | sp. n.', 'Holotype ♂ | Euryomma | rufifrons | Stein, 1911 | Conf. A. C. Pont 1999' (SMTD). – CHILE: Santiago, El Tabo, 23.i.1957, L.E. Peña (2♂, CNC).

*Euryomma uwa* Grisales, Wolff & Carvalho, 2012

*Euryomma uwa* Grisales et al., 2012b: 826; GRISALES et al. 2016: 2. Full description in GRISALES et al. (2012b).

**Differential diagnosis.** Frontal vitta dark brown with golden yellow pollinosity; 4 *fr*; length of postpedicel  $2.5 \times$  the length of pedicel; arista with short pubescence, rays shorter than width of base of arista; scutum with five brown vittae, median vitta expanded from base to apex of scutellum, dorsocentral vitta reaching the basal scutellar setae; *F2* with a ctenidium of 3–4 *pv* rows of hooked setae; calypter whitish; wing faintly brownish, with apical third, between C vein and apical half of vein  $R_{2+3}$  darkened; halter yellow; male sternite 5 wide, with two concave, elongate and sclerotized plates, plates bearing strongly developed setae.

**Remarks.** See remarks for *E. chillcotti*.

**Distribution.** Colombia: department of Santander (Fig. 2).

**Table 2.** Homoplasy for each character (character number = combination of first column and first line) expressed as units of fit. Fit of a character measured as a concave function of its homoplasy (GOLOBOFF 1993).

	0	1	2	3	4	5	6	7	8	9
	0.4	0.5	0.5	0	0.4	0.4	0.4	0.25	0.4	0.4
10	0.5	0.5	0.7	0.25	0.4	—	0.25	—	—	0
20	0	0.4	0.4	—	0	0	—	—	0.5	0.25
30	0.4	0.4	0.625	0.7	0.4	0.25	0.25	0.25	0.25	0.25
40	0.625	0	0.4	0.4	—	0.4	0	0.4	—	0.25
50	0.66667	0.57143	0.57143	0.25	0	0.4	0.625	0.25	0.57143	0
60	—	0	0	—	0.57143	0.4	0.7	0	0.25	0.25
70	0.4	0	0	0.4	0.5	0.4				

## 5. Phylogenetic results

Searches yielded 1 tree of fit 21.45238 (Fig. 14). *Australofannia spiniclunis* was placed as the sister taxon to all other Fanniidae which formed two clades, one including the exemplar taxa of *Piezura*, *Zealandofannia* and *Fannia*, and the other including all species of *Euryomma*. The tree (Fig. 14) showed *E. panamensis* as the sister species to all remaining species of *Euryomma*, followed by *E. palpingens* and *E. americanum*. The species *E. peregrinum* + *E. carioca* + *E. aburrae* formed a sister group to *E. longicorne* and two groups: one formed by *E. nigrifemur* + *E. ruffifrons* + *E. rettenmeyeri* and another formed by *E. muisca* + *E. chitarera* + *E. chillcotti* + *E. guane* + *E. uwa*. Support measures for the monophyly of the genus and most internal groups were low, with the exception of node 36 (*E. carioca* + *E. aburrae*).

## 6. Discussion

The tree obtained with implied weights was fully resolved and the genus *Euryomma* was recovered as a monophyletic unit, although support measures were low for the genus and in general below the genus level, except for very few species groups. Many characters are highly homoplasious (Table 2) and the use of implied weights reduced the possibility of groupings based on strongly homoplasious characters such as leg chaetotaxy, because they were down weighted during the process, as explained by GOLOBOFF et al. (2008).

Four character states supported the monophyly of *Euryomma*: 3 rows of setae on posterior surface of fore femur (28<sup>3</sup>); cercal plate weakly fused, this character state is shared with the included species of *Fannia* (57<sup>1</sup>); postgonites reduced to tiny stubs at side of phallus (61<sup>1</sup>); and hypandrium divided medially (68<sup>1</sup>). The characters traditionally used as diagnostic for the genera such as: dichoptic head in both sexes, no sexual dimorphism (0<sup>0</sup>); one strong presutural *dc*, the anterior one hardly distinct from the ground-setulae (16<sup>1</sup>); imaginary extensions of first ( $A_1 + CuA_2$ ) and second ( $A_2$ ) anal veins meeting be-

fore wing margin (24<sup>1</sup>) are shared with the genera *Piezura*, *Zealandofannia* and *Australofannia*.

Within the Fanniidae, the position of *Australofannia* as the sister-group to all remaining species of the family, as was also found in DOMÍNGUEZ & ROIG-JUÑENT (2008), is due to the presence of a plesiomorphic feature: the ejaculatory apodeme (PONT 1977). The absence of this structure has been considered an autapomorphy of the family. Unlike DOMÍNGUEZ & ROIG-JUÑENT (2008) the remaining outgroup taxa formed a monophyletic group with *Piezura* and *Zealandofannia* as sister groups of the species of the genus *Fannia* chosen as outgroups. We included Neotropical representatives of the *canicularis* species-group because HENNIG (1965) considered the genus *Fannia* to be paraphyletic because this species-group formed a monophyletic group with *Euryomma* and *Piezura*. This latter monophyletic group proposed by HENNIG (1965) was not recovered by DOMÍNGUEZ & ROIG-JUÑENT (2008), although only one species of *Euryomma* and *Piezura* were included in the analysis. In this study, and as found by DOMÍNGUEZ & ROIG-JUÑENT (2008), the species belonging to the *canicularis* species-group did not form a monophyletic unit, and did not group with *Euryomma* and *Piezura*.

Because of the low support values, little can be said with confidence about the internal phylogeny of the genus. Nonetheless, results converge on general patterns of relationships within the genus *Euryomma*. *Euryomma panamensis*, *E. palpingens* and *E. americanum* are the sister species to two large groups within *Euryomma*: one formed by three species (*E. peregrinum*, *E. aburrae*, *E. carioca*) and the other formed by the remaining nine species. CHILLCOTT (1961) considered *E. americanum* as the western North American counterpart of *E. peregrinum* (he found the latter to be more predominant in eastern North America), but our analysis shows that *E. americanum* is more closely related to *E. carioca* and *E. aburrae* with which it shares character state (59<sup>1</sup>) – the presence of a thin posterior prolongation of the cercal plate.

The remaining nine species of *Euryomma*, with *E. longicorne* at the base, are divided into two groups: one formed by *E. nigrifemur*, *E. rettenmeyeri* and *E. ruffifrons*, which share character state (11<sup>0</sup>) – thin palpi; and a second group formed by the species *E. chitarera*, *E. muisca*, *E. chillcotti*, *E. guane* and *E. uwa*, which is supported by

character state (3<sup>1</sup>) – pilose eyes and (51<sup>1</sup>) – sternite 1 bare. Within the latter group, *E. chillcotti*, *E. guane* and *E. uwa* share character state (25<sup>2</sup>) – wings light brown tinted, with apical third between C vein and apical half darker, and character state (31<sup>1</sup>) – anterodorsal row of setae of mid femur present only in apical half.

This is the first phylogenetic analysis of the genus *Euryomma*, and the low supports for all of the groups within the genus (Fig. 2), with the only exception of *E. carioca* + *E. aburrae* (we have suggested that these two species may be synonyms), indicate the need for additional data from molecular data and immature stages. There is no previous hypothesis regarding the definition of species groups in terms of morphological characters contrary to the situation within the larger genus *Fannia* (DOMÍNGUEZ & ROIG-JUÑENT 2008). External morphological characters show a higher level of homoplasy than in *Fannia*, where the males of *Euryomma* are very similar in leg and thorax chaetotaxy. Male chaetotaxy in the genus *Fannia* allows the definition of many species-groups (DOMÍNGUEZ & ROIG-JUÑENT 2008), but the genus *Euryomma* does not show the striking sexual dimorphism of *Fannia*. And although characters from male and female genitalia were not as homogenous, they did not provide strong evidence for group support and in many cases the female genitalia is unknown.

The known distribution ranges of many species of *Euryomma* have been extended in this revision, but still very little is known of the distribution of each species. Many species, such as *E. chitarera* which was described from Colombia, has been also found in Argentina, leaving the gap between these two localities to explore for further information. Many species of *Euryomma* show this disjunct pattern of distribution, e.g. *E. nigrifemur* described by STEIN (1911) from Chile, has been recently collected in Colombia, Costa Rica and Nicaragua (Fig. 3), indicating that a picture of the fauna of *Euryomma* is still far from complete and does not allow us to make any biogeographical interpretation. We hope that further studies on this fascinating genus will reveal interesting evolutionary and biogeographical patterns.

## 7. Acknowledgments

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