

Two new genera of Agathidinae (Hymenoptera: Braconidae) with a key to the genera of the New World

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Abstract

Two new genera of Agathidinae (Hymenoptera: Braconidae) are described, *Amputoearinus* Sharkey **n. gen.**, and *Austroearinus* Sharkey **n. gen.** Biological information is given for members of both genera. Five new species are described, *Amputoearinus matamata* Sharkey **n. sp.**, *Amputoearinus fernandezi* Sharkey **n. sp.**, *Austroearinus chrysokeras* Sharkey **n. sp.**, and *Austroearinus melanopodes* Sharkey **n. sp.** Two new combinations are made, *Austroearinus rufofemoratus* **n. comb.**, *Austroearinus unicolor* (Schrottkey) **n. comb.** A key to the genera of the New World is presented.

Key words: *Amputoearinus*, *Austroearinus*, taxonomy, parasitoid, wasp

Introduction

The Agathidinae is a moderately large subfamily of Braconidae with approximately 2,000 species, most of which are not described. It has a worldwide distribution and members are found in most terrestrial habitats. Though all known species are koinobiont endoparasitoids of Lepidoptera larvae, life history traits vary considerably. Depending on the species, they may be nocturnal or diurnal, gregarious or solitary, attack exposed or concealed hosts, and attack any larval instar. In general they are solitary, attack first instar Lepidoptera larvae in concealed microhabitats such as leaf-rolls or stems, and emerge from the last larval instar after it has spun its cocoon. Several species of *Zelomorpha* Ashmead are known to be gregarious (Sarmiento et al., [as *Coccygidium*] 2004). Detailed studies of life history have been conducted for a few species (e.g., Simmonds 1947, Dondale 1954, Odebiyi and Ottman 1972, 1977, Janzen et al. 1998) and a few have been used in classical biological control efforts.

Currently there are about 50 genera recognized (Sharkey 1992). The history of higher classification of the Agathidinae is summarized in Sharkey (1992) who also proposed a tribal-level classification based on ground-plan coding.

The purposes of this paper are to describe two new genera from the New World and some of their constituent species. These are being justified from a phylogenetic perspective in a forthcoming paper (Sharkey et al., in prep).

Methods

Morphological terminology is based on Sharkey and Wharton (1997).

Abbreviations for collections: **AEI**, American Entomological Institute, Gainesville, Florida, USA. Dr. David Wahl. **CNCI**, Canadian National Collection of Insects, Ottawa. Dr. Henri Goulet. **EMUS**, Utah State University, Logan, Utah, Dr. James Pitts. **HIC**, Hymenoptera Institute Insect Collection. University of Kentucky, Lexington, Kentucky, USA, Dr. Mike Sharkey. **IvH**, Instituto Alexander von Humboldt, Villa de Leyva, Colombia, Ms. Diana Arias. **INBC**, Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica, Ms. Carolina Godoy. **RMNH**, Nationaal Natuurhistorisch Museum, Leiden, Netherlands. Dr. Kees van Achterberg. **USNM**, United States National Museum, Washington, D.C., Dr. David Smith.

Key to the New World Genera of Agathidinae

This key incorporates changes in generic concepts that have occurred since Sharkey's 1997 key, e.g., Sarmiento and Sharkey (2005), Pucci and Sharkey (2004). It also includes several changes that are the result of a cladistic analysis of agathidine genera (Sharkey et al., in prep.).

Figure numbers in square brackets refer to those in Sharkey (1997)

1. Fore tarsal claw cleft, i.e. with 2 sharp teeth [Figs 19, 20]..... 2
- Fore tarsal claw simple or with basal lobe [Figs 21, 22, 23] 5
- 2(1). Ovipositor sheaths longer than half length of metasoma. Base of fore tarsal claw usually (85%) pectinate, with a comb-like row of teeth [Fig. 20]. Gena elongate [as in Fig. 32]..... 3
- Ovipositor sheaths shorter than half length of metasoma [Fig. 25]. Base of fore tarsal claw not pectinate [Fig. 19]. Gena not elongate [as in Fig. 33].....*Zelomorpha* Ashmead. [Note: Justification for the reinstatement of *Zelomorpha* is presented in a cladistic analysis in Sharkey et al., in prep]
- 3(2). Lateral carina of frons present [Fig. 26].....*Cremonops* Foerster
- Lateral carina of frons absent [Fig. 27] 4
- 4(3). Propodeum areolate with fine granulate microsculpture in posterior areolae [Fig. 28]. Petiole twice as wide at apex as at base [Fig. 28]*Labagathis* Enderlein

- Propodeum areolate without granulate microsculpture [Fig. 29]. Petiole about as wide at apex as at base [Fig. 29].....*Zacremnops* Sharkey and Wharton
- 5(1). Fore wing (RS+M)a complete [Fig. 9]. Notauli absent 6
- Fore wing (RS+M)a incomplete [Fig. 3]. Notauli variable 8
- 6(5). Tarsal claws simple [as in Fig. 23] *Sesioctonus* Viereck (in part)
- Tarsal claws with basal lobe [as in Fig. 22]..... 7
- 7(6) Propleuron with projection (Fig. 2d). Ovipositor not longer than metasoma.....
.....*Amputoearinus* Sharkey n. gen.
- Propleuron without projection. Ovipositor longer than metasoma.....
.....*Earinus* Wesmael
- 8(5). Labio-maxillary complex elongate (galea longer than wide and usually longer than mandible) [Fig. 32] 9
- Labio-maxillary complex of normal dimensions (galea at most as long as wide and usually shorter than mandible) [Fig. 33]..... 12
- 9(8). Frons bordered laterally with groove [Fig. 35], Neotropical..*Trachagathis* Viereck
- Frons not bordered laterally with groove [Fig. 36], North and Central America. 10
- 10(9). Strong transverse carina between hind coxae present [Fig. 38]; hind coxa and metasoma separated by wide sclerite [Fig. 38]..... *Bassus* s.s. Fabricius (in part)
- Strong transverse carina between hind coxae absent [Fig. 37]; hind coxa and metasoma sharing common foramen, or hind coxa and metasoma separated by narrow sclerite [Fig. 37]..... 11
- 11(10). Mandible thick; teeth of mandible round in cross-section, not flattened [Fig. 41]. Pegs at apex of hind tibia flattened, spoon-like (high magnification).....
.....*Agathirsia* Westwood
- Mandible thin; teeth of mandibles flat in cross section [Fig. 42]. Pegs at apex of hind tibia cone-shaped, not flattened at apex (high magnification).....
.....*Agathis* Latreille (in part)
- 12(8). Fore wing RS2 long and tubular [Fig. 11]. Ovipositor barely exerted
.....*Marjoriella* Sharkey
- Fore wing RS2 absent or weak [Figs 3, 4]; if present then ovipositor at least half as long as metasoma..... 13
- 13(12). Fore wing venation much reduced, second submarginal cell open or absent; vein RS not reaching wing margin [Figs 13, 15]. Propodeum granulate [Fig. 44] 14
- Fore wing venation not greatly reduced, second submarginal cell open or closed, never absent; vein RS usually complete, when incomplete there remains an apical portion meeting wing margin [Figs 1–8]. Propodeum variable, usually (90%) not granulate 15
- 14(13). Tarsal claw with basal lobe [as in Fig. 22]. Combined discal + first submarginal cell of fore wing present [Fig.15] *Plesiocoelus* van Achterberg
- Tarsal claw simple, without basal lobe [as in Fig. 23]. Combined discal + first sub-

- marginal cell of fore wing absent [as in Fig. 13]..... *Mesocoelus* Schulz
- 15(13). Frons margined laterally with carina [Fig. 45] 16
- Frons not margined laterally with carina [Fig. 36] 17
- 16(15). Petiole with 2 dorsal carinae that do not meet medially [Fig. 46].. *Pharpa* Sharkey
- Petiole usually (90%) without 2 dorsal carinae but if present then these meet medially [Figs 47, 48]..... *Alabagrus* Enderlein
- 17(15). Gena greatly expanded posteroventrally [Fig. 49] 18
- Gena not greatly expanded posteroventrally [Fig. 33] 19
- 18(17). Fore wing 2RS and r-m partly fused, thus second submarginal cell appearing petiolate [Fig. 18]. Propleuron with distinct bump [Fig. 50]..... *Zamicrodus* Viereck
- Fore wing 2RS and r-m separated by short but distinct 3RSa, thus second submarginal cell not petiolate [Fig. 1]. Propleuron usually lacking distinct bump [as in Fig. 43]..... *Bassus* s.s Fabricius (in part)
- 19(17). Notauli present [Fig. 51]..... 20
- Notauli absent [Fig. 53] 21
- 20(19). Petiole sculptured, at least in part [as in Fig. 40]. Tarsal claws with basal lobe [Figs 21, 22]. Hind tibia with apical pegs..... *Bassus* Fabricius (in part)
- Petiole smooth [as in Fig. 39]. Tarsal claws simple, lacking basal lobe [Fig. 23]. Hind tibia without apical pegs..... *Crassomicrodus* Ashmead
- 21(20). Tarsal claws simple [as in Fig. 23] *Sesioctonus* Viereck (in part)
- Tarsal claws with basal lobe [as in Fig. 22] 22
- 22(21). Hind coxal cavities separated from metasomal foramen by wide sclerite [Fig. 52]. *Bassus* Fabricius (in part)
- Hind coxal cavities not separated from metasomal foramen [Fig. 54] or separated by a very narrow sclerite [as in Fig. 37]..... *Austroearinus* Sharkey **n. gen.**

Descriptive Section

Method

Species descriptions refer to the holotype female; variation in the paratypes, including males, is presented in parentheses.

Amputoearinus Sharkey **n. gen.**

(Figs 1a, 2a–d, 3a–c)

Diagnosis

Amputoearinus can be distinguished from all other agathidine genera with the following combination of characters: tarsal claws with a basal tooth; propleuron with

ventromedial prominence; RS+M vein of fore wing complete (Fig. 1a); gena with acute posteroventral extension (Fig. 2b); ovipositor shorter than metasoma (Fig. 1a).

Description

Head: Lateral carina on frons absent (Fig. 2a); interantennal space with two prominences separated by shallow groove (Fig. 2a); gena extended ventroposteriorly into sharp prominence (Fig. 2b); labial palpus with four segments, third segment not reduced; apical antennomere acute; antennal insertion bordered anteriorly, medially, and laterally by elevated ridge. *Mesosoma:* Mesoscutum smooth; notauli lacking; posteroscutellar depression absent; propodeum from completely smooth to carinate with anterior transverse carina and with pair of longitudinal carinae enclosing median areola (Fig. 3c); propleuron with a projection at midheight which varies from a smooth swelling to a sharp cone-like projection (Fig. 2d); hind coxal cavities closed. *Legs:* Foretibia lacking pegs, foretarsal claws with quadrate basal lobe; basal lobe with tuft of pectination basally (Fig. 2c); midtibia with apical and medial pegs; hind tibia with apical pegs. *Wings:* Fore wing RS + M vein complete and tubular throughout (Fig. 1a); second submarginal cell triangular (Fig. 1a) to weakly quadrate; fore wing 3RSb straight; hind wing r and r-m crossveins absent; hind wing CUB absent even as spectral vein. *Metasoma:* Median tergites smooth, lacking carinae and sculpture (Figs 3a, b); median syntergite 2 + 3 with 3 transverse grooves delimiting four distinct regions (Fig. 3b); anterior region projecting posteromedially; penultimate region projecting anteromedially resulting in second region appearing in the shape of an hourglass when viewed dorsally; ovipositor mildly decurved, shorter than metasoma (Fig. 1a).

Distribution

Neotropical, from Costa Rica to southern extensions of the Amazon basin in Brazil and Bolivia.

Species diversity

Including the two described here, there are 16 species in the possession of the senior author, and likely at least twice that number are extant.

Biology (Dan Janzen, pers. comm.)

A specimen of an undescribed species (This is the species illustrated in figures 1a, 2a–d, and 3a–c.) from Guanacaste Province, Costa Rica, was reared from a microlepidopteran that appeared to be Elachistidae (Stenominae) feeding on a mature leaf of *Genipa americana* (Rubiaceae) and living under a thin silk web. The moth spun a sloppy white cocoon on February 1, 1995 in a fold of a leaf, and the agathidine cocoon was spun inside the moth cocoon, with the wasp larva emerging from the prepupal caterpillar. The wasp eclosed 7 days later, in what was the first half of the long dry season, a time of

year when caterpillars are exceptionally scarce in the dry forests of the Area de Conservacion Guanacaste (ACG). The site is 260 m elevation, Lat 10.89249 Long - 85.60336 and locally known as Alacran in Sector Santa Rosa of the ACG. The entire record may be found at <http://janzen.sas.upenn.edu>, refer to specimen number 92-SRNP-227.

Type species

Amputoearinus fernandesi Sharkey n. sp.

Etymology

From the Latin *amputo* which means amputate or amputation referring to the relatively short ovipositor possessed by species of this group when compared to *Earinus*. The name is masculine.

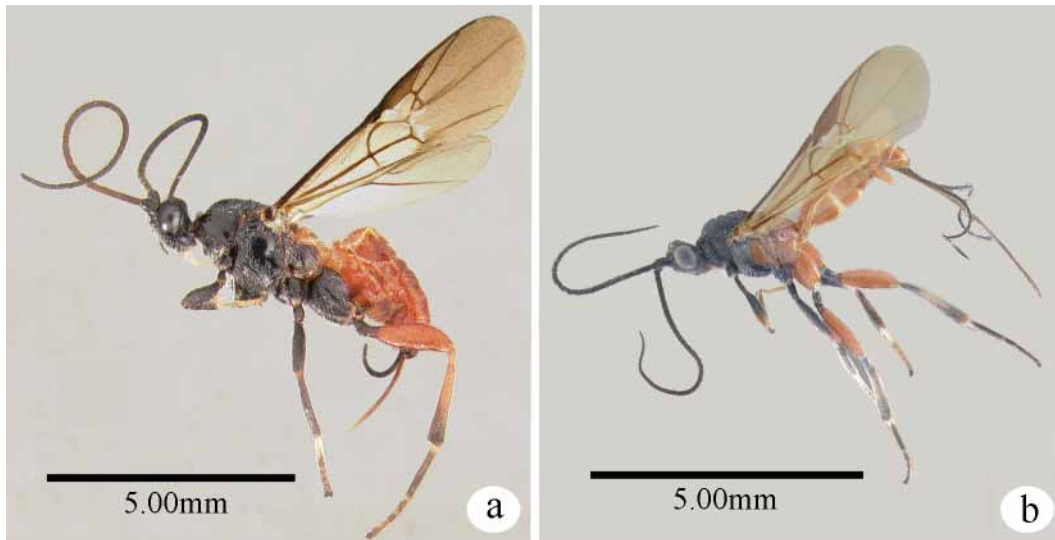


FIGURE 1. Lateral habitus photographs. a) *Amputoearinus* sp. b) *Austroearinus rufofemoratus*.

Amputoearinus matamata Sharkey n. sp.

Diagnosis

May be distinguished from all other known members of the genus with the following combination of characters: fore wing banded (yellow, black, yellow, black); median areola of metanotum well defined with sharp carinae laterally and posteriorly; projection of propleuron sharp, dorsoventrally flattened and wide, almost in the form of a transverse shelf.

Description

Body length. 7.1 (7.1–7.4) mm. *Head.* Antenna with 43 (43–45) flagellomeres; gena greatly extended ventrally (c.f. Fig. 2b). *Mesosoma.* Scutellar sulcus lacking longitudinal carinae; projection of propleuron sharp (c.f. Fig. 2d), dorsoventrally flattened and wide, almost in the form of a transverse shelf; median areola of metanotum well defined with sharp carinae laterally and posteriorly; sternaulus represented by a smooth groove in posterior half of mesosoma; margin between metepimeron and metepisternum smooth with a few weak transverse carinae; midtibia, lacking pegs at midlength and with 1 subapical peg; hind tibia with 3 apical pegs; r-m crossvein of fore wing curved such that the 2nd submarginal cell is rounded distally; fore wing length 7.5 (7.4–8.2) mm; propodeum mostly smooth with pair of short carinae fused anteriorly to appear as an inverted v-shape, in posterior view. *Metasoma.* First median tergite evenly convex; median syntergite 2+3, length 1.6mm, width 1.2mm. *Color:* Black except palpi pale yellow and body yellowish orange as follows: fore and mid legs except apical tarsomere, hind femur and basal 2/3 of tibia, propodeum and propodeal pseudosternite, first 4 metasomal segments and anterior portion of segment 5; fore wing banded from base: yellow, black, yellow, black; hind wing mostly yellow except for extreme apex infuscate. (The lone male specimen from Brazil differs in having the ventral portions of the mesopleuron and hind coxa yellow.)

Distribution

Known only from 6 specimens from the western Amazon Basin.

Etymology

Named after the type locality, Matamata, which is also the common Colombian name for the South American turtle, *Chelus fimbriatus* Schneider.

Material examined

Holotype ♀: **COLOMBIA**, Amazonas, PNN Amacayacu, Matamata, 3°41'S 70°15'W 150m, Malaise, 12–17 March, 2001, D. Chota Leg. M.2765. (IAvH). Paratypes: ♂, **BRAZIL**, Para, Faz Taperina, 21–23. Nov.1969, J&B Campbell (AEI). **COLOMBIA**: ♀, Amazonas, PNN Hamacayacu (sic.) (= Amacayacu), Malaise, Feb. [19]89, M. Kelsey, [antennae broken] (IAvH). ♀, Amazonas, PNN Amacayacu, San Martín, 3°46'S 70°18'W, 150m, Malaise 19–27, Oct. 2000, B. Amado, M.839, secondary DNA voucher DM027s, (HIC). ♀, Amazonas, Amacayacu Park, west of Leticia, 3°48'S 70°18'W 150m, 1–4 Sept, 1997, Sweep, Sharkey, DNA voucher DM027 [metasoma and left hind leg missing (HIC)]. **ECUADOR**: ♀, Sucumbios (sic) [= Succumbios], Rio Napo, Sacha Lodge, 0° 30'S, 76° 30' W, 220–230m, 16–27, Oct., 1994, MT, P. Hibbs [body broken and placed on 4 separate triangles, mesosoma except wings missing, left antenna broken] (HIC).

Amputoearinus fernandesi Sharkey n. sp.*Diagnosis*

May be distinguished from all other known members of the genus with the following combination of characters: head except all flagellomeres, pedicel and lateral surface of scape black; wings infusate with or without pale color but lacking distinct yellow color; projection of propleuron rounded; median areola of metanotum well defined with sharp carinae laterally and posteriorly

Description

Body length 6.0 (5.8–6.1) mm. *Head.* Antenna with 37 (37–40) flagellomeres; gena greatly extended ventrally (c.f. Fig. 2b). *Mesosoma.* Scutellar sulcus lacking longitudinal carinae; median areola of metanotum well defined with sharp carinae laterally and posteriorly; projection of propleuron rounded, not dorsoventrally flattened; sternaulus a smooth groove in posterior 1/5 of mesosoma; margin between metepimeron and metepisternum smooth, lacking transverse carinae; midtibia with 3 or 4 (2–4) pegs at midlength, lacking subapical pegs; hind tibia with 5 (4–5) apical pegs; r-m crossvein of fore wing not distinctly curved; fore wing length 6.0 (5.8–6.0) mm; propodeum mostly smooth with pair of short carinae fused anteriorly to appear as an inverted v-shape in posterior view (sometimes reduced to a small bump). *Metasoma.* First median tergite weakly convex, almost flat; median syntergite 2+3 length 1.4 mm, width 1.2 mm. *Color:* Mostly yellow except black as follows: flagellomeres, pedicel, scape laterally, apex of mid and hind tibia, apex of midbasitarsomere, all other midtarsomeres, hind tarsus except extreme base, ovipositor sheaths, parts of terga 6–8; fore wing unevenly infusate with some areas darker than others (from almost evenly infusate, to infusate with distinct clear areas behind stigma and at base of wing, to clear except for anterior margin and apex infusate); hind wing infusate (from completely infusate, to clear in basal 2/3 and infusate distally, to infusate at midlength and clear basally and apically).

Distribution

Widespread across the Amazon, north to the Guyanas and Trinidad.

Etymology

Named in honor of Fernando Fernandez for his many contributions to insect systematics in the neotropics.

Material examined

Holotype ♀, **GUYANA**, Dubulay Ranch, 5°40.95'N, 57° 51.52'W, Malaise, Feb-May, 1999, Sharkey & Brown, (AEI). Paratypes: **BRAZIL**: ♀, Para, Baker (USNM). ♀, **GUYANA**, Dubulay Ranch, 5°40'954"N, 57° 51' 524"W, Malaise trap, April 16–23, 1999, M. Sharkey & B. Brown, DNA voucher # DM028 (HIC). **SURINAM**: ♀,

Paramaribo, Plantation Ma Retraite, Jan. 10. 1964, sweep, forest, D.C. Geijskes, (RMNH). ♀, Paramaribo, June 10–13, 1963, Malaise trap, J.v. d. Vecht, (RMNH). **TRINIDAD**: ♂, Maracas Y., July 18, 1953, [head missing], (CNCI). ♀, Asa Wright Nature Centre, Jan. 15, 1981, G. E. Bohart, (EMUS).

Note

It is remarkable that the wing pattern varies considerably in this species whereas the body color is so consistent, e.g., the dark lateral patch on the scape is found in all specimens. I have not included in my species concept specimens that are very similar morphologically but that have the apical flagellomeres yellow, nor have I included similar specimens with the median areola of the metanotum lacking a distinct posterior border. I mention this because the species limits are unclear to me.

***Austroearinus* Sharkey n. gen.**

(Fig. 1b)

Diagnosis

Austroearinus can be distinguished from all other agathidine genera with the following combination of characters: tarsal claws with a basal tooth; mesoscutum unsculptured and lacking notauli; hind coxal cavities open; propleuron without projection; ovipositor as long as or longer than metasoma.

Description

Head: Carinae on frons lacking; interantennal space lacking two prominences separated by shallow groove; gena not extended ventroposteriorly into sharp prominence; labial palp with four segments, third segment not reduced; apical antennomere acute; antennal insertion bordered anteriorly, medially, and laterally by moderately elevated ridge. *Mesosoma*: Mesoscutum smooth; notauli lacking; posteroscutellar depression absent; median areola of metanotum well defined with sharp carinae laterally and posteriorly; propodeum from completely smooth to carinate with anterior transverse carina and with pair of longitudinal carinae enclosing large medial cell; propleuron mildly convex to flat lacking ventromedial prominence; propodeal pseudosternite poorly developed and not separating hind coxal cavities from metasomal foramen. *Legs*: Foretibia lacking pegs; foretarsal claws with quadrate basal lobe; basal lobe with tuft of pectination basally (c.f. Fig. 2c); midtibia with apical and medial pegs; hind tibia with apical pegs. *Wings*: RS + M vein incomplete and not tubular throughout, though often more complete than most genera of Agathidinae (Fig. 1b); second submarginal cell triangular to weakly quadrate; 3RSb straight; hind wing r and r-m crossveins absent; CUb sometimes present as a nebulous or spectral vein. *Metasoma*: Median tergites smooth lacking sculpture; median tergite 1 with pair of longitudinal carinae diverging distally; median syntergite 2 + 3 with 1

or 2 transverse depressions, distinct grooves absent; ovipositor mildly decurved, longer than metasoma (slightly shorter than the metasoma in one species) usually as long as body.

Type species

Bassus rufofemoratus (Muesebeck) (Fig. 1b).

Distribution

New World, primarily Neotropical. One species, *Austroearinus rufofemoratus* **n. comb.**, is widespread in central and eastern USA and through Central America, but the genus is far more diverse in warm tropical areas.

Species diversity

At least two species formerly placed in other agathidine genera belong here: *Austroearinus rufofemoratus*, originally placed in *Bassus* (Muesebeck 1927), and subsequently transferred to *Earinus* (Sharkey 2004); *Austroearinus unicolor* (Schrottkey) **n. comb.**, originally placed in *Orgilus* (Schrottkey 1902), but more recently considered as a member of the genus *Bassus*. The genus is extremely species rich. I estimate there to be more than 100 species and perhaps several times this number. Many species also appear to be common, for example, there has been intensive Malaise trap sampling in La Selva, Costa Rica for more than a decade (<http://viceroy.eeb.uconn.edu/ALAS/ALAS.html>) and, of all species of Agathidinae, *A. chrysokeras* has been the most frequently collected.

Biology (Dan Janzen, pers. comm.)

A specimen of *A. rufofemoratus* from Guanacaste Province, Costa Rica, was reared from a microlepidopteran, only identified as Tortricidae, feeding on the mature leaves of *Amyris pinnata* (Rutaceae) and living in a light silk web. The wasp larva emerged from the last instar caterpillar on 6 April 2002 and spun a strong white cocoon tightly glued to the leaf surface. This is unlike other known agathidines which spin inside the caterpillar cocoon. The wasp eclosed 9 days later, which means that all of this happened in the full dry season. The site is 280 m elevation, Lat 11.04562 Long -85.45742, and locally known as Puente Mena in the Del Oro property adjacent to the north boundary of the Area de Conservacion Guanacaste. The site lies on the interface between ACG dry forests and ACG rain forest. The entire record may be found at <http://janzen.sas.upenn.edu>, refer to specimen number 02-SRNP-14223.

Etymology

From the Latin *australis* which means southern, referring to the southern distribution of this genus and its morphological similarity to *Earinus*.

Austroearinus chrysokeras Sharkey n. sp.

Diagnosis

May be distinguished from all other known members of the genus with the following combination of characters; apical 4–6 flagellomeres yellow; propodeal areola wide and well developed, ovipositor slightly shorter than metasoma.

Description

Body length: 4.6 mm. *Head:* Antenna with 31 (30–32) flagellomeres. *Mesosoma:* Scutellar sulcus with one median longitudinal carina; median areola of metanotum well defined with sharp carinae laterally and posteriorly; margin between metepimeron and metepisternum with three well defined transverse carinae; foretibia lacking pegs; midtibia with 1 subapical peg, and lacking pegs at midlength; hind tibia with 3 apical pegs; second cubital cell of fore wing sessile and triangular; RS+M vein of fore wing well developed, almost complete but not tubular at midlength; fore wing length 4.6 mm; propodeum with well defined median areola; areola wider anteriorly; anterior transverse carinae of propodeum well defined. *Metasoma:* First median tergite with 2 distinct lateral longitudinal carinae extending three-fifths the length of the median tergite; median syntergite 2+3 length 0.93mm, width 0.77 mm.; ovipositor length subequal to metasoma length. *Color:* Mostly yellow except black as follows: antenna (except apical 4–6 flagellomeres, yellow), tarsal claws, apex of hind tibia, and entire hind tarsus; wings evenly infuscate.

Distribution

Known only from Costa Rica.

Etymology

chrysos and *keras* are Greek for gold and horn respectively. The combination is a reference to the yellow tips of the antennae.

Material examined

Holotype ♀, **COSTA RICA**, Heredia Prov., 50–100m, Est. Biol. La Selva, Malaise, 10°26'N 84°01'W, 10.vii.2000, (M/19/752), (INBC).

Paratypes: **COSTA RICA:** Heredia Prov.: ♀, 50–100m, Est. Biol. La Selva, Malaise, 10°26'N 84°01'W, 7.vii.2000, (M/19/754), (INBC). ♀, 50–100m, Est. Biol. La Selva, Malaise, 10°26'N 84°01'W, 2.x.2000, (M/19/758), (INBC). 2♀, 50–100m, Est. Biol. La Selva, Malaise, 10°26'N 84°01'W, 18.Nov.2000, (M/19/757), (INBC). ♀, 50–100m, Est. Biol. La Selva, Malaise, 10°26'N 84°01'W, 30.Oct.2000, (M/19/760) (INBC). ♀, Heredia, La Selva, 50–150m, 10°26'N, 84°01'W, June 2000, [DNA voucher DM26s secondary] (HIC). ♀, Heredia, La Selva 50–150m, 10°26'N, 84°01'W, June 2000, [DNA voucher DM26], (HIC). 84♀, Heredia, La Selva 50–150m, 10°26'N, 84°01'W, with the following

dates: Feb. 1994 (2♀), Mar. 1994 (1♀), Apr. 1994 (2♀), Dec. 1995 (1♀), Nov. 1995 (2♀), Oct. 1995 (1♀), Sept. 1995 (2♀) Jan. 1996 (6♀), April 1996 (3♀), Mar. 1996 (13♀), May 1996 (13♀), June 1996 (2♀), Feb. 1996 (5♀), Mar. 1998 (4♀), Apr. 1998 (7♀), May 1998 (5♀), Feb. 1998 (1♀), Jan. 1998 (1♀), May 1993 (2♀), June 1993 (7♀), Apr. 1993 (2♀), July 1993 (5♀), Sept. 1993 (1♀) (INBC, AEI, HIC). 2♀, Prov. Limon, Sector, Cerro Cocori, Fca. de E. Rojas, 150m. May 5-June 5 1992 and April, 1992, Malaise (INBC). 2♀, Puntarenas Golfito, Est. Agujas, 300m, x.2000, Malaise, J. Azofeia, L_S_526550_276750 #60078 (INBC). 2♀, Golfito, P.N. Corcovado, Send. Sirena, 100m, viii.2000, Malaise, J. Azofeia, L_S_514200_276500 #58151 (INBC). ♀, Golfito, P.N. Corcovado, Est. Los Palos, Send. a Sirena, 70m, viii.2000, Malaise, J. Azofeia, L_S_509200_275700 #58149 (INBC). ♀, Golfito, P.N. Corcovado, E. Sirena S. Rio Claro (Parte Alta), 1–100m, ix.1991, G. Fonseca, Malaise, LS 508300 270500 #7453, (HIC).

***Austroearinus melanopodes* Sharkey n. sp.**

Diagnosis

Female. May be distinguished from all other known members of the genus with the following combination of characters: Legs excluding coxae and fore and mid tarsi, partly or entirely melanic, at least the fore femora melanic. Vertex of head melanic at least in part, contrasting with lower face and gena which are yellow. Median tergite 1 of metasoma with two sharp carinae.

Description

Female. *Body length*: 4.6 mm. *Head*: Antenna with 32 flagellomeres. *Mesosoma*: Scutellar sulcus with one median longitudinal carina; median areola of metanotum well defined, with sharp carinae laterally and posteriorly, not deeply excavated; margin between metepimeron and metepisternum with three or four weak transverse carinae; foretibia lacking pegs; midtibia with 2 subapical pegs, and two pegs at midlength; hind tibia with 7 apical pegs; second cubital cell of fore wing sessile and triangular; RS+M vein of fore wing poorly developed, mostly absent; fore wing length 4.4 mm; propodeum with long narrow median areola, not distinctly wider anteriorly, anterior transverse carinae barely indicated laterad areola. *Metasoma*: First median tergite with 2 sharp lateral longitudinal carinae extending three-fifths length of median tergite; median syntergite 2+3 length 0.94mm, width 0.67 mm; ovipositor as long as body. *Color*: Mostly yellow except black as follows: antenna, parts of frons and face, all femora and tibiae, hind coxa apicolaterally, hind trochanter, hind tarsus; wings evenly infusate.

Male. Unknown

Distribution

Known only from Costa Rica.

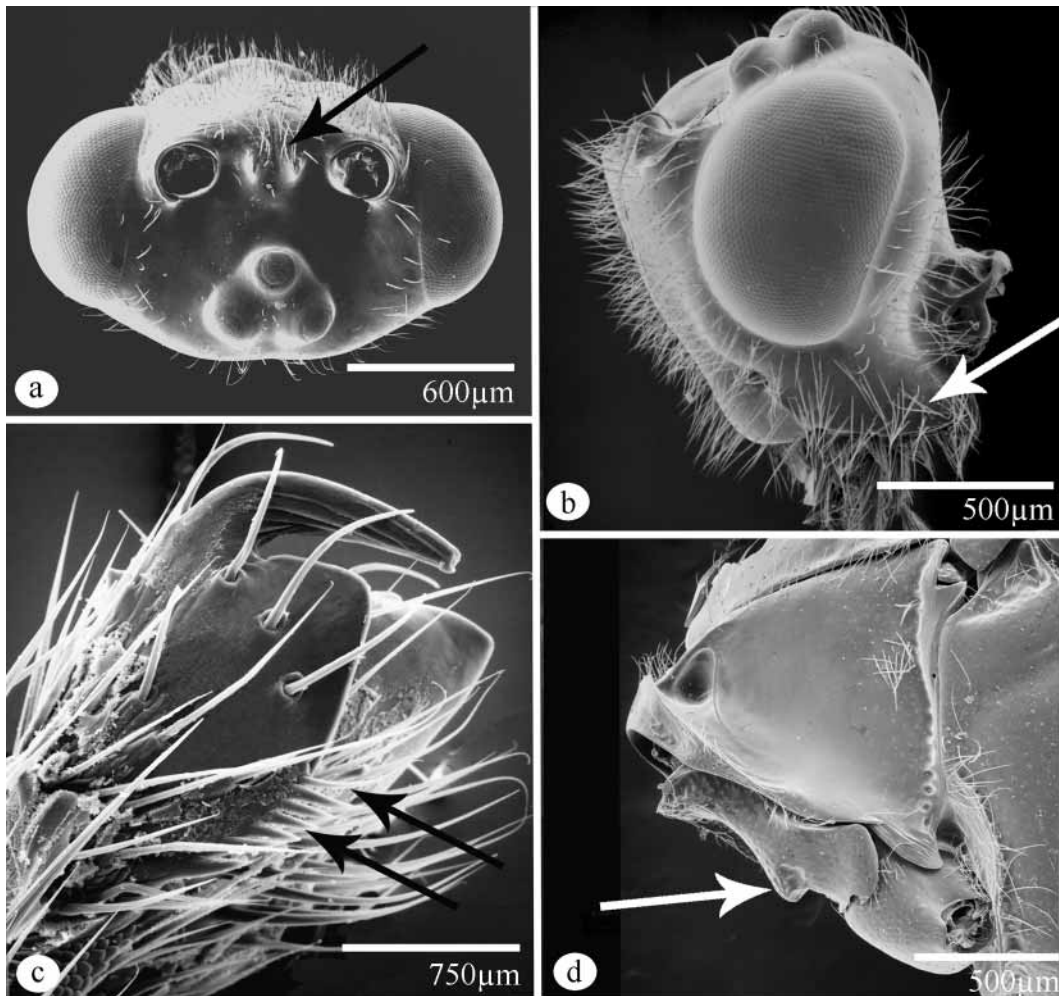


FIGURE 2. *Amputoearinus* sp. a) dorsal head. b) Lateral head showing expanded gena. c) Lateral hind claw showing basal pectination. d) Lateral prothorax showing projection on propleuron.

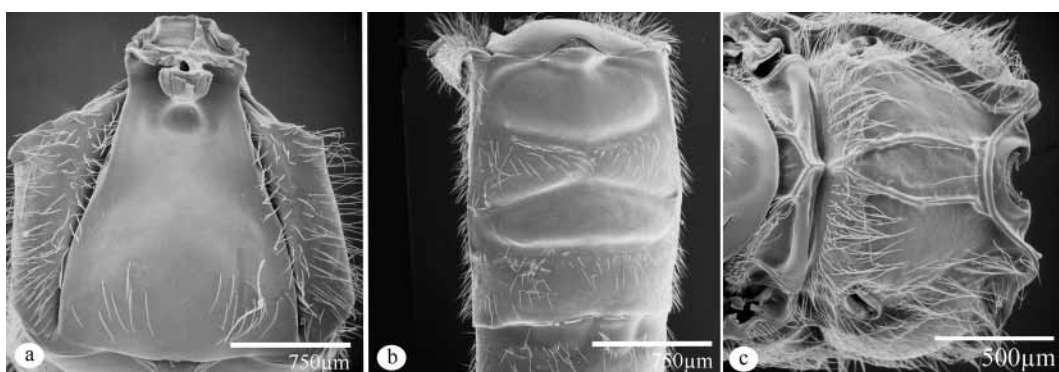


FIGURE 3. *Amputoearinus* sp. a) Dorsal metasomal tergum one. b) Dorsal metasomal syntergum 2+3 showing strong transverse grooves. c) dorsal propodeum.

Etymology

From the Greek words for black and feet, in reference to the predominately black legs that, in combination with the pale body, are distinguishing features of this species.

Material examined

Holotype ♀, **COSTA RICA**, Puntarenas Prov., Golfito, Sector Los Patos, Rio Rincón, 200m., Malaise, 22–23. Feb.2000, L_S_278700_561700_#59843, DNA voucher DM033 (INBC).

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