

IL NATURALISTA VALTELLINESE - Atti Museo civ. Storia naturale Morbegno, 28 (2017): 47-64

Three new species of Ephutini (Hymenoptera: Mutillidae) from Venezuela and Ecuador, including taxonomic changes for seven Neotropical species of *Ephuta*

ROBERTO A. CAMBRA¹, DIOMEDES QUINTERO A.¹, GUIDO PAGLIANO²

¹Museo de Invertebrados G. B. Fairchild, Universidad de Panamá, 0824, Estafeta Universitaria, Panamá, República de Panamá. E-mail: cambramiup60@gmail.com dquinter666@gmail.com

²Università degli Studi di Torino-Dipartimento de Scienze Agrarie, Forestali e Alimentari. Lago Braccini 2, 1-100995 Grugliasco (TO). E-mail: guido@pagliano.eu

ABSTRACT - *Ephuta tunesae* Cambra, Pagliano & Quintero n. sp., *Onoretilla williamsi* Cambra, Quintero & Pagliano n. sp., both from Ecuador, and *Onorerilla merida* Cambra, Quintero & Pagliano n. sp., from Venezuela, all based on male specimens, are described and illustrated. A key for species of *Onoretilla* Pagliano is given. The following seven species are transferred to *Ephuta* from *Mutilla*: *Ephuta consanguinea* (Smith) new comb., *Ephuta crassicornis* (Smith) new comb., *Ephuta crux* (Smith) new comb. and a new distribution record for Venezuela, *Ephuta detracta* (Smith), new comb., *Ephuta discursa* (Smith) new comb. and a new distribution record for Bolivia, *Ephuta gratiosa* (Smith) new comb., *Ephuta venatrix* (Smith) new comb.

Key words: *Ephuta*, Mutillinae, *Onoretilla*, Neotropical, , new combinations, new distribution records.

RIASSUNTO - Tre nuove specie di Ephutini (Hymenoptera: Mutillidae) di Venezuela ed Ecuador, e cambiamenti tassonomici di sette specie Neotropical species of *Ephuta*. Sono descritte ed illustrate sulla base di esemplari maschi *Ephuta tunesae* Cambra, Pagliano & Quintero n. sp., *Onoretilla williamsi* Cambra, Quintero & Pagliano n. sp., entambe dell'Ecuador, e *Onorerilla merida* Cambra, Quintero & Pagliano n. sp., del Venezuela. Viene inoltre riportata una chiave delle specie del genere *Onoretilla* Pagliano. Le seguenti sette specie sono traferite dal genere *Ephuta* al genere *Mutilla*: *Ephuta consanguinea* (Smith) new comb., *Ephuta crassicornis* (Smith) new comb., *Ephuta crux* (Smith) new comb. e nuovi dati di distribuzione per il Venezuela, *Ephuta detracta* (Smith), new comb., *Ephuta discursa* (Smith) new comb. e nuovi dati di distribuzione per la Bolivia, *Ephuta gratiosa* (Smith) new comb., *Ephuta venatrix* (Smith) new comb.

Parole chiave: *Ephuta*, Mutillinae, *Onoretilla*, Neotropical, nuova combinazione, nuova distribuzione.

Introduction

Ephuta Say, 1836 and *Onoretilla* Pagliano, 2017 are New World mutillid genera of Mutillinae. The first genus is distributed from Canada to Argentina but absent in Chile (SCHUSTER, 1945, 1951, 1956; CASAL, 1968a, 1968b; NONVEILLER, 1990). With about 240 described species, is one of most diverse mutillid's genera for America (QUINTERO & CAMBRA, 1996). The genus *Onoretilla* is known by only one male species from Ecuador and Colombia (PAGLIANO ET AL., 2017).

The biology for *Ephuta* is poorly known, with only eight host records, all Pompilidae, for seven described and one unidentified species of *Ephuta* (SCHUSTER, 1951; EVANS & YOSHIMOTO, 1962; KROMBEIN & NORDEN, 1996; KIMSEY, 1980; ZANETTE ET AL. 2004; LOYOLA & MARTINS, 2006; CAMBRA ET AL., 2017). For *Onoretilla* the hosts are unknown.

The purpose of this paper is to describe three new species of Ephutini: One *Ephuta* and two *Onoretilla*, all based on males from Venezuela and Ecuador; taxonomic changes are also presented for seven Neotropical species of *Ephuta* from South America.

Materials and methods

Specimens were photographed with an Olympus Stylus digital camera using stereomicroscope LEICA M 165 C, with further image processing done using ArcSoft PhotoStudio. Measurements were made with a calibrated micrometer scale attached to an ocular lens of the stereomicroscope. The length of tergum one was measured from above. The right wing of holotype was cut, placed on a slide and transferred to a separate box. The male genitalia were stored in glass vials and pinned with the specimen.

The following abbreviations are used:

T = metasomal terga, S = metasomal sterna.

AMNH = American Museum Natural History, New York.

BMNH = The Natural History Museum, London.

MIUP = Museo de Invertebrados G. B. Fairchild, University of Panama.

OXUM = Hope Entomological Collections, University Museum, Oxford.

USNM = National Museum of Natural History, Smithsonian Institution, Washington, DC.

Results

Ephuta (Ephuta) tunesae Cambra, Quintero & Pagliano n. sp. (Figs. 1-5, 12-14). **Type material.**- Holotype ♂. Ecuador, Pichincha, Unión del Toachi, 950 m, 00°21'05" S 78°57'10" W, 10-30 May 2003, I.G.Tapia (MIUP). Paratype ♂. Ecuador, Pichincha, Unión del Toachi, Otongachi, IV 2003, leg. G. Onore, collezione Pagliano.

Diagnosis - Integument of pronotum, mesoscutum, scutellum and tegula orange-red (Fig. 1), S7 mostly yellow; humeral angle carinate; scutellum dorsum almost flat, without projections; tegula basal fourth with a distinctive median longitudinal ridge; propodeum dorsal and posterior face not separated by a transverse carina; mesopleuron evenly convex; T1 dorsal face 0.80 × as long as maximum wide; T2 evenly convex throughout; hypopygium apex almost straight, without denticles or tubercles.

The male of *Ephuta tunesae* n. sp. runs in Casal's key (1968b) to couplet 44. It is similar to *E. guasuncha* Casal, 1968, distributed in Brazil, Bolivia and Argentina. The two species can be separated as follows: in *E. tunesae* the pronotum and mesoscutum are orange-red; the dorsum and posterior face of the propodeum are not separated by a transverse carina; S7 integument mostly yellow; in *Ephuta guasuncha* the mesosoma is black; dorsum and posterior face of the propodeum separated by a transverse carina; the S7 integument is black.

In Mickel's key (1952), *E. tunesae* runs to couplet 6. It is similar to *Ephuta fugax* (Smith, 1879), distributed in Guyana, Guiana and Brazil. The two species can be separated as follows: in *E. tunesae* the pronotum and mesoscutum are orange-red, scutellum posterior margin not emarginate, posterior margin of T2 with a dense transverse band of decumbent white setae; in *E. fugax* the mesosoma is black, scutellum posterior margin emarginate, posterior margin of T2 without a transverse band of decumbent white setae.

Description of holotype

Body length 7.2 mm. *Color*: Integument black, except orange-red mandible, pronotum, mesoscutum and tegula; S7 yellow except black apex; tibial spurs pale whitish; wings subhyaline, weakly infuscated; frons and vertex with dense, erect and decumbent, pale white setae; pronotum, mesoscutum, tegula and dorsum of scutellum with erect and decumbent pale golden setae; metanotum, propodeum, meso- and metapleuron with erect and decumbent white setae; T1 with long sparse erect and dense decumbent white setae; T2 with sparse semierect white setae, except posterior margin with dense transverse band of decumbent white setae concealing integument; T3–T7 and S1–S7 totally with sparse, erect and semierect, white setae. *Head*. Transverse in dorsal view, frons, vertex and gena with medium-sized, very close punctures; ocelli small, distance between eye margin and lateral ocellus $3.5 \times$ as long as diameter of ocellus; clypeus with two longitudinal carinae on discal area, both diverging and terminating before anterior margin; mandible slender, with a small tooth within near tip; ventral margin smooth, without a process or tooth; scape with two longitudinal carina below; first flagellomere approximately as long as second. *Mesosoma*. Dorsum of pronotum and mesoscutum with large, contiguous or confluent punctures, sides of pronotum mostly smooth; humeral angle carinate (Fig. 3); scutellum with medium-sized, very close punctures, dorsum almost flat, without projections, posterior margin not emarginate; tegula with small separated punctures, basal fourth with a distinctive median longitudinal ridge, latero-posterior border convex; dorsum and posterior face of propodeum broadly reticulate, not separated by a transverse carina, without median tubercle, lateral area with a small round projection; mesopleuron evenly convex throughout, with medium-sized contiguous punctures; metapleuron mostly impunctate; forewing (Fig. 5) with three submarginal and two discal cells, veins 3rs-m and 2m-cu faintly indicated; coxae without denticle, tubercle or carina. *Metasoma*. First segment cylindrical; T1 dorsal face $0.80 \times$ as long as maximum wide; T1 with large close punctures, T2 evenly convex throughout, not at all flattened, with medium-sized punctures, more sparse on discal area and contiguous on lateral areas; T3–T7 and S3–S7 with small sparse punctures; S1 with a median longitudinal keel, elevated in anterior area (Figs. 2, 4); S2 mostly with medium-sized close punctures; hypopygium discal area convex, apex weakly sinuate, without denticles or tubercles;

paramere (Figs. 12-13) curved, with apex simple, basal half broad, distal half gradually narrowing toward apex, with a few setae; cuspis (Fig. 12-13) broad and with many setae; penis valve narrow (Fig. 14), with short apical spine and with large setae on apical dorsal margin.

Etymology.- Named in honor of Maria Luisa Tunes Buschini, Universidade Estadual do Centro-Oeste, Parana, Brazil, for his contributions to the knowledge of Neotropical Hymenoptera.

Key for males of *Onoretilla* Pagliano (females are not known)

1. Body with sparse long erect and dense short decumbent golden setae; scape, pedicellus, legs and T7 yellow-orange; S1 apex with a low and short transverse elevation forming two contiguous small tubercles; integument metallic blue and purplish only at certain light angles ***williamsi*** n. sp.
- . Body with sparse long erect and dense short decumbent white pale setae; scape, pedicellus, legs and T7 mostly metallic blue; S1 apex without transverse elevation; integument metallic blue distinctive 2
2. S1 with distinctive longitudinal carina from anterior to posterior margin; mesoscutum with contiguous punctures, anterior half with large and dense setae, mostly covering integument (Fig. 10); Venezuela ***merida*** n. sp.
- . S1 without longitudinal carina from anterior to posterior margin; mesoscutum with spaced punctures, anterior half with medium-sized setae, mostly not covering integument; Colombia, Ecuador ***romanoi*** Pagliano et al.

Comments on a diagnostic generic character: The large preapical spine (Figs. 17, 20) present in the penis valve of all species of *Onoretilla* is another morphological character that allows recognition of the genus, because no other genus of Ephutini presents this large preapical spine. The penis valves most similar to *Onoretilla*'s species are those present in *Ephusuarezia* Casal (Ephutini) and *Ephuta* (*Ephutopsis*), species that have broad penis valve with an apical spine and two small preapical spines (See CASAL 1968a, Figs. 17-20).

Ecology of *Onoretilla*: The species of *Onoretilla* Pagliano are confined to the Andes mountain range of Ecuador, Venezuela and Colombia, distributed in altitudes between 1800 m to 2600 m.

***Onoretilla williamsi* Cambra, Quintero & Pagliano n. sp.** (Figs. 6-9, 15-17)

Type material: Holotype ♂. Ecuador, Napo, Pastaza, Sebundbi, 2600 m., 11-15. ix.1977, col. L. Peña (MIUP).

Description of holotype

Body length 12.2 mm. *Color*: Integument black with metallic blue and purplish reflections at certain light angles, except yellow-orange scape, pedicellus, mandible, tegula, legs and T7 (Figs 6-8); tibial spurs and hypopygium pale whitish; wings subhyaline; body covered with, sparse long erect and dense short decumbent, golden setae (Figs. 6-9). *Head*. Transverse in dorsal view, frons, vertex and gena with medium-sized punctures; ocelli distance between eye margin and lateral ocellus $3.4 \times$ as long as diameter of ocellus; clypeus mostly convex, with two longitudinal carinae reaching discal area, both jointed between base of scape to form a broad semicircular carina; mandible slender, with a small tooth within near tip; ventral margin smooth, without a process or tooth; scape with two longitudinal carina below; first flagellomere approximately as long as second. *Mesosoma*. Pronotum mostly with medium-sized contiguous punctures, humeral angle smooth (Fig. 7); mesoscutum with small separate punctures; scutellum with medium-sized close punctures, gibbous, evenly convex from anterior to posterior margins, without either posterior face, emargination or projections; tegula with small separated punctures, without a median longitudinal ridge; dorsum of propodeum with small reticulations, without either a transverse carina or median tubercle; propodeum lateral area rounded, not angulate or tuberculate; mesopleuron without tubercle and mostly convex, anterior or third with contiguous micropunctures, other with sparse small punctures and micropunctures intermixed; metapleuron mostly with contiguous micropunctures; forewing with three submarginal and two discal cells, veins 3rs-m and 2m-cu faintly indicated; coxae without denticle, tubercle or carina. *Metasoma*. First segment very long and subcylindrical (Fig 6), slightly widened towards the apex; T1 basal half flat, apical half distinctly convex (Fig. 9); T1 dorsal face $2.5 \times$ as long as maximum wide; T1 laterally and convex dorsal area with large close

punctures, medial longitudinal dorsal area, before convexity, smooth; T2 evenly convex throughout, not at all flattened, T2-T6 and S2-S6 with small sparse punctures and micropunctures between them; T7 with small dense punctures; S1 without median longitudinal carina, apex with a low and short transverse elevation forming two contiguous small tubercles; hypopygium apex almost straight, without denticles or tubercles; paramere (Figs. 15-16) curved, with apex simple, basal half broad, distal half gradually narrowing toward apex, with a few setae; cuspis (Fig. 15) narrowing to apex and with many setae; penis valve broad in medial area (Fig. 17), with very large apical and preapical spine, with large setae on apical dorsal margin and ventral margin near to base of preapical spine.

Etymology: Named in honor of Kevin A. Williams, California Department of Food & Agriculture, U.S.A., for his taxonomic contributions to the knowledge of Mutillidae.

Onoretilla merida Cambra, Quintero & Pagliano **n. sp.** (Figs. 10-11, 18-20)

Type material: Holotype ♂. Venezuela, Merida, Mucuy nr. Tabay, 30.iv.1981, 2300 m, Masner & Marsh (MIUP). Paratypes: Venezuela: Merida, Tabay-Mucuy, Sendero Truchícola, 2300 m, 17.vi. – 3.vii.1989, trampa interceptación, selva nublada, S. & J. Peck, 1♂ (MIUP); Trujillo, Agua Blanca, Boconó, nr. 1800 m, viii.1992, J. García, 1♂ (MIUP).

Body length 14.5 mm. *Color:* Integument mostly metallic blue (Figs. 10-11), except blackish tarsi, tegula purplish; tibial spurs and hypopygium pale whitish; wings subhyaline; body covered with, sparse long erect and dense short decumbent, white pale setae. *Head.* Transverse in dorsal view, frons, vertex and gena with medium-sized contiguous punctures; ocelli distance between eye margin and lateral ocellus $3.5 \times$ as long as diameter of ocellus; clypeus mostly convex, with two longitudinal carinae reaching discal area, both jointed between base of scape to form a semicircular carina; mandible slender, with a small tooth within near tip; ventral margin smooth, without a process or tooth; scape with two longitudinal carina below; first flagellomere approximately as long as second. *Mesosoma.* Pronotum mostly, mesoscutum and scutellum totally with medium-sized contiguous punctures (Fig. 10); scutellum gibbous, evenly convex from anterior to posterior margins, without either posterior face, emargination or

projections; tegula with small punctures, without a median longitudinal ridge; dorsum of propodeum with small reticulations, without either transverse carina or median tubercle; propodeum lateral area rounded, not angulate or tuberculate; mesopleuron without tubercle and mostly convex, anterior third with contiguous micropunctures, other with sparse small punctures and micropunctures intermixed; metapleuron mostly with contiguous micropunctures; forewing with three submarginal and two discal cells, veins 3rs-m and 2m-cu faintly indicated; coxae without denticle, tubercle or carina. *Metasoma*. First segment very long and subcylindrical, slightly widened towards the apex (Fig. 11); T1 basal half flat, apical half distinctly convex; T1 dorsal face 2.2 × as long as maximum wide; T1 laterally and convex dorsal area with large close punctures; T2 evenly convex throughout, not at all flattened, T2-T6 and S2-S6 with small sparse punctures and micropunctures between them; T7 with small dense punctures; S1 without median longitudinal carina; hypopygium apex almost straight, without denticles or tubercles; paramere (Figs. 18-19) curved, with apex simple, basal half broad, distal half gradually narrowing toward apex, with a few setae; cuspis (Fig. 18) narrowing to apex and with many setae; penis valve broad in medial area (Fig. 20), with medium-sized apical spine and large preapical spine, with large setae on apical dorsal edge and ventral margin near to base of preapical spine.

Etymology: This species is named after the Merida State in Venezuela, where the holotype was collected.

NEW COMBINATIONS (All type material at BMNH was examined by RAC)

Ephuta (Ephuta) consanguinea (Smith, 1855) **New Combination** (Figs. 21-22)

Mutilla consanguinea Smith, 1855. Cat. Hym. Br. Mus. 3: 57, female, Para [Brazil]. B.M. Type Hym. 15.1024, BMNH. NONVEILLER (1990): *incerta sedis*.

Ephuta (Ephuta) crassicornis (Smith, 1879) **New Combination** (Figs. 23-24)

Mutilla crassicornis Smith, 1879. Descr. N. Spec. Hym. Br. Mus. p. 208, [Ega, Brazil]. B.M. Type Hym. 15.1018, Lectotype from Ega designated here. NONVEILLER (1990): *incerta sedis*.

Comments: SMITH (1879) mentioned specimens from “Ega, St. Paulo and Obydos, on the Amazons”. Other two specimens (St. Paulo and Obydos) examined by RAC, each specimen with a yellow rounded label named as cotype.

***Ephuta (Ephuta) crux* (Smith, 1855) New Combination** (Figs. 25-26)

Mutilla crux Smith, 1855. Cat. Hym. Br. Mus. 3: 56, female, Colum[bia]. Type Hym: 161, Hope Ent. Collection, Oxford, examined by R. Cambra. NONVEILLER (1990): *incerta sedis*.

Material examined: COLOMBIA: Narino, La Planada, C. Estrada, 1F (AMNH); Oroque, Santander del Norte, Jun 1965, 1F (MIUP). VENEZUELA: Merida, Timotes, 25 Nov 1969, 1F (MIUP); Timotes, m 2200, 23 Jan 1968, Nordon leg., 1 female (AMNH).

Distribution: Colombia and Venezuela. First distribution record for Venezuela.

***Ephuta (Ephuta) distracta* (Smith, 1879) New Combination** (Figs. 27-28)

Mutilla distracta Smith, 1879. Descr. N. Spec. Hym. Br. Mus. p. 209, female, [Sao Paulo]. B.M. Type Hym. 15.1003. NONVEILLER (1990): *incerta sedis*.

***Ephuta (Ephuta) discursa* (Smith, 1879) New Combination** (Figs. 33-34)

Mutilla discursa Smith, 1879. Descr. N. Spec. Hym. Br. Mus. p. 210, female, Para [Brazil]. B.M. Type Hym. 15.1006. NONVEILLER (1990): *incerta sedis*.

Material examined: (USNM). BOLIVIA: Beni, [Cachuela Esperanza], March, Wm. M. Mann, Mulford Biol. Expl. 1921-1922, 1F. The specimen is labeled with the following information: Compared with type/*Ephuta discursa* (Smith)/det. Mickel 1931.

Distribution: Brazil and Bolivia. First distribution record for Bolivia.

Comments: Smith (1879) named this species as *Mutilla discursa*, but the type label is written *Mutilla discursor*.

***Ephuta (Ephuta) gratiosa* (Smith, 1855) New Combination** (Figs. 31-32)

Mutilla gratiosa Smith, 1855. Cat. Hym. Br. Mus. 3: 46, female, Santarem, Braz[il]. B.M. Type Hym. 15.882. NONVEILLER (1990): *incerta sedis*.

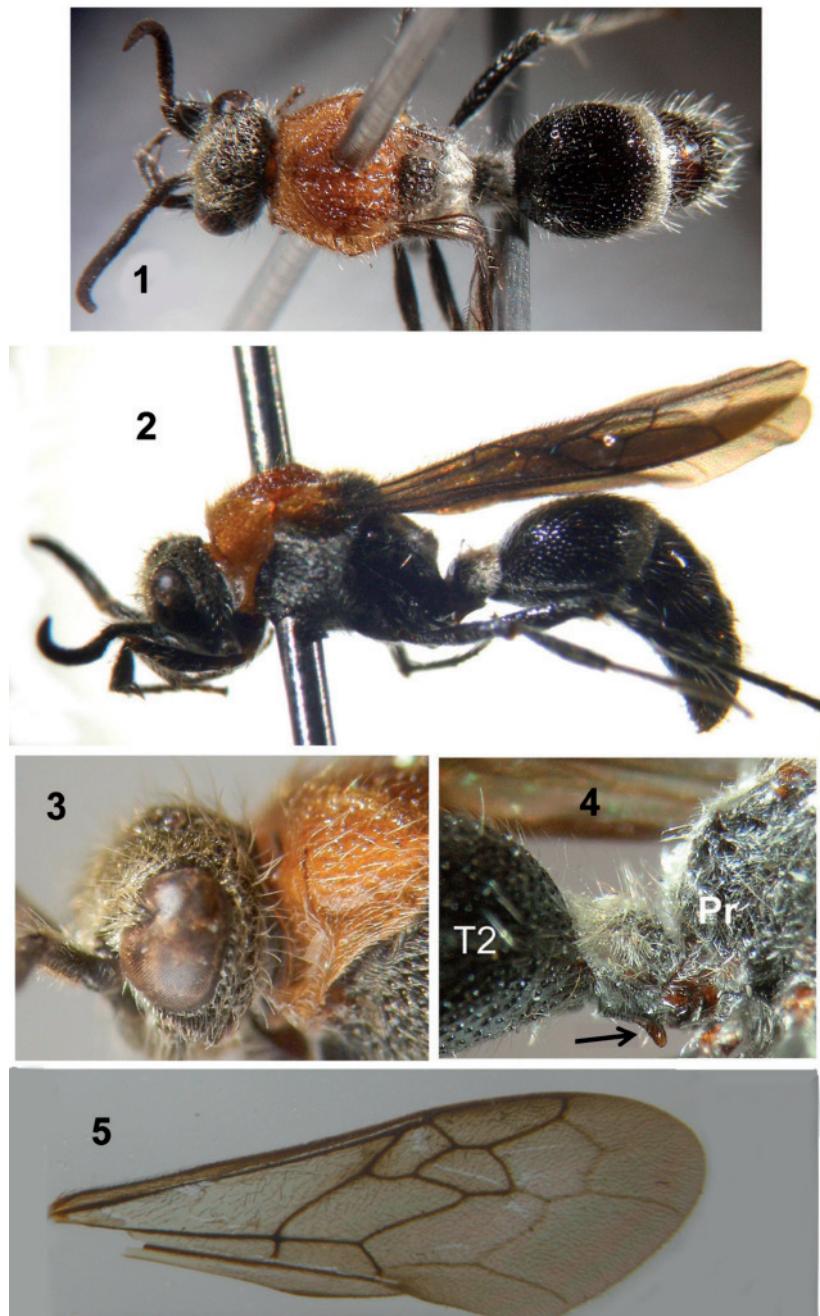
Comments: Smith (1855) named this species as *Mutilla gratiosa*, but the type label is written *Mutilla graciosa*.

***Ephuta (Ephuta) venatrix* (Smith, 1879) New Combination** (Figs. 29-30)

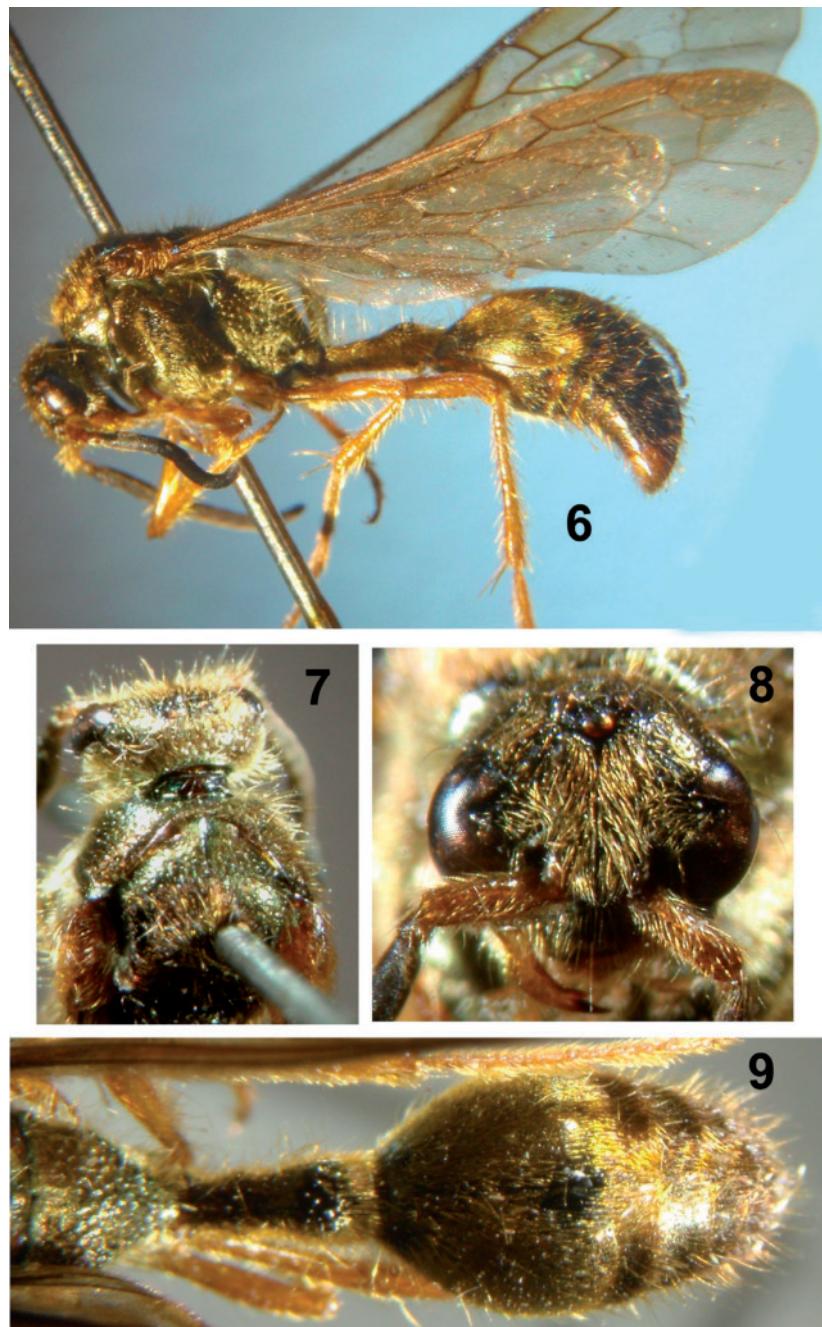
Mutilla venatrix Smith, 1879. Descr. N. Spec. Hym. Br. Mus. p. 210, female, [Ega, Brazil]. B.M. Type Hym. 15.989. NONVEILLER (1990): *incerta sedis*.

Acknowledgements

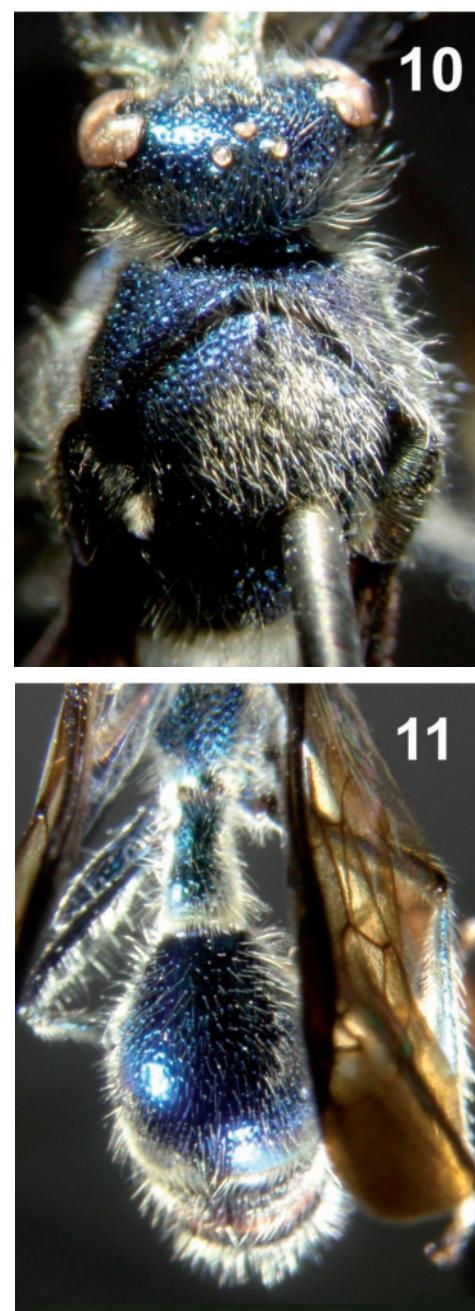
To Jaswinder Boparai, BMNH, for photos of type specimens and their labels; Christopher O'Toole, OXUM, and James M. Carpenter, AMNH, for loan of specimens.



Figures 1-5 *Ephuta tunesae*, holotype. 1. Habitus, dorsal view, 2. Habitus, lateral view, 3. Carina of humeral angle of pronotum, 4. Median longitudinal keel of S1 (Abbreviations: Pr = propodeum, T2 = tergum 2), 5. Forewing.



Figures 6-9 *Onoretilla williamsi*. 6. *Habitus, lateral view*, 7. *Head, pronotum and mesoscutum, dorsal view*, 8. *Head, frontal view*; 9. *Metasoma, dorsal view*.



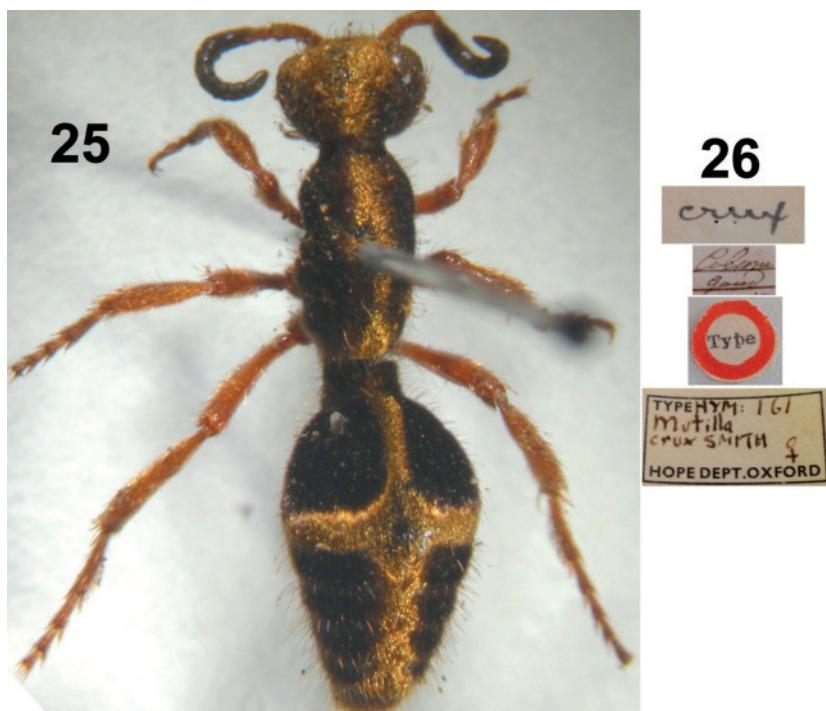
Figures 10-11 *Onoretilla merida*. 10. Head, pronotum, mesoscutum, dorsal view.
11. Metasoma, dorsal view.



Figures 12-20 Genitalia. 12-14. *Ephuta tunesae*, 12. Lateral view, 13. Ventral view, 14. Penis valve, lateral view, 15-17. *Onoretilla williamsi*, 15. Lateral view, 16. Ventral view, 17. Penis valve, lateral view (AP = Apical spine, PA = Preapical spine), 18-20. *Onoretilla merida*, 18. Lateral view, 19. Ventral view, 20. Penis valve, lateral view.



Figures 21-24 Ephuta types. 21-22. *E. consanguinea* holotype, 21. Habitus, dorsal view, 22. Labels. 23-24. *E. crassicornis* lectotype, 23. Habitus, dorsal view, 24. Labels.



Figures 25-26 *Ephuta crux* holotype. 25. *Habitus, dorsal view*, 26. *Labels*.



Figures 27-30 *Ephuta* holotypes. 27-28. *E. detracta*, 27. Habitus, dorsal view, 28. Labels. 29-30. *E. venatrix*, 29. Habitus, dorsal view, 30. Labels.



Figures 31-34 Ephuta holotypes. 31-32. *E. graciosa*, 31. Habitus, dorsal view, 32. Labels. 33-34. *E. discursa*, 33. Habitus, dorsal view, 34. Labels.

BIBLIOGRAPHY

- CAMBRA R. A., TUNES BUSCHINI M. L., QUINTERO ARIAS D., BROZOSKI F., RUDIAK LUSTOSA P. 2017. *Ephuta ice-ma* Casal, 1969 and its host *Auplopus subaurarius* Dreisbach, 1963 (Hymenoptera: Mutillidae, Pompilidae) from Brazil. *Zootaxa* 4272 (2): 285–290.
- CASAL O. H. 1968A. Aportaciones para el conocimiento de los Mutillidae de la Republica Argentina. II. Los Machos de Ephutini Ashmead (Hymenoptera). *Physis* 28 (76): 77-93.
- CASAL O. H. 1968B. Las Hembras de Ephutini de la Republica Argentina (Hymenoptera – Mutillidae). *Revista de la Sociedad Entomologica Argentina* 31 (1-4): 33-41.
- EVANS H.E., YOSHIMOTO C.M. 1962. The ecology and nesting behavior of the Pompilidae (Hymenoptera) of the Northeastern United States. *Miscellaneous Publications of the Entomological Society of America* 3: 66-119.
- KIMSEY L.S. 1980. Notes on the biology of some Panamanian Pompilidae, with a description of a communal nest (Hymenoptera). *The Pan Pacific Entomologist* 56 (2): 98-100.
- KROMBEIN K.V. & NORDEN, B.B. 1996. Behavior of nesting *Episyron conterminus posterus* (Fox) and its cleptoparasite *Ephuta s. slossonae* (Fox) (Hymenoptera: Pompilidae, Mutillidae). *Proceedings of the Entomological Society of Washington* 98(2): 188-194.
- LOYOLA R.D., MARTINS R.P. 2006. Trap-nest occupation by solitary wasps and bees (Hymenoptera: Aculeata) in a forest urban remnant. *Neotropical Entomology* 35 (1): 41-48.
- MICKEL C. E. 1952. The Mutillidae (wasps) of British Guiana. *Zoologica, New York Zoological Society* 37(3): 105-150.
- NONVEILLER G. 1990. Catalogue of the Mutillidae, Myrmosidae and Bradynobaenidae of the Neotropical region including Mexico (Insecta: Hymenoptera). The Netherlands, SPB Academic Publishing bv, 150 p.
- PAGLIANO G., CAMBRA R.A., QUINTERO ARIAS D. 2017. Nuovo genere e nuova specie di Ephutinae dell'Ecuador. *Bollettino del Museo regionale di Scienze naturali di Torino*, 33 (1-2): 197-202.
- QUINTERO D., CAMBRA R. A. 1996. Contribución a la sistemática de las mutílicas (Hymenoptera) del Perú, en especial las de la Estación Biológica BIOLAT, Rio Manu, Pakitza, p.327–357. In: D. E. Wilson and A. Sandoval(eds.) *Manu: The biodiversity of Southeastern Peru*. Washington DC, Smithsonian Institution Press, 679 p.
- SCHUSTER R. M. 1945. A key to the Central American, Mexican and West Indian species of *Ephuta* (Mutillidae), with descriptions of new species. *Revista de Entomología* 16 (1-2): 187–204.
- SCHUSTER R.M. 1951. A revision of the genus *Ephuta* (Mutillidae) in America North of Mexico. *Journal of the New York Entomological Society*, 59 (1): 1-43.
- SCHUSTER R. M. 1956. A Revision of the genus *Ephuta* (Mutillidae) in America North of Mexico. Part II. *Journal of the New York Entomological Society* 64: 7-84.
- SMITH F. 1855. Catalogue of Hymenopterous insects in the collection of the British Museum. Mutillidae and Pompilidae. London. Pt. III, pp. 1-63.
- SMITH F. 1879. Descriptions of new species of Hymenoptera in the collection of the British Museum. London, pp. 189-227.
- ZANETTE L.R.S., SOARES, L.A., PIMENTA, H.C., CONCÁLVEZ, A.M. & MARTINS, R.P. 2004. Nesting biology and sex ratios of *Auplopus militaris* (Lynch-Arribálzaga 1873) (Hymenoptera Pompilidae). *Tropical Zoology*, 17, 145-154.