



Scientific Note

New country records of the Metopiinae (Hymenoptera: Ichneumonidae) in the Neotropical region

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Abstract. The range distribution is expanded for 26 Metopiinae species: *Colpotrochia beluga* Gauld & Sithole, 2002 (Panama); *C. diabellula* Gauld & Sithole, 2002 (Venezuela); *C. feroza* Gauld & Sithole, 2002 and *C. texana* (Cresson, 1872) (Ecuador); *C. watanka* Gauld & Sithole, 2002 (Ecuador, French Guiana); *Cubus validus* (Cresson, 1865) (Peru); *Exochus ozanus* Gauld & Sithole, 2002 (Argentina); *E. spinalis* Townes & Townes, 1959 (Ecuador); *E. pubitus* Gauld & Sithole, 2002 (Guatemala); *E. krellus* Gauld & Sithole, 2002 (Mexico); *E. pedanticus* Gauld & Sithole, 2002; *E. xetus* Gauld & Sithole, 2002 and *E. yorizus* Gauld & Sithole, 2002 (Panama); *E. obezus* Gauld & Sithole, 2002 and *E. ravetus* Gauld & Sithole, 2002 (Peru); *E. vanitus* Gauld & Sithole, 2002 (Guatemala, Nicaragua, Panama); *E. voxanus* Gauld & Sithole, 2002 (Guatemala, Mexico, Panama); *E. navitus* Gauld & Sithole, 2002 (Ecuador, Honduras, Venezuela); *Trieces platysoma* Townes, 1946 (Suriname); *T. tyloidalis* Mazón & Bordera, 2016 (Bolivia); *T. wardae* Gauld & Sithole, 2002 (Ecuador); *T. zwizarmae* Gauld & Sithole, 2002 (Peru); *T. horisme* Gauld & Sithole, 2002 (Argentina, Belize, Mexico, Panama); *T. riodinis* Gauld & Sithole, 2002 (Curaçao, Ecuador, Mexico, Panama, Saint Vincent and The Grenadines); *T. tuvule* Gauld & Sithole, 2002 (Belize, Colombia, Ecuador, Mexico); and *T. wasnia* Gauld & Sithole, 2002 (Panama, Peru).

Keywords: Ichneumonoidea, *Colpotrochia*, *Cubus*, *Exochus*, *Trieces*.

Metopiinae is one of the most distinctive subfamilies of Ichneumonidae. They are characterized for having an evenly convex clypeus and face, which generally is produced into a point between the antennal sockets (Quicke 2015), pronotum laterally concave and posteriorly rounded, occluding the spiracular sclerite (Gauld & Sithole 2002), stout legs, and compact body shape (Broad et al. 2018). This characteristic morphology seems to be an adaptation that allows them to gain access to the host, as several species are parasitoids of leaf-rolling and web-inhabitants Lepidoptera (Broad et al. 2018). Metopiinae with known host associations are koinobiont larva-pupal endoparasitoids of Lepidoptera (Gauld & Sithole 2002).

The Neotropical Metopiinae has received limited attention; only the Costa Rican fauna has been thoroughly revised (Gauld & Sithole 2002) while the rest of the countries have very few records and do not reflect their real diversity and richness, in fact most of the species are solely known from this country. *Trieces* Townes, 1946 has received more attention than any other genera of Metopiinae in the Neotropics, new species have been recently described along with several new country records (Mazón & Bordera 2016, Melo et al. 2015, Tolkanitz 2009). Whilst, *Exochus* Gravenhorst, 1829 the largest genus of Metopiinae, in the Neotropics only three species are known from South America (Gauld & Sithole 2002, Melo et al. 2015).

The aim of the present note is to document the range extension of four genera of Metopiinae, *Colpotrochia* Holmgren, 1856, *Cubus* Townes, 1959, *Exochus*, and *Trieces*, in the Neotropics.

Studied specimens are deposited in the following institutions: Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada (CNC), Florida State Collection of Arthropods, Gainesville, Florida, USA (FSCA), Museo Entomológico Klaus Raven Büller, Lima, Peru (MEKRB), Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru (MUSM), Division of Entomology, University of Kansas Natural History Museum, Kansas, USA (SEMC), and Utah State University, Logan, USA (USUC). Specimens were

compared with the type series and identified individuals deposited in the Natural History Museum, London, United Kingdom (NHML) and the Museo Nacional de Costa Rica, Santo Domingo de Heredia, Costa Rica (MNCR). Curators of these institutions are mentioned in the Acknowledgement section.

New records of each species are marked with an asterisk. The studied material is organized by country and the major geographic regions (states, departments, district, commune or provinces, according to each country). Different collecting events are separated with semicolons; the label data was rearranged, including only the information provided, in the following order: locality, coordinates, elevation, date, collecting method, collector, and any other information included; abbreviations were completed; if other language than English was employed, it was translated; and, the collecting methods, if mentioned in the label, were abbreviated as follow: Malaise trap (MT), yellow pan trap (YPT), and flight intersection trap (FIT).

Microphotographs were prepared using a Canon 7D digital camera attached to an Infinity K-2 long-distance microscopic lens, assembled series of images at different focal depths with the Zerene Stacker™ software package in the laboratories of the SEMC.

Colpotrochia Holmgren, 1856

Colpotrochia beluga Gauld & Sithole, 2002 (Fig. 1B)

Distribution. Costa Rica (Gauld & Sithole 2002), Panama*.

Examined material. PANAMA: Colón: ♀, Canal Zone, Barro Colorado Island, 1–14.VIII.1994, FIT, D. Banks (CNC).

Colpotrochia diabellula Gauld & Sithole, 2002 (Fig. 1A)

Distribution. Costa Rica, Mexico (Gauld & Sithole 2002, Khalaim &

Ruiz-Cancino 2011), and Venezuela*.

Examined material. VENEZUELA: Aragua: ♀, ♂, Rancho Grande Biological Station, Portachuelo Pass, 10°21'0"N 67°41'0"W, 1100 m, 4.VI.1998, J. Ashe, R. Brooks, R. Hanley, VEN1ABH98 186 (SEMC).

Colpotrochia feroza Gauld & Sithole, 2002

Distribution. Costa Rica, Mexico (Gauld & Sithole 2002, Khalaim & Ruiz-Cancino 2011), and Ecuador*.

Examined material. MEXICO: Esmeraldas: ♀, Bilsa Biological Station, 0.34°N 79.71°W, 500m, 7–19.VII.1996, FIT, P.S. Hibbs (CNC). Sucumbíos: ♀, Napo River, Sacha Lodge, 0°30'S 76°30'W, 220–230m, 12–22.VI.1994, MT, P. Hibbs (CNC).

Colpotrochia texana (Cresson, 1872)

Distribution. Brazil, Costa Rica, USA (Gauld & Sithole 2002), Mexico (Khalaim & Ruiz-Cancino 2011), and Ecuador*.

Examined material. ECUADOR: Los Ríos: ♀, Santo Domingo de los Colorados, 47 Km S Palenque River, 200m, 22–31.vii.1976, S. & J. Peck (CNC).

Colpotrochia watanka Gauld & Sithole, 2002

Distribution. Costa Rica, Mexico (Gauld & Sithole 2002, Khalaim & Ruiz-Cancino 2011), Ecuador*, and French Guiana*.

Examined material. ECUADOR: Sucumbíos province: ♀, Napo River, Sacha Lodge, 0°30'S 76°30'W, 220–230m, 12–22.VI.1994, MT, P. Hibbs; ♀, idem but 13–23.IV.1994; ♀, idem but 24.III.1994; ♀, idem but 270m, 24.V–3.VI.1994, J. Peck (CNC). FRENCH GUIANA: ♀, Patawa Kaw Mountain, 4°33.562'N 52°12.425W, VIII.2007, MT, J. Cerdá (CNC).

Cubus Townes, 1959

Cubus validus (Cresson, 1865)

(Fig. 1C)

Distribution. Brazil, Colombia, Costa Rica, Cuba, Mexico (Gauld & Sithole 2002, Khalaim & Ruiz-Cancino 2011), and Peru*.

Examined material. PERU: Cuzco: ♀, Pagoreni, 11° 47'05.4"S 72°42'03"W, 465m, 23.IX.1998, MT, Camisea Project; 4♂, La Convención, Echarate, 11°51'51.3"S 72°46'57.6"W, 579m, VIII–IX.1998, J. Santiesteban & G. Valencia; ♀, La Convención, Echarate, Tunquio, 12°15'39.33"S 72°52'34.21"W, 1028m, 26.IX–01.X.2010, C. Carranza & S. Cavero (MUSM). Madre de Dios: ♂, Reserva Comunal Amarakaeri, 13°2'18.62"S 70°51'56.34"W, 726m, 07–09.X.2010, M. Vílchez"; ♀, idem but 12°58'57.51"S 70°1'40.93"W, 732m, 30.X–01.XI.2010; ♂, idem but creek Pinquiry, 12°55'30.49"S 70°51'34.23"W, 421m, 21–23.X.2010; 2♂, idem but Colorado River, 13°5'48.66"S 70°57'58.44"W, 926m, 02–04.XI.2010; ♂, Cupudnoe River, 12°46'56.04"S 70°57'26.00"W, 410m, 13–17.X.2010 (MUSM). Loreto: ♀, right bank of Huallaga river, near to Yurimaguas, 5°50'9.12"S 76°4'38.92"W, 130m, 3.IV.2018, L. Perez (MUSM).

Exochus Gravenhorst, 1829

Exochus krellus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Mexico*.

Examined material. MEXICO: Oaxaca: ♀, Km. 185.5 Tuxtepec-Oaxaca Road, 22.X.1962, 2200m, H. & M. Townes (USUC).

Exochus navitus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Ecuador*, Honduras*, and Venezuela*.

Examined material. ECUADOR: Napo: ♀, Baeza, 2000m, II.1979, Mason (USUC). Pichincha: ♀, above Tandapi, 8.II.1983, 2300m, Masner & Sharkey; ♂, Tandipi, 1500m, 8.II.1983, Lars Huggers; ♂, Palenque, II.1983, MT, M. Sharkey (USUC). HONDURAS: El Paraíso: 2♀♀, 7km SW Yucatán, cerro Monserrat, 1800m, 08.VI.1994, MT, H. & A. Howden (CNC); ♀, ♂, Cerro Monserrat, 1800, 30.V.1994, H. & A. Howden (USUC). Francisco Morazán: ♀, 30 km E Tegucigalpa, Cerro Uyuca, 1800m, 10.VI.1994, H. & A. Howden (USUC). VENEZUELA: Lara: ♀,

Yacambú, 1200m, 7.V.1981, H. K. Townes. Mérida: 2♀♀, 3♂♂, Tabay, La Mucuy, 1900m, 18.VI–2.VII.1989, MT, S. & J. Peck (USUC).

Exochus obezus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Peru*.

Examined material. PERU: Cuzco: ♀, San Pedro, 20.IX.2007, 1500m, 13°02'58"S 71°32'13"W, MT, C. Castillo (MUSM).

Exochus ozanus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Argentina*.

Examined material. ARGENTINA: Salta: ♀, Jakulica, 40 km. W Aguas Blancas, VII–IX.1970, C. Porter (FSCA). Tucumán: ♀, Horco Molle, XII.1968, C. C. Porter (CNC).

Exochus pedanticus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Panama*.

Examined material. PANAMA: Chiriquí: ♀, 5–6km N Boquete, la culebra trail, 1650m, 15–19.VI.1996, FIT, J. Ashe & R. Brooks, #187 (CNC).

Exochus pubitus Gauld & Sithole, 2002

Distribution. Costa Rica, Mexico, Nicaragua (Gauld & Sithole 2002), and Guatemala*.

Examined material. GUATEMALA: Guatemala: ♀, San Cristobal, 1350m, II.1966, Welling (CNC).

Exochus ravetus Gauld & Sithole, 2002

(Fig. D)

Distribution. Costa Rica (Gauld & Sithole 2002), Peru*.

Examined material. PERU: Cuzco: ♀, Cosñipata valley, San Pedro, 13°03'22"S 71°32'55"W, 1520m, 25.VIII–22.IX.2007, C. Castillo; ♀, idem but 24.X.2007; ♀, idem but 07.I.2008 (MUSM); ♀, La Convención, Quillabamba, Poromate, 1600m, 10.X.2007, A. Rodríguez (MEKRB).

Exochus spinalis Townes & Townes, 1959

Distribution. Costa Rica, Guatemala, Mexico, Nicaragua, USA (Gauld & Sithole 2002), and Ecuador*.

Examined material. ECUADOR: Pichincha: ♂, 10 km. N. Guayllabamba, 26.II.1983, Masner & Sharkey (USUC).

Exochus vanitus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Guatemala*, Nicaragua*, and Panama*.

Examined material. GUATEMALA: Escuintla: ♀, 1 mi. N. Palin, 3.XII.1972, B. & C. Dash (USUC). NICARAGUA: Carazo: ♀, Diriamba, 9.I.1973, B. & C. Dash; ♀, 2 mi. W. Jimotope, 8.I.1973, B. & C. Dash (USUC). PANAMA: Chiriquí: ♀, near Hato del Volcán, 4700ft, VII.1982, B. Gill (USUC).

Exochus voxanus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Guatemala*, Mexico*, and Panama*.

Examined material. GUATEMALA: Zacapa: ♀, San Lorenzo, 2200m, XI.1986, M. Sharkey (USUC). MEXICO: Chiapas: ♀, San Cristobal de las Casas, 7200ft, 27.V.1969; B.V. Petersen (USUC). PANAMA: Chiriquí: 7♀♀, 2 km W Cerro Punta, 1700m, 19.V–8.VI.1977, Peck & Howden (USUC).

Exochus xetus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Panama*.

Examined material. PANAMA: Chiriquí: 3♀♀, 2 km. W. Cerro Punta, 1700m, 19.V–8.VI.1977, Peck & Howden (CNC).

Exochus yorizus Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Panama*.

Examined material. PANAMA: Chiriquí: ♀, Finca La Suiza, 1300m, 28–30.V.2000, YPT along the trail, B. & J. Gill; ♀, idem but 25.V–5.

VI.2000 (CNC).

Trieces Townes, 1946

Trieces horisme Gauld & Sithole, 2002

(Fig. E)

Distribution. Brazil, Costa Rica, Ecuador, Peru, Venezuela (Gauld & Sithole 2002, Mazón & Bordera 2016), Argentina*, Belize*, Mexico*, and Panama*.

Examined material. ARGENTINA: Buenos Aires: 2♀♀, Buenos Aires, 1971, M.A. Fritz (USUC). Tucumán: ♀, Horco Molle, XII.1968, C.C. Porter (CNC); ♀, Horco Molle, 8–14. V.1966, Lionel Stange (USUC). BELIZE: Stann Creek: 2♀♀, Middlesex, 125m, 27.IV.1965 E.C. Welling; ♀, idem but 1.V.1965; ♂, idem but 25.III.1965 (CNC). ECUADOR: Pichincha: ♀, ♂, Tinalandia, VII.1983, M. Sharkey (USUC). Santo Domingo de los Tsáchilas: 3♂♂, Los Ríos, Santo Domingo de los Colorados, 47 Km S

Palenque River, 200m, 18–30.VI.1975, S. & J. Peck (CNC); ♂, Santo Domingo, 215m, 17–30.V.1975, S. & J. Peck (USUC). **MEXICO:** Chiapas: ♀, Muste, near Huixtla, 440m, 21.IX.1970, MT, Welling (CNC). Oaxaca: ♂, Metate, 85.5 km. SW of Tuxtepec, 18.X.62, 900m, H. & M. Townes (USUC). San Luis Potosí: ♀, ♂, San Luis Potosí - Hidalgo highway 85 (km 246–252), 800m, 10.VII.1990, I. Yarom (SEMC). **PANAMA:** Panama: ♀, Las Cumbres, 23.XII.1981, H. Wolda (USUC). **VENEZUELA:** Aragua: ♀, Maracay, Pozo del Diablo, 11.I.1996, MT, M. Sharkey (CNC).

Trieces platysoma Townes, 1946

Distribution. Costa Rica, Mexico (Gauld & Sithole 2002), Brazil, Peru (Mazón & Bordera 2016), and Suriname*.

Examined material. SURINAME: Marowijne: 2♀♀, Perica, 70 Km E Paramaribo on East-West road, 5m, 5°40'28"N 54°36'31"W, 29–31.V.1999, FIT, Z.H. Falin & B. Dedijn (CNC).

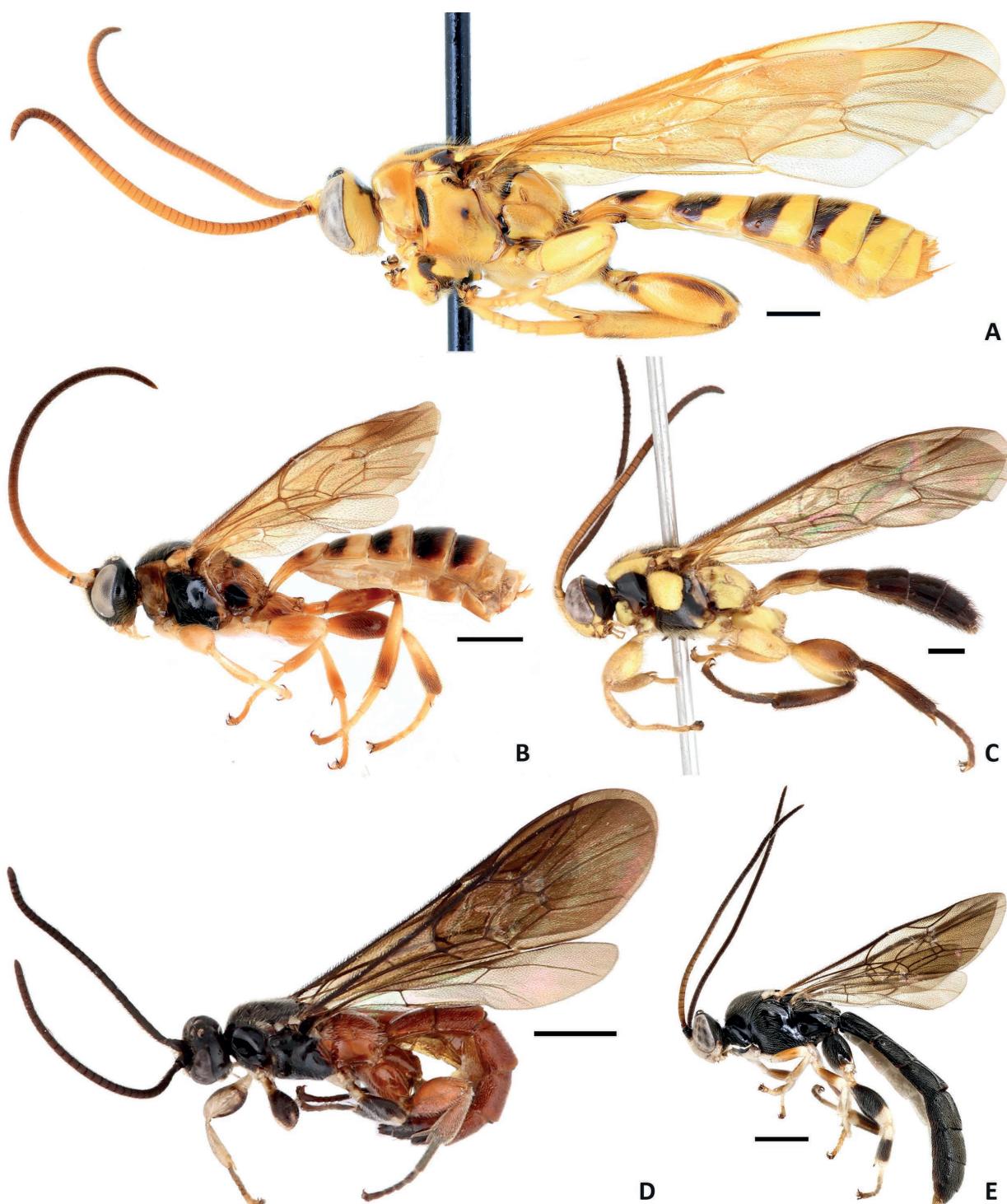


Figure 1 A–E. Habitus of various Metopiinae. A. *Colpotrochia diabella* Gauld & Sithole, 2002 (female) B. *Colpotrochia beluga* Gauld & Sithole, 2002 (female) C. *Cubus validus* (Cresson, 1865) (male) D. *Exochus ravetus* Gauld & Sithole, 2002 (female) E. *Trieces horisme* Gauld & Sithole, 2002 (male) (scale bar=1mm).

Trieces riordinis Gauld & Sithole, 2002

Distribution. Belize, Brazil, Venezuela (Mazón & Bordera 2016), Costa Rica (Gauld & Sithole 2002), Peru (Tolkanitz 2009), Curaçao*, Ecuador*, Mexico*, Panama*, Saint Vincent and The Grenadines*.

Examined material. CURAÇAO: 2♀, Christoffel National Park, 150m, 5–17.XII.2007, YPT, L. Masner, ex: Forest (CNC). ECUADOR: Napo: ♀, Tena, II.1983, 400m, Sharkey (USUC). Pichincha: 5♀♀, ♂, Tinalandia, 800m, II.1983, MT, M. Sharkey (USUC); ♀, idem but V.1983; 2♀♀, ♂, idem but 8.II.1983, Masner (USUC); 2♀♀, idem but 2.II.1983, Masner & Sharkey (USUC); ♀, Palenque, II.1983, MT, M. Sharkey (USUC); ♀, Palenque River, 21–25.II.1979, MT (CNC); 3♀♀, 16 km SE Santo Domingo Tinalandia, 500m, 4–14.VI.1976, S. & J. Peck (CNC); 2♀♀, ♂, idem but 680m, 15–30.VI.1975 (CNC); ♂, Quito/S. Domingo, 600/1000m, 3.I.1971, Luis E. Pena (USUC). MEXICO: Hidalgo: ♂ Tlanchinol, 13.VI.1983, M. Kaulbars (USUC). Veracruz de Ignacio de la Llave: 2♀♀, 33km. NE Catemaco, 160m, VII.1983, S. & J. Peck (USUC). Chiapas State: ♀, San Cristóbal de las Casas, 7200ft, 10.VI.1969, W.R.M. Mason (CNC). Oaxaca: 2♀♀, Comaltepec, La Esperanza, 17.62661°N 96.36956°W, 1300m, 1–6.X.2008, A. Lopez Garcia, MT, edge of montane cloud forest (CNC). Sinaloa: ♀, 15 mi. W. El Palmito, 5000ft, 12.VII.1964, W.R.M. Mason (CNC). PANAMA: Colón: ♀, Barro Colorado Island, Gatun Lake, 3.IX.1982, H. Wolda (USUC); ♂, idem but 2.IX.1982 (USUC). SAINT VINCENT AND THE GRENADINES: Saint Vincent: 10♀♀, Montreal, Majorca, MT, Summer 1972 (CNC).

Trieces tuvule Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002), Peru (Mazón & Bordera 2016), Belize*, Colombia*, Ecuador*, and Mexico*.

Examined material. BELIZE: Stann Creek: ♀, Middlesex, 125m. 27.IV.1965, E.C. Welling (CNC). COLOMBIA: Valle del Cauca: ♀, Anchicaya Dam, 10 km E Buenaventura, 1200ft, 18–20.II.1970, H.F. Howden (USUC). ECUADOR: Pichincha: ♀, 47km S. Santo Domingo, Palenque River, 1–14.VIII.1975, A. Forsyth (CNC). MEXICO: Nuevo León: ♂, Linares, 3.VI.1983, M. Kaulbars (USUC).

Trieces tyloidalis Mazón & Bordera, 2016

Distribution. Brazil (Mazón & Bordera 2016), Bolivia*.

Examined material. BOLIVIA: Beni: ♂, Beni Biological Station, Palm Camp, Savannah 1 VIII.1988, BIOLAT-SI/MAB ex., MT, Robert W. Brooks (SEMC).

Trieces wardae Gauld & Sithole, 2002

Distribution. Brazil (Melo et al. 2015), Costa Rica (Gauld & Sithole 2002), and Ecuador*.

Examined material. ECUADOR: Sucumbíos: ♀, Napo River, Sacha Lodge, 0.5°S 76.5°W, 290m, 22.XI–1.XII.1994, Hibbs (USUC).

Trieces wasnia Gauld & Sithole, 2002

Distribution. Brazil (Melo et al. 2015), Costa Rica (Gauld & Sithole 2002), Panama* and Peru*.

Examined material. PANAMA: Colón: ♀, Barro Colorado Island, Gatun Lake, 20.X.1982, H. Wolda (USUC). PERU: Madre de Dios: ♀, Tambopata, Explorer's Inn, 12°50'30"S 69° 17'31.1"W, 161m, 19.VII.2009, M. Alvarado (MUSM); ♀, idem but 12°50'44.2"S 69°17'34.5"W, 189m, 1–14.XII.2008, MT, L. Sulca & M. Alvarado (MUSM); ♀, CICRA, 12°34'3.1"S 70°5'46.7"W, 280m, 23–27.III.2006, MT, C. Castillo (MUSM); ♀, Reserva Comunal Amarakaeri, 12°56'31.97"S 70°48'23.04"W, 333m, 24–26.IX.2010, M. Vilchez & C. Castillo (MUSM).

Trieces zwizarmae Gauld & Sithole, 2002

Distribution. Costa Rica (Gauld & Sithole 2002) and Peru*.

Examined material. PERU: Huánuco: ♀, Tingo María, 27.I.1984, L. Huggert (USUC).

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Author's Contributions

MA identified the specimens, MA and LF wrote the manuscript.

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