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TRABAJOS ORIGINALES

Beetles of Peru: a survey of the Families. Eucnemidae Eschscholtz, 1829

Los escarabajos del Perú: un estudio de las Familias. Eucnemidae Eschscholtz, 1829

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Abstract

A checklist of the eucnemid beetles of Peru is presented, based on a literature survey and identification of specimens from two museums. The Peruvian fauna comprises ~107 species in 30 genera from eight tribes and three subfamilies. Nine genera are newly recorded for Peru. They include: *Xylophilus* Mannerheim 1823, *Temnillus* Bonvouloir 1871, *Gastraulacus* Guérin-Méneville 1843, *Somahenecus* Cobos 1964, *Silveriola* Cobos 1956, *Onichodon* Newman 1838, *Cladus* Bonvouloir 1872, *Thambus* Bonvouloir 1871 and *Neomathion* Fleutiaux 1930. Fifty-eight species are newly recorded for Peru. A familial diagnosis as well as notes on eucnemid habitat, collecting methods, and biology are provided. This contribution is part of the 'Beetles of Peru' project.

Keywords: False click beetles; biodiversity; Neotropical; South America; checklist.

Resumen

Se presenta una lista anotada de los escarabajos eucnemídeos del Perú, basada en registros bibliográficos y examen de especímenes en colecciones de dos museos. La fauna peruana consiste aproximadamente de 107 especies en 30 géneros de ocho tribus y tres subfamilias. Se registran nueve géneros para Perú; entre ellos se encuentran: *Xylophilus* Mannerheim 1823, *Temnillus* Bonvouloir 1871, *Gastraulacus* Guérin-Méneville 1843, *Somahenecus* Cobos 1964, *Silveriola* Cobos 1956, *Onichodon* Newman 1838, *Cladus* Bonvouloir 1872, *Thambus* Bonvouloir 1871 y *Neomathion* Fleutiaux 1930. Recientemente se registraron cincuenta y ocho especies para Perú. Se proporciona una diagnosis de la familia, así como también notas sobre hábitat, métodos de recolección y biología de Eucnemidae. Esta publicación es una contribución del proyecto 'Escarabajos del Perú'.

Palabras claves: Falsos escarabajos click; biodiversidad; Neotropical; Sudamerica; Lista sistemática.

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Introduction

Eucnemidae is globally distributed, found on all continents except for Antarctica, and is comprised of 1900 species in 200 genera (Blackwelder 1944, Muona 1987, 1993, 2000 & 2010, Otto 2016, Vahtera et al. 2015). Eucnemidae is most diverse in the subtropical and tropical regions of the world, with representations in the temperate and boreal regions. The term "False-Click Beetles" has been used to distinguish the family from the true click beetles on a belief these beetles are unable to click (Muona 2000). However, many species have the ability to click and in doing so produce a series of audible sounds, forming a defensive strategy to startle any would-be predators (Muona 1993). The common name is still in use, but Eucnemidae is distinguished from Elateridae by the subterminal attachment of the pedicel to the scape of the antenna (terminal in Elateridae). Association with fungus present in dead wood and trees within forest ecosystem is an important factor in the family's role in forest regeneration, especially in tropical regions (Muona 2000; Otto 2016). Species of Eucnemidae are also good indicators of diverse forest structures (Muona 2000). I report here on the eucnemid fauna of Peru, as part of Caroline Chaboo's 'Beetles of Peru' project (see Chaboo 2015).

Characterization of Eucnemidae: Length 1.5 – 40.0 mm; body moderately elongate to very elongate; vestiture of recumbent setae often present, usually unicolored, sometimes bicolored; flat, scale-like setae present in some; color uniformly light brown to black, sometimes bicolored or metallic; head deeply inserted into prothorax, somewhat hidden above, strongly transverse, somewhat declined; antennae inserted in front above frontolclypeal region; antennae 11-segmented (rarely 12-segmented), variable in length; scape elongate, inflated; pedicel small, globular, subterminally attached to scape; antennomeres moniliform, capitate, clavate, serriform, filiform, pectinate, bipectinate, biserrate or flabellate; mandibles either stout, with a basal ventral tooth or slender, without teeth; eyes small or large, incised in some groups; pronotum quadrate, longer than wide or wider than long; widest in middle, often parallel-sided or arcuate laterally; disc convex, usually with impressions or gibbosities; lateral pronotal ridge present, usually simple and well developed or serrate and divided; hind angles variably developed; hypomera without antennal grooves, with notosternal antennal grooves, or with lateral antennal grooves; lateral antennal grooves either shallow or deep, wide or narrow, basally opened or basally closed; prothoracic sternal spine either poorly developed, low or high and truncate; elytral striae absent to well developed; interstices usually elevated; metathoracic coxal plates either wider mediad, parallel-sided or wider laterad; male prothoracic tarsomere I with or without sex combs; male sex combs either basal and straight, basal and curved, encompassing the entire length or apical; lateral surfaces of mesothoracic and metathoracic tibiae either with setae only, setae and transverse rows of spine combs or setae and irregularly placed spines; tarsomere IV either simple or excavate-emarginate; pretarsal claws either serrate, simple or basally toothed; last visible ventrite apically rounded, strongly produced, truncated or bispinose; male aedeagus extremely variable, trilobate; female genital tract variable (Muona 1993 & 2010; Otto 2016).

Distribution and habitats: Eucnemids occur largely in woodlands and forests, especially with a diverse forest structure and an abundance of dead wood for breeding. Adults are typically found in the tree canopies and on/under tree bark. Many species are nocturnally active and some may be attracted to artificial lights. Adults of some species are diurnally active, especially deep within the forest system. Little is known about food preferences, if any, of adults. Adults are strong fliers and capable of traveling great distances. Some flightless species are also known, especially those isolated and confined to islands.

Known larvae burrow in moist dead wood, hard seasoned wood or thrive in the soil near the roots of dead/dying trees. Fungi are usually present where larvae have been found in those situations. Larvae in these settings may be feeding on fungal mycelia or hyphae present in the surrounding wood. Some believe larvae have a liquid diet, where extra-oral digestion may take place when larvae re-ingest digestive juices after breaking down hyphae from the wood.

Collecting Eucnemidae: Many specimens from previous surveys in Peru have been taken largely from flight intercept traps, especially Malaise traps. Some specimens were taken in canopy Malaise traps. Specimens of Eucnemidae can also be taken by examining surfaces of tree, especially beneath the bark. As alluded to above, another technique used for collecting eucnemids includes the use of light traps. Lengthy series of eucnemids, including larval types can also be reared (e.g., Otto 2015; Otto & Gruber 2016). That technique is also useful in obtaining biological information to expand the current, often scant information in literature.

Methods

Checklist: Data presented were derived from several sources. Some are from Blackwelder (1944) and Vahtera et al. (2015). Vahtera et al. (2015) added 39 new, undescribed species to the Peruvian fauna, which were collected in the Loreto Region from two distinct forest systems. These 39 undescribed species are currently part of the Neotropical Eucnemidae revision led by Jyrki Muona, in which he will be describing and naming these species. These species are listed herein as 'n. sp.' The specimens studied from two museums have not been compared against any of the Vahtera et al. (2015) material. Those species are listed as 'species a, b, c or aa, etc..' as a means to distinguish these 'species' apart from both studies. Specimens identified to "near" species are listed, along with an explanation as to how it differs from that named species. All others identified to species have been identified based on translated, interpreted information along with comparison against some authoritatively identified specimens in the GERP collection as noted for each identified species.

A portion of the new data are reported from specimens maintained in the Global Eucnemid Research Project (GERP) at University of Wisconsin – Madison, U.S.A. Other specimens studied came from the Snow Entomology Museum (SEMC) at University of Kansas, U.S.A which includes specimens collected most recently by Caroline Chaboo, under Peru research permits No. 506-2011-AG-DGFFS-DGEFFS and No. 0159-2010-AG-DGFFS-DGEFFS. The final repository for part of the SEMC material collected by the Chaboo team will be the Museo de Historia Natural, Lima, Peru (MUSM) collection. Five specimens of four species from the Carnegie Museum of Natural History (CNHM) of Philadelphia, Pennsylvania, U.S.A. are also included herein.

Label data for newly recorded taxa in Peru are presented verbatim, with text for each individual label placed inside quotation marks and separated from an underlying label by a slash (/). Observed metadata for some labels are placed inside brackets. Each specimen deposited in the collection of the Global Eucnemid Research Project (GERP) bears a green framed white label, "Collection of the Global Eucnemid Research Project, (Robert L. Otto)". Finally, type localities are listed below for eucnemid species originally described in Peru.

Results

The checklist below indicates the eucnemid diversity in Peru as comprising three subfamilies, eight tribes, 30 genera, and ~107 species.

Checklist of Eucnemidae of Peru

Melasinae Fleming, 1821
Xylobiini Reitter, 1911
Xylophilus Mannerheim, 1823

1. Xylophilus othoides Fleutiaux, 1899

Distribution: South America – Brazil, Peru, Venezuela.

Material examined: One specimen was available for study: "PERU: Pasco Dept., Villa Rica Rd., 1475 m, 10°47'6"S, 75°18'54"W, 15–18 Oct 1999; R. Brooks, D. Brzoska, PERU1B99 030C, ex: flight intercept trap" (SEMC).

Note: A second genus, *Paraxylophilus* Cobos 1964 is also distributed in the Neotropical region, with a single species, *Paraxylophilus minutus* described from Brazil. Cobos (1964) suggested *Xylophilus othoides* Fleutiaux 1899 may belong in that group. Identification of the species was made possible through translating and interpreting information from Fleutiaux (1899b) and further confirmed by an illustration in Teixeira and Casari-Chen (1994). I have not been able to examine the type for this species and ascertain whether the species belong in *Xylophilus* or should be transferred to *Paraxylophilus*.

Dirhagini Reitter, 1911
Entomophthalmus Bonvouloir, 1871

2. Entomophthalmus americanus Bonvouloir, 1871

Distribution: Central America – Belize, Costa Rica, Guatemala, Honduras, Nicaragua, Panama; South America – Brazil, Columbia, Ecuador, French Guiana, Guyana, Peru (Loreto Region).

3. Entomophthalmus brevicollis Bonvouloir, 1871

Distribution: Central America – Guatemala, Honduras; South America-Brazil, French Guiana, Peru

Material examined: One specimen was available for study: "PERU: Tambopata Prov., Madre de Dios Dpto., 15km NE Puerto" / "Maldonado, Reserva, Cuzco Amazonico, 12°33'S, 69°03'W, 200m, Plot #Z1E16" / "20 June 1989, J.S. Ashe, R.A. Leschen #173, ex., flight intercept trap" (SEMC).

Note: Identification of the specimen was based on translated identification key provided by Bonvouloir (1871).

4. Entomophthalmus germaini Fleutiaux, 1934

Distribution: Central America – Honduras, Panama; South America – Bolivia, Brazil, Ecuador, Peru.

Material examined: One specimen was available for study: "PERU: Tambopata Prov., Madre de Dios Dpto., 15km NE Puerto" / "Maldonado, Reserva, Cuzco Amazonico, 12°33'S, 69°03'W, 200m, Plot #Z2E17" / "28 June 1989, D. Silva, R.A. Leschen #314, ex., flight intercept trap" (SEMC).

Note: Identification of the species was made possible through translating and interpreting information from Fleutiaux (1934).

5. Entomophthalmus interruptus Bonvouloir, 1871

Distribution: Central America – Honduras, Nicaragua; North America – Mexico; South America – Brazil, Ecuador, Peru .

Material examined: Four specimens were available for study: 1, "PERU: Dept. Loreto, 1.5 km N Teniente Lopez, 2°35.66'S, 76°06.92'W, 22 July 1993, 210–240 m, Richard Leschen #164, ex: flight intercept trap" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 25.X–1.XI.2010, M.J. Endara, malaise trap, PER10-10-MAT-021" (SEMC); 2, "Peru: Madre de Dios Dept., CICRA Field Station. trail 6 research, plot, 12.55207°S 70.10962°W 295m, 7–9.VI.2011, Chaboo team, canopy Malaise, trap, PER-11-MAT-019" (SEMC).

Note: Identification of these specimens are based on translated identification key provided by Bonvouloir (1871).

6. Entomophthalmus n. sp.

Distribution: Peru (Loreto Region).

7. Entomophthalmus sp. a

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Cusco Dept., Villa Carmen, Fld Stn, cafeteria ~1.7 km west, research transect, 12.89250°S, 71.41917°W, 555m, 22–24.V.2011, DJ Bennett & E. Razuri, flight, intercept trap, PER-11-FIT-009" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

8. Entomophthalmus sp. b

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios Dept., CICRA Field Station. trail 6, research, plot, 12.55207°S 70.10962°W 295m, 7 – 9.VI.2011, Chaboo team, Malaise, trap, PER-11-MAT-024" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

Rhagomicrus Fleutiaux, 1902

9. Rhagomicrus interpositus Bonvouloir, 1872

Distribution: South America – Bolivia, Brazil, Colombia, French Guiana, Peru.

Material examined: One specimen was available for study: "PERU: Dept. Loreto, Campamento San Jacinto, 2°18.75'S, 75°51.77'W, 5 July 1993, 175–215 m, Richard Leschen, #33, ex: flight intercept trap" (GERP).

Note: Identification was made possible through comparison of a single specimen against an authoratively identified specimen in GERP provided by Jacques Chassain.

10. Rhagomicrus quirsfeldi Cobos, 1964

Distribution: Central America – Panama; South America – Brazil, Peru.

Material examined: One specimen was available for study: "PERU: Tambopata Prov., Madre de Dios Dpto., 15km NE Puerto" / "Maldonado, Reserva, Cuzco Amazonico, 12°33'S, 69°03'W, 200m, #Z2E16" / "24 June 1989, J.S. Ashe, R.A. Leschen #244, ex., flight intercept trap" (SEMC).

Note: Identification of a specimen was based on interpreting translated information provided by Cobos (1964).

11. Rhagomicrus n. sp.

Distribution: Peru (Loreto Region).

12. Rhagomicrus sp.

Distribution: Peru

Material examined: Two specimens were available for study: 1, "Peru: Madre de Dios Dept., CICRA Field Station. trail 6 research, plot, 12.55207°S 70.10962°W 295m, 7–9.VI.2011, Chaboo team, Malaise, trap, PER-11-MAT-019" (SEMC); 1, "Peru: Madre de Dios Dept., CICRA Fld Stn. trail 6, research, plot, 12.55207°S 70.10962°W, 295m 9–11.VI.2011, Chaboo team, flight intercept trap, PER-11-FIT-018" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

Adelothyreus Chevrolat, 1867

13. Adelothyreus n. sp.

Distribution: Peru (Loreto Region).

Adelorhagus Horn, 1890

14. Adelorhagus n. sp.

Distribution: Peru (Loreto Region).

Microrhagus Dejean, 1833

15. Microrhagus antennalis Fleutiaux, 1899

Distribution: South America-Bolivia, Peru.

Material examined: One specimen was available for study: "Peru, near Iquitos, 06-III-1997, colld by R.J. Buss" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / *Microrhagus*, *antennalis* Fleutiaux, Det. R.L. Otto, 2012" (GERP).

Note: Identification of the specimen was based on interpreting translated information provided by Fleutiaux (1899a). Type for the species were not examined during the study.

16. Microrhagus fragilis Bonvouloir, 1872

Distribution: South America – Bolivia, Ecuador, Guyana, Peru, Suriname, Venezuela.

Material examined: Seven specimens were available for study: 1, "PERU: Dept. Cusco:, Cock of the Rock Lodge, NE Paucartambo 13°03.3'S, 71°32.7'W, 1120m, 4–9-XI-2007 D. Brzoska. ex. flight intercept trap, PER1B07 001" (GERP); 1, "PERU: Dept. Loreto, Teniente Lopez, 2°35.66'S, 76°06.92'W, 24 July 1993, 210–240 m, Richard Leschen, #193, ex: flight intercept trap" (GERP); 1, "Peru: Madre de Dios, Tambopata Wildlife Res, 30 km SW Pto. Maldonado, 12°50'S, 69°20'W, 290m, 6-XII-1982, Joseph J. Anderson Coll." (CNHM); 2, "PERU: Madre de Dios, Cocha Cashu Bio. Stn., Manu National Park, 350 m. 11°53'45"S, 71°24'24"W, 17–19 Oct 2000; R. Brooks, PERU1B00 042, ex: flight intercept trap" (SEMC); 2, "PERU: Ucayali Dept., Tingo Maria-Pucallpa Rd., Puente Chino, km 205, 1300 m, 9°8'12"S, 75°47'20"W, 11–14 Oct 1999; R. Brooks, PERU1B99 007A, ex: flight intercept trap" (SEMC).

Note: Identification of these specimens were based on interpreting translated information provided by Bonvouloir (1872). Type for the species were not examined during the study.

17. Microrhagus neglectus Bonvouloir, 1872

Distribution: South America – Brazil, French Guiana, Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios Dept., CICRA Fld Stn. trail 6 research, plot, 12.55207°S 70.10962°W, 295m 11–13.VI.2011, Chaboo, team, canopy Malaise, bottom, sample, PER-11-CMB-002" (SEMC).

Note: Identification of the specimen was based on interpreting translated information provided by Bonvouloir (1872). Type for the species were not examined during the study.

18. Microrhagus striatus Fleutiaux, 1934

Distribution: South America – Brazil, Peru.

Material examined: One specimen was available for study: "PERU: Dept. Cusco, Kosñipata Vy., San Pedro, 11–15-XI-2009, J. Heppner, C. Carrera, E. Huamani" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / "*Microrhagus*, *striatus*, (Fleutiaux), Det. R.L. Otto, 2015" (GERP).

Note: Identification of the specimen was based on interpret-

ing translated information provided by Fleutiaux (1934). Type for the species were not examined during the study. Coordinates for San Pedro is 14.187073°S, 71.343098°W.

19. Microrhagus striolatus Bonvouloir, 1872

Distribution: South America – Brazil, Peru.

Material examined: One specimen was available for study: "PERU: San Martin, Escalera Lodge, Tarapoto, 9–12-X-2012, J.B. Heppner 435m" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / "*Microrhagus*, *striolatus*, Bonvouloir, Det. R.L. Otto, 2015" (GERP).

Note: Identification of the specimen was based on interpreting translated information provided by Bonvouloir (1872). Type for the species were not examined during the study. Coordinates for the collection site is: 6.46926°S, 76.3538°W.

20. Microrhagus n. sp. 1

Distribution: Peru (Loreto Region).

21. Microrhagus n. sp. 2

Distribution: Peru (Loreto Region).

22. Microrhagus n. sp. 3

Distribution: Peru (Loreto Region).

23. Microrhagus n. sp. 4

Distribution: Peru (Loreto Region).

24. Microrhagus n. sp. 5

Distribution: Peru (Loreto Region).

25. Microrhagus n. sp. 6

Distribution: Peru (Loreto Region).

26. Microrhagus n. sp. 7

Distribution: Peru (Loreto Region).

27. Microrhagus sp. b

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Ucayali Dept., Tingo Maria-Pucallpa Rd., Puente Chino, km 205, 1300 m, 9°8'12"S, 75°47'20"W, 11–14 Oct 1999; R. Brooks, PERU1B99 007A, ex: flight intercept trap" (GERP).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

28. Microrhagus sp. c

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios Dept., CICRA Field Stn. trl 6, research, plot, 12.55207°S 70.10962°W, 295m 11–13.VI.2011, Chaboo team, Malaise trap, PER-11-MAT-029" / "EUCNEMIDAE, det. M. Gimmel 2012" ["Eucnemidae" handwritten] (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

Weyrauchiella Cobos, 1972

29. Weyrauchiella peruviana Cobos, 1972

Distribution: Peru (Huanuco Region).

Type locality: Tingo Maria, Rio Huallaga, 700m alt., W. Weyrauch coll., 1-IV-1940 (Cobos 1972).

Eucneminae Eschscholtz, 1829
Dyscharachthini Muona, 1993
Dyscharachthis Blackburn, 1900

30. Dyscharachthis n. sp.

Distribution: Peru (Loreto Region).

31. Dyscharachthis sp. b

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Dept. Cusco:, Cock of the Rock Lodge, NE Paucartambo 13°03.3'S, 71°32.7'W, 1120m, 4–9-XI-2007 D. Brzoska. ex. flight intercept trap, PER1B07 001" (SEMC).

Note: The specimen certainly belongs to *Dyscharachthis*. The specimen has not been compared against any types for species currently placed in *Idiotarsus* for proper specific identification.

32. Dyscharachthis sp. c

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios, Tambopata Wildlife Res, 30 km SW Pto. Maldonado, 12°50'S, 69°20'W, 290m, 22–25-XI-1982, Joseph J. Anderson Coll." (CNHM).

Note: The specimen certainly belongs to *Dyscharachthis*. The specimen has not been compared against any types for species currently placed in *Idiotarsus* for proper specific identification.

Mesogenini Muona, 1993
Temnillus Bonvouloir, 1871

33. Temnillus sp.

Distribution: South America-Bolivia, Brazil, Colombia, French Guiana, Peru.

Material examined: One specimen was available for study:

"PERU: Tambopata Prov., Madre de Dios Dpto., 15km NE Puerto" / "Maldonado, Reserva, Cuzco Amazonico, 12°33'S, 69°03'W, 200m, Plot #Z1E7" / "9 July 1989, J.S. Ashe, R.A. Leschen #449, ex., under bark" (SEMC).

Note: Muona (pers. com.), currently revising the group, suggested a complex of species exist in South America from which the Peruvian species is different from specimens taken in French Guiana and could possibly be a new species. The specimen has not been compared against any types of other species within the group.

Eucnemini Eschscholtz, 1829
Gastraulacus Guérin-Méneville, 1843

34. Gastraulacus nevermanni Barber, 1925

Distribution: Central America – Costa Rica; South America – French Guiana, Peru.

Material examined: Two specimens were available for study: 1, "PERU: SATIPO, JUNIN, RIO TAMBO, iv 2012" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / "*Gastraulacus*, *nevermani*, Barber, Det. R.L. Otto, 2014" (GERP); 1, "PERU: Ucayali Dept., Tingo Maria-Pucallpa Rd., Puente Chino, km 205, 1300 m, 9°8'12"S, 75°47'20"W, 11–14 Oct 1999; R. Brooks, PERU1B99 007A, ex: flight intercept trap" (SEMC).

Note: Identifications were facilitated through comparisons of these two specimens against an illustration of the species in Chassain and Touroult (2011). Approximate coordinates for Satipo, Junin, Rio Tambo is 12.1°S, 73.8667°W.

Poecilochrus Bonvouloir, 1871

35. Poecilochrus quadriimpressus Bonvouloir, 1875

Distribution: Peru (Pasco Region).

Type locality: Pozuzo.

Note: Without seeing the type, it is suspected the species is misplaced in the group, *Poecilochrus* is largely distributed in Southeast Asia. The Peruvian specimens could belong to either *Idiotarsus* Bonvouloir, 1871 or *Dyscharachthis* (Muona, pers. com.).

Idiotarsus Bonvouloir, 1871

36. Idiotarsus n. sp. 1

Distribution: Peru (Loreto Region).

37. Idiotarsus n. sp. 2

Distribution: Peru (Loreto Region).

Macraulacinae Fleutiaux, 1922
Orodotini Muona, 1993
Ceratogonys Perty, 1830

38. Ceratogonys spinicorne (Fabricius, 1801)

Distribution: South America-Brazil, Colombia, French Guiana, Peru.

Material examined: One specimen was available for study: "PERU: Jauja Prov., Junin Dept., 840m., Sani Benu (8km. E., Satipo) 6–9 Nov, 1935 Felix Woytkowski" (SEMC).

Note: Identification was facilitated through comparison of a single specimen against an illustration of the species in Chassain and Touroult (2011) and specimens provided by Jacques Chassain for the GERP collection. Approximate coordinates for the site is: 11.253917°S, 74.565565°W.

Macraulacini Fleutiaux, 1922
Heterotaxis Bonvouloir, 1872

39. Heterotaxis n. sp.

Distribution: Peru (Loreto Region).

Macraulacus Bonvouloir, 1871

40. Macraulacus n. sp.

Distribution: Peru (unknown region).

Note: Vahtera et. al. (2015) reported an undescribed species from Peru currently in the Muona collection.

Gagatellus Fleutiaux, 1912

41. Gagatellus baeri Fleutiaux, 1912

Distribution: South America-Peru (San Martin Region)

Type locality: "Huallaga prov., Rio Mixiollo, 1800m, 7 August 1900" (Fleutiaux, 1912).

Note: Fleutiaux (1912) described *G. baeri* based on two specimens, one from Peru and another from French Guiana. Chassain (2015) examined Fleutiaux's specimen from French Guiana and determined that a female specimen may instead be one of the two newly described species, that being either *Gagatellus fleutiauxi* or *Gagatellus guyanensis*. *Gagatellus baeri* is now considered a precintive species in Peru, known from its type locality. Rio Mixiollo is a small stream with the coordinates of 8.01667°S, 76.65°W.

Maelodrus Fleutiaux, 1928

42. Maelodrus n. sp.

Distribution: Peru (Loreto Region; 1, "PERU: Tambopata Prov., Madre de Dios Dpte, 15km NE Puerto" / "Maldonado, Reserva, Cuzco Amazonica, 12°33'S, 69°03'W, 200m" / "7 July 1989, J.S. Ashe, R.A. Leschen #436, ex., flight intercept trap" (SEMC))

Somahenecus Cobos, 1964

43. Somahenecus brevicornis (Cobos, 1964)

Distribution: South America – Brazil, Peru.

Material examined: Seven specimens were available for study: 5, "PERU: Loreto Prov., Iquitos, 90 m, 5 May, 1992, J. Danoff-Berg, ex: flight intercept trap" (GERP, SEMC); 1, "PERU: Madre de, Dios, Pantiacolla Lodge, 5.5 km NW, El Mirador Trail, Alto Madre de, Dios River, 500 m, 12°39'10"S, 71°15'28"W, 23–26 Oct 2000; R. Brooks, PERU1B00 100, ex:

flight intercept trap" (SEMC); 1, "PERU: Ucayali Dept., Tingo Maria-Pucallpa Rd., Puente Chino, km 205, 1300 m, 9°8'12"S, 75°47'20"W, 11–14 Oct 1999; R. Brooks, PERU1B99 007A, ex: flight intercept trap" (SEMC).

Note: Identification of the species is based on translated information as well as comparison of the specimens against an illustration of the species provided by Cobos (1964).

Plesiofornax Cocquerel, 1866

44. Plesiofornax curtus Fleutiaux, 1896

Distribution: South America – Bolivia, Brazil, Ecuador, Peru.

Material examined: One specimen was available for study: "Peru: Loreto, 73.5 w 4.8 s, Vacumama, 6–20 VIII-1994" [handwritten] / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / "*Plesiofornax*, *curtus*, Fleutiaux, Det. R.L. Otto, 2013" (GERP).

Identification of the species was made possible through translating and interpreting information from Fleutiaux (1896).

45. Plesiofornax peruvianus Fleutiaux, 1934

Distribution: Peru (Cusco Region).

Type locality: Marcapata (Fleutiaux 1934).

46. Plesiofornax reedi Fleutiaux, 1899

Distribution: South America – Brazil, Peru.

Material examined: One specimen was available for study: "PERU: Dept. Madre de, Dios: Amazonas Lodge, N Atalaya 12°52.2'S, 71°22.6'W 480m, 10–13-XI-2007 D. Brzoska, ex. flight intercept trap, PER1B07 002" (GERP).

Identification of the species was made possible through translating and interpreting information from Fleutiaux (1899b).

47. Plesiofornax n. sp.

Distribution: Peru (Loreto Region).

Silveriola Cobos, 1956

48. Silveriola sublucida (Bonvouloir, 1872)

Distribution: Central America-Costa Rica, Nicaragua, Panama; South America-Brazil, French Guiana, Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios:, CICRA Field Station, garden, 12.56940°S 70.10100°W 260m, 22–29.VII.2010 M.J. Endara, ex. malaise trap, PER10-07-MAT-008" (SEMC).

Note: Identification of the species was facilitated through interpreted section of the species key provided by Bonvouloir (1872) and comparing the specimen against the illustration in the monograph. Additionally, the species' identification was further verified through utilizing the *Plesiofornax* key in Horn (1890).

Spinifornax Fleutiaux, 1926

49. Spinifornax n. sp.

Distribution: Peru (Loreto Region).

Serrifornax Fleutiaux, 1926

50. Serrifornax n. sp.

Distribution: Peru (Loreto Region).

Onichodon Newman, 1838

51. Onichodon sp. e

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Pasco Dept., Villa Rica Rd., 1475m, 10°47'5"S, 75°18'54"W, 15 – 18 Oct 1999; R. Brooks, D. Brzoska, PERU1B99 030C, ex: flight intercept trap" (SEMC).

Note: The specimen certainly belongs to *Onichodon* and has not been compared against any types for species currently placed in *Fornax* for proper specific identification.

52. Onichodon sp. g

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 16–23.IX.2010, M.J. Endara, malaise trap, PER10-09-MAT-016" (SEMC).

Note: The specimen certainly belongs to *Onichodon* and has not been compared against any types for species currently placed in *Fornax* for proper specific identification.

Fornax Laporte, 1835

53. Fornax nr. ***obrutus*** Guérin-Méneville, 1843

Distribution: Peru.

Material examined: Three specimens were available for study: 2, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 16–23.IX.2010, M.J. Endara, malaise trap, PER10-09-MAT-016" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 2–11.X.2010, M.J. Endara, malaise trap, PER10-10-MAT-018" / "EUCNEMIDAE, det. M. Gimmel 2012" ["Eucnemidae" handwritten] (SEMC).

Note: Two specimens of *F. obrutus* from SEMC collected in Honduras and Mexico were identified through the species key provided in Horn (1890). Three Peruvian specimens keyed out to *F. obrutus* in Bonvouloir (1872), however, differs from these specimens based on the base of the frontoclypeal region; that being narrower in *F. obrutus* and wider in *F.* nr. *obrutus*. Shape of the lateral sides of the pronotum is different; basal half is parallel-sided in *F. obrutus* and slightly arcuate in *F.* nr. *obrutus*.

54. Fornax sanguineosignatus Guérin-Méneville, 1843

Distribution: Central America-Costa Rica, Panama; South America-Brazil, Colombia, Peru

Material examined: One specimen was available for study: "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 9–16.IX.2010, M.J. Endara, malaise trap, PER10-09-MAT-015" (SEMC).

Note: Identification of the species was made by comparing the single specimen against the description and illustration of the species in Bonvouloir (1872) as well as previously identified Costa Rican specimen in GERP.

55. Fornax sinuatus Bonvouloir, 1872

Distribution: South America – Brazil, French Guiana, Peru.

Material examined: One specimen was available for study: "Peru, near Iquitos, 05-III-1997, colld by R.J. Buss" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / *Fornax*, *sinuatus*, Bonvouloir, Det. R.L. Otto, 2005" (GERP).

Note: Identification of the species was facilitated through interpreted section of the species key provided by Bonvouloir (1872) and comparing the specimen against the illustration in the monograph.

56. Fornax striatulus Bonvouloir, 1872

Distribution: South America – Bolivia, Brazil, Peru.

Material examined: Six specimens were available for study: 2, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W 260m, 19–26.VIII.2010 M.J. Endara, ex. malaise trap, PER10-08-MAT-012" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 9–16.IX.2010, M.J. Endara, malaise trap, PER10-09-MAT-015" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W 260m, 23.IX–2.X.2010 M.J. Endara, ex. malaise trap, PER10-09-MAT-017" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 2–11.X.2010, M.J. Endara, malaise trap, PER10-10-MAT-018" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W 260m, 1–8. XI.2010 M.J. Endara, ex. malaise trap, PER10-11-MAT-022" (SEMC).

Note: Identification of the species was facilitated through interpreted section of the species key provided by Bonvouloir (1872) and comparing the specimens against the illustration in the monograph.

57. Fornax vareipunctatus Bonvouloir, 1872

Distribution: South America – French Guiana, Peru.

Material examined: One specimen was available for study: "Marcapata, Peru" / M.N. Muzeum, Budapest" / "*Fornax*, spec., det. W. Lucht, 1985" [genus, abbreviated species and year handwritten; black framed white label] / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / *Fornax*, *variepunctatus*, Bonvouloir, Det. R.L. Otto, 2003" (GERP).

Note: Identification of the species was facilitated through interpreted section of the species key provided by Bonvouloir (1872) and comparing the specimen against the illustration in the monograph. Approximate coordinates for Marcapata is 13.591125°S, 70.976924°W.

58. Fornax n. sp. 1

Distribution: Peru (Loreto Region).

59. Fornax n. sp. 2

Distribution: Peru (Loreto Region).

60. Fornax n. sp. 3

Distribution: Peru (Loreto Region).

61. Fornax n. sp. 4

Distribution: Peru (Loreto Region).

62. Fornax n. sp. 5

Distribution: Peru (Loreto Region).

63. Fornax n. sp. 6

Distribution: Peru (Loreto Region).

64. Fornax n. sp. 7

Distribution: Peru (Loreto Region).

65. Fornax n. sp. 8

Distribution: Peru (Loreto Region).

66. Fornax n. sp. 9

Distribution: Peru (Loreto Region).

67. Fornax n. sp. 10

Distribution: Peru (Loreto Region).

68. Fornax n. sp. 11

Distribution: Peru (Loreto Region).

69. Fornax sp. a

Distribution: Peru.

Material examined: Two specimens were available for study: 1, "PERU: Huanuco, Leonpampa region, December 1937, F. Woytkowski" (SEMC); 1, "PERU: Huanuco, Tingo Maria region, 6–14 June 1937, F. Woytkowski" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

70. Fornax sp. c

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Jauja Prov., Junin Dept., Sani, Beni, 840m. ele., 1–10 October 1935, Felix Woytkowski" (SEMC). Sani Beni is a misspelled word on the label and may be referred to Sani Benu instead. Approximate coordinates for the Sani Benu site is: 11.253917°S, 74.565565°W.

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

71. Fornax sp. e

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 16–23.IX.2010, M.J. Endara, malaise trap, PER10-09-MAT-016" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

Cladus Bonvouloir, 1872

72. Cladus maxillaris Bonvouloir, 1872

Distribution: Central America-Costa Rica, Panama; North America-Mexico; South America-Ecuador, French Guiana, Peru.

Material examined: One specimen was available for study: "PERU: Dept. Loreto, 1.5 km N Teniente Lopez, 2°35.66'S, 76°06.92'W, 18 July 1993, 210–240 m, Richard Leschen #139, ex. *Favolus hexagonalis*" (SEMC).

Note: Identification of the species was facilitated through interpreted species description provided by Bonvouloir (1872) and comparing the specimen against the illustration in the monograph. Additionally, the species' identification was further verified in Horn (1890).

Dromaeolus Kiesenwetter, 1858

73. Dromaeolus nr. *batesii* Bonvouloir, 1871

Distribution: Peru.

Material examined: Three specimens were available for study: 1, "PERU: Dept. Madre de, Dios: Pantiacolla Lodge, Alto Madre de Dios R., 12°39.3'S 71°13.9'W 420m, 14–19-XI-2007 D. Brzoska, ex. flight intercept trap, PER1B07 004" (SEMC); 1, "Peru: Madre de Dios Dept., CICRA Field Stn. trail 6, research plot 12.55207°S, 70.10962°W, 295m 9–11.VI.2011, Chaboo team, canopy Malaise trap, bottom sample, PER11-CMB-001" (SEMC); 1, "Peru: Madre de Dios Dept., CICRA Fld Stn. trail 6, research, plot 12.55207°S 70.10962°W, 295m, 11–13.VI.2011, Chaboo, team, canopy Malaise, bottom, sample, PER-11-CMB-002" (GERP).

Note: A single specimen identified as *D. batesii* from GERP collected in French Guiana was based on the translated, interpreted information from the species key provided in Bonvouloir (1871) and later verified through comparison against the illustration in the monograph. Three Peruvian specimens keyed out to *D. batesii* in Bonvouloir (1871), however, differs from the French Guianese specimen and illustration based on the pronotal hind angle; straight in *D. batesii*, divergent in *D.* nr. *batesii*. Ornate arrangements of setae on the elytra differs. Elytral setae are broader in *D. batesii* and slightly narrower in *D.* nr. *batesii*.

74. Dromaeolus bellus Bonvouloir, 1871

Distribution: South America – Brazil, Peru.

Material examined: One specimen was available for study: "PERU: Madre de Dios Dept., Rio Alta Madre de Dios nr. Atayala 495m. 15–18-XI-2007, J.B. Heppner Malaise trap" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] (GERP).

Note: Identification of the species was made possible through translating and interpreting information in the species key from Bonvouloir (1871). Comparison of the specimen against the illustration in the monograph further confirms the identification. Approximate coordinates for the site is 12°52.2'S, 71°22.6'W.

75. Dromaeolus fuliginosus Bonvouloir, 1871

Distribution: South America – French Guiana, Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios Dept., CICRA Field Stn. trail 6, research plot 12.55207°S, 70.10962°W, 295m 9–11.VI.2011, Chaboo team, canopy Malaise trap, bottom sample, PER11-CMB-001" (SEMC).

Note: Identification was based on the comparison of the Peruvian specimen against an authoratively identified specimen provided to the GERP collection by Jacques Chassain.

76. Dromaeolus funckii Bonvouloir, 1871

Distribution: Peru, Venezuela.

Material examined: One specimen was available for study: "PERU: Dept. Madre de, Dios: Pantiacolla Lodge, Alto Madre de Dios R., 12°39.3'S 71°13.9'W 420m, 14–19-XI-2007 D. Brzoska, ex. flight intercept trap, PER1B07 004" (SEMC).

Note: Identification of the species was made possible through translating and interpreting information in the species key from Bonvouloir (1871).

77. Dromaeolus morio (Erichson, 1847)

Distribution: Peru (unknown locale).

Type locality: unknown.

Note: Blackwelder (1944) listed Peru as the only country for which the species is known.

78. Dromaeolus variegatus Horn, 1890

Distribution: Central America – Costa Rica, Guatemala, Honduras; South America-Brazil, Peru.

Material examined: One specimen was available for study: "PERU: Dept. Madre de, Dios: Pantiacolla Lodge, Alto Madre de Dios R., 12°39.3'S 71°13.9'W 420m, 14–19-XI-2007 D. Brzoska, ex. flight intercept trap, PER1B07 004" (SEMC).

Note: Identification of the species was made possible through the species key provided by Horn (1890) and further verified through comparisons against previously identified specimens maintained in GERP.

79. Dromaeolus n. sp. 1

Distribution: Peru (Loreto Region).

80. Dromaeolus n. sp. 2

Distribution: Peru (Loreto Region).

81. Dromaeolus n. sp. 3

Distribution: Peru (Loreto Region).

82. Dromaeolus n. sp. 4

Distribution: Peru (Loreto Region).

83. Dromaeolus n. sp. 5

Distribution: Peru (Loreto Region).

84. Dromaeolus n. sp. 6

Distribution: Peru (Loreto Region).

85. Dromaeolus n. sp. 7

Distribution: Peru (Loreto Region).

86. Dromaeolus n. sp. 8

Distribution: Peru (Loreto Region).

87. Dromaeolus n. sp. 9

Distribution: Peru (Loreto Region).

88. Dromaeolus sp. a

Distribution: Peru.

Material examined: Two specimens were available for study: 1, "Peru: Madre de Dios, Tambopata Wildlife Res, 30 km SW Pto. Maldonado, 12°50'S, 69°20'W, 290m, 18–20-XI-1982, Joseph J. Anderson Coll." (CNHM); 1, "Peru: Madre de Dios, 30km SW Pto. Maldonado, 12-50S, 69-20W, 290 m, Tambopata Res., 1–14, Mar 1983, J. Anderson" (CNHM).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

89. Dromaeolus sp. l

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Madre de Dios Dept., CICRA Fld Stn, trail 6 research, plot, 12.55207°S 70.10962°W, 295m, 11–13.VI.2011, Chaboo, team, canopy Malaise, bottom, sample, PER-11-CMB-002" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

90. Dromaeolus sp. m

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Dept. Madre de, Dios: Pantiacolla Lodge, Alto Madre de Dios R., 12°39.3'S 71°13.9'W 420m, 14–19-XI-2007 D. Brzoska, ex. flight intercept trap, PER1B07 004" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

91. Dromaeolus sp. n

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Ucayali Dept., Tingo Maria-Pucallpa Rd., Puenta Chino, km 205, 1300m, 9°8'12"S, 75°47'20"W, 11–14 Oct 1999, R. Brooks, PERU1B99 007A, ex: flight intercept trap" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

92. Dromaeolus sp. o

Distribution: Peru.

Material examined: Two specimens were available for study: 1, "PERU: Madre de Dios, Pantiacolla Lodge, 400 m, Alto Madre de Dios River, 12°39'22"S 71°13'55"W, 23–26 Oct 2000, R. Brooks, PERU1B00 099, ex: flight intercept trap" (SEMC); 1, "PERU Madre de Dios, Cocha Cashu Bio. Stn., Manu National Park, 350 m, 11°53'45"S, 71°24'24"W, 17–19 Oct 2000; R. Brooks, PERU1B00 042, ex: flight intercept trap" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

93. Dromaeolus sp. q

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Dept. Cusco:, Cock of the Rock Lodge, NE Paucartambo 13°03.3'S, 71°32.7'W, 1120m, 4–9-XI-2007 D. Brzoska. ex. flight intercept trap, PER1B07 001" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

94. Dromaeolus sp. v

Distribution: Peru.

Material examined: One specimen was available for study: "PERU: Dept. Junin:, Pampa Hermosa Lodge, 22 km N. San Ramon, 10°59.3'S 75°25.5'W 1220m, 24–27-XI-2007 D. Brzoska, ex. flight intercept trap, PER1B07 006" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

95. Dromaeolus sp. x

Distribution: Peru.

Material examined: Three specimens were available for study: 2, "PERU: Dept. Cusco:, Cock of the Rock Lodge, NE Paucartambo 13°03.3'S, 71°32.7'W, 1120m, 4–9-XI-2007 D. Brzoska. ex. flight intercept trap, PER1B07 001" (SEMC); 1, "PERU: Ucayali Dept., Tingo Maria-Pucallpa Rd., Puente Chino, km 205, 1300 m, 9°8'12"S, 75°47'20"W, 11–14 Oct 1999; R. Brooks, PERU1B99 007A, ex: flight intercept trap" (GERP).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

96. Dromaeolus sp. z

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 18–25.X.2010, M.J. Endara, malaise trap, PER10-10-MAT-020" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

97. Dromaeolus sp. aa

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Madre de Dios Dept. CICRA Fld Stn. trail 6, research, plot, 12.55207°S, 70.10962°W, 295m 7–9.VI.2011, Chaboo team, flight intercept trap, PER11-FIT-029" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

98. Dromaeolus sp. bb

Distribution: Peru.

Material examined: Two specimens were available for study: "Peru: Madre de Dios Dept., CICRA Fld Stn. trail 6 research, plot, 12.55207°S, 70.10962°W, 295m 11–13.VI.2011, Chaboo, team, canopy Malaise, bottom, sample, PER11-CMB-002" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species unrecorded in Peru.

Thambus Bonvouloir, 1871

99. Thambus deyrollei Bonvouloir, 1871

Distribution: South America – Brazil, Bolivia, Peru

Material examined: One specimen was available for study: "PERU: Dept. Junin, Pampa, Hermosa Lodge, 5–7-XI-2009, 1220m, colls: J.B. Heppner, C. Carrera, E. Huamani" / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / "*Thambus*, *deyrollei*, Bonvouloir, Det. R.L. Otto, 2015" (GERP).

Note: Identification of the species was made possible through translating and interpreting information in the species key from Bonvouloir (1871). Approximate coordinates for the Pampa Hermosa Lodge is 10°59.3'S 75°25.5'W.

100. Thambus diversus Bonvouloir, 1871

Distribution: South America – Brazil, Peru.

Material examined: One specimen was available for study: "PERU Cocha Cachu, Rio Manu, Madre de Dios, IX 7 1983" [month, day and year handwritten] / "D. Hunt, Colr." / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] / "*Thambus*, *diversus*, Bonvouloir, Det. R.L. Otto, 2008" (GERP).

Note: Identification of the species was made possible through translating and interpreting information in the species key from Bonvouloir (1871). Cocha Cachu may be a misspelled word on the label and could be in reference to Cocha Cashu instead. Coordinates for Cocha Cashu, a biological station is 11°54'S and 71°22'W.

101. Thambus sp.

Distribution: Peru.

Material examined: One specimen was available for study: "Peru: Loreto, Rio, Yanomono, 50 km NE, Iquitos, 3-23S, 72-52W, 10 Mar 1993, L.J. Davenport" (CNHM).

Note: I have not been able to ascertain whether the species is undescribed or belong to an existing species misplaced in *Dromaeolus* that is unrecorded in Peru. Approximate coordinates for Rio Yanamono is -3.443851°S, -72.842491°W.

Deltometopus Bonvouloir, 1871

102. Deltometopus fulvicornis Bonvouloir, 1871

Distribution: South America – French Guiana, Peru.

Material examined: One specimen was available for study: "PERU: Madre de Dios, Pakitza Bio. Stn., Castanal Traiul, Reserved Zone, Manu National Park, 11°56'41"S, 71°17'0"W, 317 m, 15–16 Oct 2000, R. Brooks, PERU1B00 013 ex: flight intercept trap" (SEMC)"

Note: Identification of the species was made possible through translating and interpreting information in the species key from Bonvouloir (1871).

103. Deltometopus sp. d

Distribution: Peru.

Material examined: Three specimens were available for study: 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 2–11.X.2010, M.J. Endara, malaise trap, PER10-10-MAT-018" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 25.X–1.XI.2010, M.J. Endara, malaise trap, PER10-10-MAT-021" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Station, garden, 12.56940°S 70.10100°W 260m, 1–8.XI.2010, M.J. Endara, ex. malaise trap, PER10-11-MAT-022" (SEMC).

Note: I have not been able to ascertain whether the species is undescribed or an existing species unrecorded in Peru.

Nematodini Leiler, 1976
Neomathion Fleutiaux, 1930

104. Neomathion leprieuri (Laporte, 1835)

Distribution: Caribbean-Cuba; North America – Mexico; South America – Bolivia, Brazil, Colombia, French Guiana, Peru, Venezuela.

Note: Cuban record for *N. leprieuri* requires further confirmation. No Peruvian specimens were encountered during course of this study.

Nematodes Berthold, 1827

105. Nematodes conjunctus Bonvouloir, 1872

Distribution: Central America-Costa Rica, Nicaragua; South America-Bolivia, Paraguay, Peru, Venezuela.

Material examined: Three specimens were available for study: 1, "PERU: Jauja Prov., Junin Dept., 840m., Sani Benu (8km. E., Satipo) 17–30 Aug., 1935 F. Woytkowski" (SEMC); 1, "PERU: Madre de Dios, Pakitza Bio. Stn., Castanal Trail, Reserved Zone, Manu National Park, 11°56'41"S, 71°17'0"W, 317 m, 15–16 Oct 2000; R. Brooks, PERU1B00 013 ex: flight intercept trap" (SEMC); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 26.VIII–2. IX.2010, M.J. Endara, malaise trap, PER10-08-MAT-013" (SEMC).

Note: Identification of these specimens are based on translated identification key provided by Bonvouloir (1872). Approximate coordinates for the Sani Benu site is: 11.253917°S, 74.565565°W.

106. Nematodes cylindricus (Laporte, 1835)

Distribution: Central America – Belize, Nicaragua, Panama; South America – Bolivia, Brazil, Colombia, French Guiana, Peru, Venezuela.

Material examined: Two specimens were available for study: 1, "PERU: Huanuco reg., 26 km N. Tingo-Maria, Puerto Cayamba vill., 750m, 5–10.IV.2008, local coll." / "Collection of the Global, Eucnemid Research Project, (Robert L. Otto)" [green framed white label] (GERP); 1, "Peru: Madre de Dios:, CICRA Field Stn. garden, 12.56940°S 70.10100°W, 260m 29.VII–5.VIII.2010, M.J. Endara, malaise trap, PER10-07-MAT-009" (SEMC).

Note: Identification of these specimens are based on translated identification key provided by Bonvouloir (1872).

107. Nematodes peruvianus Cobos, 1964

Distribution: South America – Bolivia, Peru (Junin Region).

Type locality: "Junin Region, Sani Beni, 13 July 1935" (holotype); "Junin Region, Chanchamayo" (allotype and paratype) (Cobos 1964).

Discussion

The current study has added 58 species to the Peruvian fauna. Vahtera et. al. (2015) included eight genera in the identification key that may be present in Peru. They include: *Phlegon* Laporte 1841, *Calyptocerus* Guérin-Méneville 1843, *Paraxylophilus* Cobos 1964, *Arrhipis* Bonvouloir 1871, *Golbachia* Cobos 1955, *Bossionus* Fleutiaux 1922, *Entomosatropus* Bonvouloir 1871 and *Monrosina* Cobos 1958. These eight genera have not been recorded yet in Peru. Future surveys in Peru may yield additional opportunities to encounter more eucnemids not present in previous surveys.

Information on habitat types from which newer material were collected are unavailable. Future surveys in Peru with notations of these habitats can be compared against information provided by Vahtera et al (2015). These results can be compared to the Iquitos study to discuss and gain a better understanding on the overall biodiversity of the family in different forest types throughout Peru.

Revisions of different likely monophyletic groups within the family at the continental and/or global level must be undertaken to include descriptions of new species and assessing current placements of different species within the group. Many large groups (i.e. *Microrhagus*, *Fornax* and *Dromaeolus*) requires a huge undertaking to resolve problems of paraphyleticism present in these groups, especially on a global scale.

My next steps are to continue identifying the species assembled in this study, which may well include many new species and imaging these species for future publication opportunities. Furthermore, correspondence with Jyrki Muona will take place to determine if those species from the two museums are conspecific to the species he is currently working with for the Neotropical revision based on their previous surveys in the Loreto Region of Peru. Further field work to unlock the beetles' development by associating collected larvae with the reared adults will yield a greater understanding of the family's role in the natural world,

especially since only two larvae in South America have been described (see Costa et al. 1988; Teixeira & Casari-Chen 1994).

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Literature cited

Blackwelder R.E. 1944–1957. Checklist of the Coleopterous insects of Mexico, Central America, the West Indies, and South America. Parts 1 through 6. United States National Museum Bulletin 185: I–XII, 1–1492.

Bonvouloir H.A. de. 1871. Monographie de la famille de Eucnémides, 1st part. Annales de la Société Entomologique de France (Supplement): 1–288, plates 1–21 [in French].

Bonvouloir H. A. de. 1872. Monographie de la famille de Eucnémides, 2nd part. Annales de la Société Entomologique de France (Supplement): 289–560, plates 22–36 [in French].

Chaboo C.S. 2015. Beetles (Coleoptera) of Peru: A survey of the Families. Part I. Overview. Journal of the Kansas Entomological Society 88 (2): 135–139. doi: 10.2317/0022-8567-88.2.135

Chassain J. 2015. Note sur Gagatellus baeri Fleutiaux, 1912 et description de deux espèces guyanaises nouvelles de genre Gagatellus (Coleoptera: Eucnemidae), p. 60–63. In: Touroult, J. (ed.): Contributions à l'Étude des Coléoptères de Guyane Tome IX. ACOREP-France, Paris, 128pp [in French].

Chassain J. & J. Touroult. 2011. Le Eucnémides de Guyane (Coleoptera: Eucnemidae), p. 78–88. In: Touroult, J. (ed.): Contributions à l'Étude des Coléoptères de Guyane Tome III. ACOREP-France, Paris, 88pp [in French].

Cobos A. 1964. Materiales para el estudio de la familia Eucnemidae. Primera parte (Coleoptera). Eos. 40(3-4): 289–435 [in Spanish].

Cobos A. 1972. Un nuevo género y especie de Eucnemidae del Perú. Acta Zoologica Lilloana 26(15): 237–242 [in Spanish].

Costa C., S.A. Vanin & S.A.Casari-Chen 1988. Larvas de Coleoptera do Brasil. Museu de Zoologia, Universidade de São Paulo. 282 pp. 165 plates [in Portugese].

Fleutiaux E. 1896. Eucnémides Nouveaux. Mémoires de la Société Zoologique de France 9: 300–315 [in French].

Fleutiaux E. 1899a. Notes sur quelques Eucnémides et descriptions d'espèces nouvelles. Annales de la Société Entomologique de Belgique 43: 22–31 [in French].

Fleutiaux E. 1899b. Eucnemidae de la collection Fry. Annales de la Société Entomologique de Belgique 43: 220–249 [in French].

Fleutiaux E. 1912. Descriptions de Melasidae nouveaux. Annales de la Société Entomologique de Belgique 56: 296–304 [in French].

Fleutiaux E. 1934. Description d'Eucnemididae nouveaux. Extrait des Annales de l'Association de Naturalistes de Levallois-Perret 21: 73–107 [in French].

Horn G. 1890. Fam. Eucnemidae. Biologia Centrali-Americana, Insecta, Coleoptera, Serricornia, Volume III, part 1: 210–257, plate 10.

Muona J. 1987. The Generic Names of the Beetle Family Eucnemidae (Coleoptera). Entomologica Scandinavica 18: 79-92.

Muona J. 1993. Review of the Phylogeny, Classification and Biology of the Family Eucnemidae (Coleoptera). Entomologica Scandinavica Supplement 44: 133 pp.

Muona J. 2000. A Revision of the Nearctic Eucnemidae. Acta Zoologica Fennica. 212: 106 pp.

Muona J. 2010. 4.5 Eucnemidae Eschscholtz, 1829 (pp. 61–69) In: Leschen, A. B., Beutel, R. G., Lawrence, J. F., Ślipiński, A. (Eds.) Coleoptera, Beetles. Volume 2: Morphology and Systematics (Elateroidea, Bostrichiformia, Cucujiformia partim). Handbook of Zoology. Arthropoda: Insecta, Series Editors N. P. Kristensen and R. G. Beutel. De Gruyter, Berlin/New York, xiii+786 pp.

Otto R.L. 2015. Eucnemid larvae of the Nearctic region. Part V: Fifth instar larval descriptions for eight species of Microrhagus Dejean, 1833 (Coleoptera: Eucnemidae: Melasinae: Dirhagini), with descriptions of four new species and notes on their biology. Insecta Mundi 0421: 1–46.

Otto R.L. 2016. The false click beetles (Coleoptera: Eucnemidae) of Laos. Entomologica Basiliensia et Collectionis Frey 35: 181–427.

Otto R.L. & J.P. Gruber 2016. Eucnemid larvae of the Nearctic region. Part VI: Descriptions of the fifth instar and prepupal larval stages of Stethon pectorosus LeConte, 1866 (Coleoptera: Eucnemidae: Eucneminae: Mesogenini), with notes on their biology. Insecta Mundi 0474: 1–11.

Teixeira E.P. & S.A. Casari-Chen 1994. Description of larva and pupa of Xylophilus othoides (Fleutiaux, 1899) (Coleoptera: Eucnemidae: Melasinae). Iheringia Série Zoologia (76): 43–47 [in Portugese].

Vahtera V., J. Muona, A. Linna & I. Sääksjärvi. 2015. Nine genera of Eucnemidae (Coleoptera) new to Peru, with key to Peruvian genera. Biodiversity Data Journal 3: e4493. doi: 10.3897/BDJ.3.e4493