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A new *Anomiopus* Westwood from Peru
(Coleoptera: Scarabaeidae: Scarabaeinae)

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Abstract. Described, illustrated and discussed is a strikingly distinct **new species** of the scarabaeine genus *Anomiopus* Westwood, *A. apuskispay* Figueroa and Edmonds, from the Chanchamayo montane forest region of eastern Peru. It is a close relative of the recently described *A. pishtaco*, also from eastern Peru. Both species are noteworthy because of the bizarre form of the male clypeus, which bears extravagantly developed marginal teeth.

Key Words. dung beetles, montane forest, Chanchamayo, South America.

Introduction

The purpose of this paper is to describe a new species of the scarabaeine dung beetle genus *Anomiopus* Westwood from the Junín region of east-central Peru. It is a contribution to an ongoing study of the Peruvian scarabaeine dung beetle fauna based at the Museo de Historia Natural de la Universidad Mayor de San Marcos in Lima. In a previous paper (Edmonds and Figueroa 2013) we described what we then regarded as the most bizarre *Anomiopus* yet discovered, *A. pishtaco*. Further field studies to the west of and at a higher elevation than the type locality of *A. pishtaco* has yielded yet another unusual, arguably even more bizarre species, *A. apuskispay*, **new species**, which we describe below. The taxonomy of *Anomiopus* is the subject of a series of recent papers by the late Virgínia Luzia Canhedo (Canhedo 2004a, 2004b, 2006). Nothing is known about the biology of this new species nor that of *A. pishtaco*. Most *Anomiopus* specimens with precise collecting data were attracted to light traps of various types as well as flight-intercept traps, dung-baited pitfall traps, sweep nets, and direct capture near newly excavated nests of *Acromyrmex* Mayr (Hymenoptera; Formicidae).

Anomiopus apuskispay, new species

(Fig. 1–8, 12–14, 17)

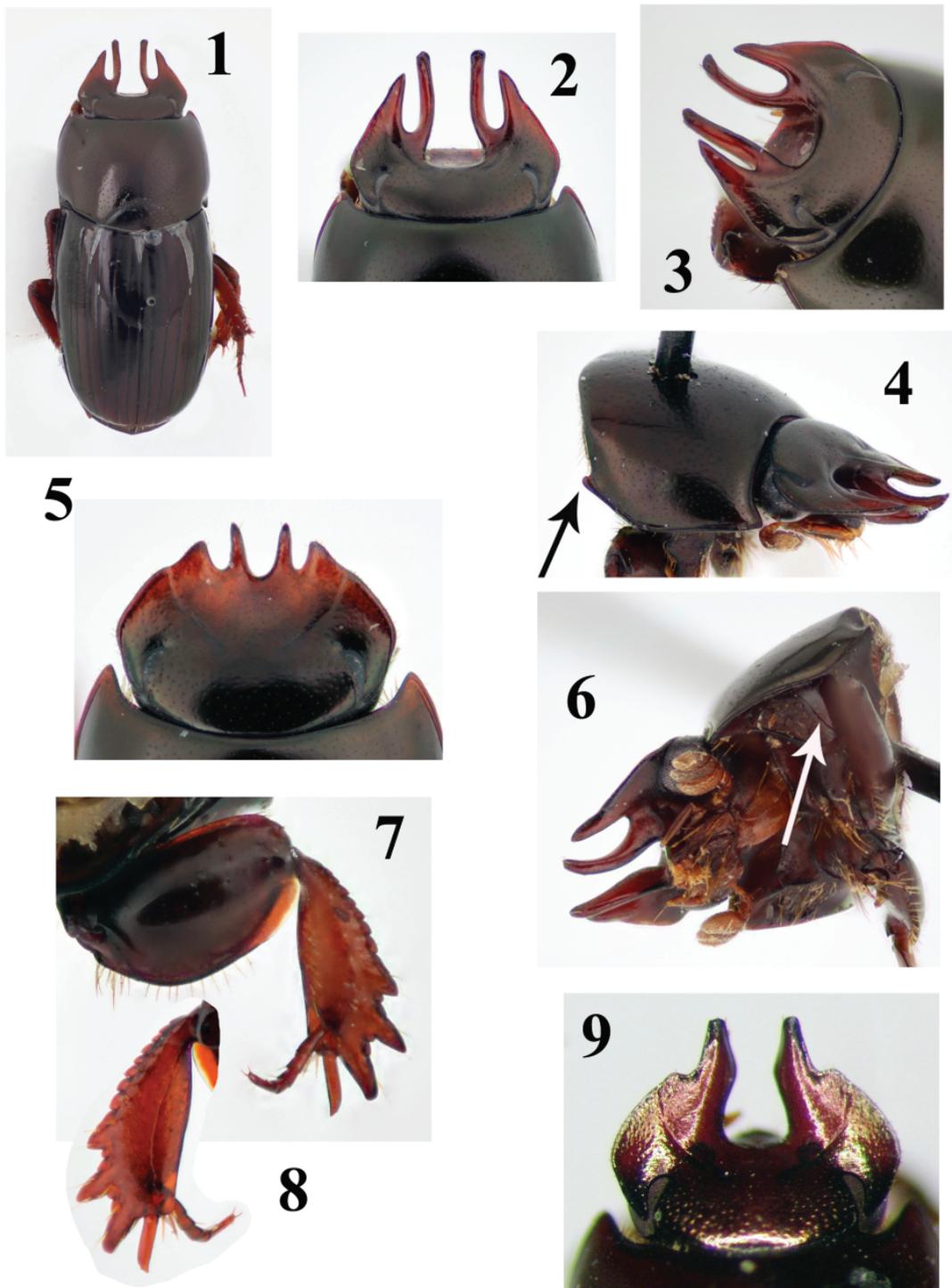
Type Series. Holotype male; five paratypes (one male, four females), all with the same collection data: PERU: Región (Departamento) Junín, Provincia Chanchamayo, Distrito Pinchanaqui, San Miguel de Autiki, 10°48'16.59"S 74°49'33.46"W; 1464 m; 02-07.vi.2014. E. Rázuri, collector. The type series is deposited in the collection of the Departamento de Entomología, Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos (Lima, Peru). All labels are in black ink on white paper bordered in red. The paratype male and one female paratype have been dismembered, the pieces each pinned and labeled separately (three in the case of the male; two in the case of the female); the holotype and three female paratypes are intact. The paratype aedeagus and abdomen are in glycerin contained in a microvial, as is the abdomen of the female paratype.

Description. Male holotype. *Color:* Dorsum (Fig. 1) shining dark chocolate brown; venter shining brown to reddish-brown, especially on legs and head. *Head:* Clypeus (Fig. 1–4) deeply excised medially for entire length, emargination broadly rounded posteriorly, strongly bifurcate laterally, each bifurcation consisting of narrow, acute, outer knife-like lobe and long, slender, ventrally bowed inner process; posterior edge of emargination separated by fine suture from ventrally directed, semicircular sclerite here interpreted as labrum (see comments below). Frontoclypeal sutures strongly arched anteriorly, together forming a semicircle; surface of head posterior to (and including) emargination strongly concave (Fig. 3–4). Clypeus lacking distinct puncturing; parietals (genae) finely punctate; frons smooth with moderate puncturing and completely margined posteriorly by fine carina. *Prothorax:* Pronotum (Fig. 1) evenly, broadly convex, completely punctate, punctures separated by at least two puncture diameters. Circumnotal ridge effaced along posterior margin, otherwise sharp and distinct; anterolateral angles acute (Fig. 2), posterior angles strongly tuberculate (Fig. 4, arrow). Secondary propleural carina (Fig. 6, arrow) present and complete, extending from middle of coxal margin to near lateral margin where it bends abruptly and extends anteriorly to merge into circumnotal ridge; pleural surface posterior to this carina smooth, finely transversely striate anteriorly. *Pterothorax:* Upper portion of metasternum, mesepimeron, metasternum and adjacent surfaces of meso- and metacoxae very finely reticulate. *Elytra:* Striae very fine, indicated by narrow lines separated by weakly convex interstriae (Fig. 14); seventh stria almost obliterated, reduced to short segment near humeral angle of elytron (Fig. 14, arrow). *Legs:* Protibia (Fig. 7–8) tridentate; teeth collectively occupying about one-half length, narrow, acute, separated by small denticles that continue along lateral margin from third tooth to base; protarsus inserted subapically on posterior (ventral) surface, longer than one-half of tibia along inner margin, claws small, only slightly curved. Profemur globose, strong carina marking both upper and lower margins. Protibial spur acute, almost straight. Meso- and metatibiae slightly widened apically; tarsomeres elongate (Fig. 17), scarcely widened apically, length of basal segment equal to combined lengths of second and third segments; claws small, only weakly curved. *Abdomen:* Length of last visible sternum (sternite) about twice that of penultimate sternum (as in Fig. 13); posterior edge of last sternum very slightly emarginate to receive apex of pygidium. *Pygidium:* Very large (as in Fig. 13), strongly convex, its greatest width about three-fourths that of combined elytral apices; dorsal margin strongly margined and angulate medially, received by upwardly curved apical elytral margins. *Aedeagus* (of paratype; that of holotype not extracted): Parameres slightly longer than phallobase, flattened laterally, apices appressed and lower angles produced as curved, claw-like hooks (Fig. 12). Body length (from pygidium to tips of clypeal teeth): ~4.5 mm. (Male paratype differs from holotype only in somewhat shorter length of clypeal processes, which does not appear to be the result of wear.)

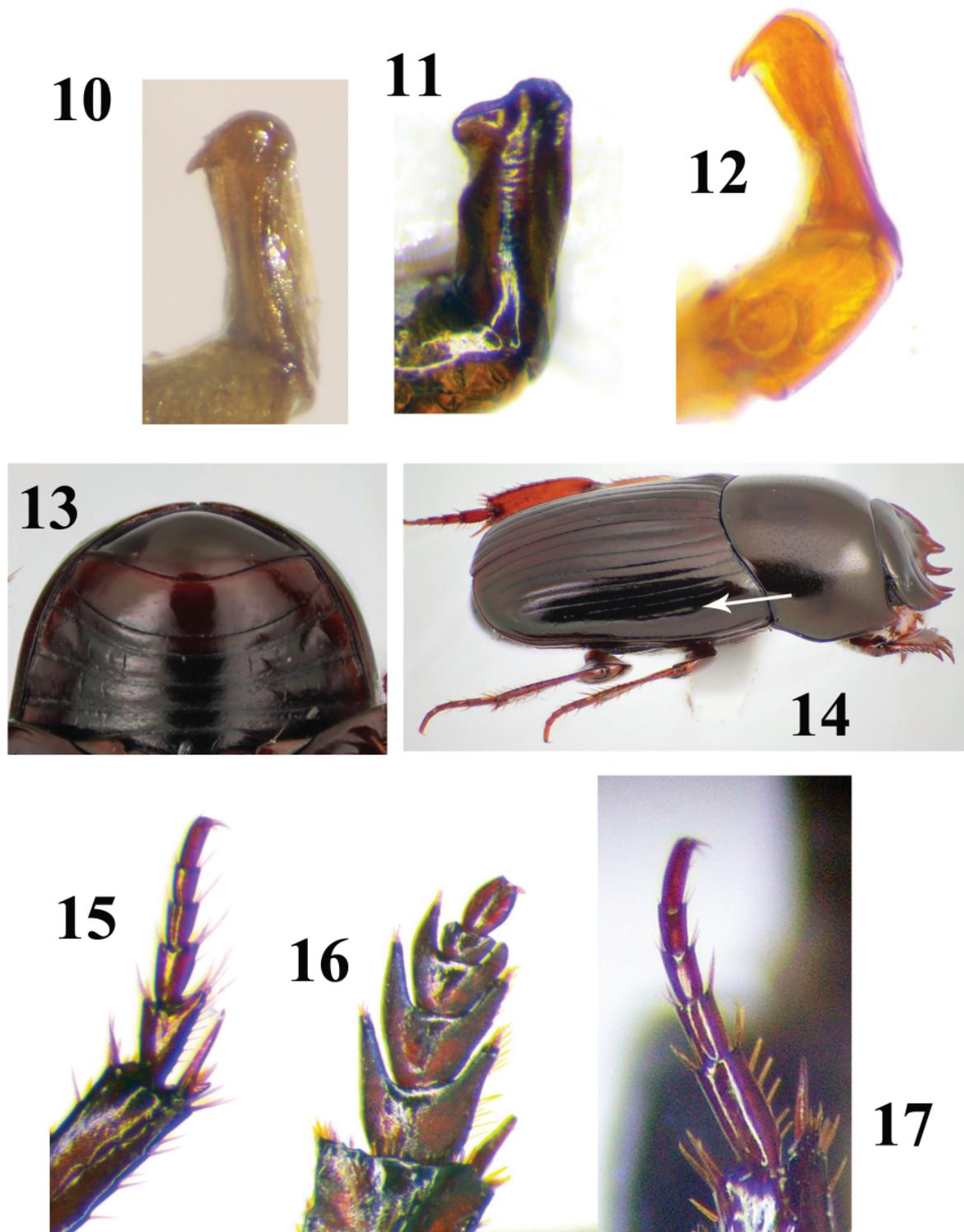
Female. Differs from male as follows: a) clypeus “normal” (Fig. 5), not grossly excised medially, but very strongly concave and quadridentate; median teeth long, narrow and acute, outer teeth acute, shorter and much wider at base than median teeth; b) last abdominal sternum not perceptibly emarginate medially (Fig. 13). Body length (including head): ~4.0 to ~4.5 mm.

Etymology. The species name ‘*apuskiipay*’ (Quechua, denoting the highest ranking field general of the Incan army; masculine noun in apposition) makes reference to the strikingly bellicose appearance of the male as metaphor for an armed warrior general.

Comments. This new species is a member of Canhedo’s (2006) cuprarius species group, characterized by the following character set (modified from Canhedo 2006): a) propleural carina complete, extending from the coxal cavity to the lateral margin of pronotum (Fig. 6, arrow); b) narrow, parallel-sided meso- and metatarsal segments, length of basal segment approaching or equaling combined lengths of second and third (Fig. 17); c) pronotum and posterior portion of head covered with small, disperse punctures mostly separated by at least two diameters (Fig. 3, 14); d) long, narrow, almost parallel-sided meso- and metatibiae; and e) clearly quadridentate clypeal margin (only weakly so in *A. foveicollis*, grossly so in males of *A. pishtaco* and *A. apuskiipay*, Fig. 2, 5, 9). The combined distribution of the now 10 species comprising the cuprarius group embraces the western - northwestern belt of the Amazonia subregion (sensu Morrone 2001) from southern Peru to northern Venezuela and Guyana, with two species (*A. cuprarius* and *A. panamensis*) occupying the southern Mesoamerican subregion (northwest Colombia, Panama and Costa Rica). The remaining two species groups (virescens group with 21 species



Figures 1–9. Two species of *Anomiopus*. 1) *Anomiopus apuskispay*, new species, holotype male, habitus, dorsal view. 2) Same, forebody, dorsal view. 3) Same, forebody, oblique dorsal view. 4) Paratype male, partial pronotum, dorsal view (arrow indicates tuberculate posterior pronotal angle). 5) Paratype female, head and anterior margin of pronotum, dorsal view. 6) Paratype male, head and prothorax, oblique ventral view (arrow indicates prosternal carina). 7) Same, proleg, posterior (ventral) view. 8) Same, protibia and tarsus, anterior (dorsal) view. 9) *Anomiopus pishtaco* Edmonds and Figueroa, holotype male, dorsal view of head.



Figures 10–17. 10) *Anomiopus pishtaco* Edmonds and Figueroa, aedeagus, lateral view. 11) *A. smaragdinus* (Westwood), same. 12) *A. apuskispay*, new species, same. 13) Same, female abdomen, ventral view. 14) Same, female, lateral view (arrow indicates abbreviated seventh stria). 15) *A. smaragdinus*, tip of hind tibia and metatarsus. 16) *A. validus* Canhedo, same. 17) *A. apuskispay*, same.

and smaragdinus group with 30; Canhedo 2004a, 2004b, 2006) are distributed widely throughout the Amazonian, Paranaian and Chacoan subregions of South America (sensu Morrone 2001).

The following emendation of our 2013 key, itself based on Canhedo's (2006), will separate *A. apuskispay* from its known congeners:

1. Lateral margin of metatibia simple, not interrupted by teeth or carina **2**
 — Metatibia with one or more transverse teeth on lateral margin.
 **(virescens species group, Canhedo 2006: 362)**

- 2(1). Transverse propleural carina complete (Fig 4, arrow), reaching lateral margin and turning anteriorly to border episternum. Apices of metatarsomeres 1–4 transversely truncated (Fig. 17). (cuprarius group) **3**
 — Transverse propleural carina semi-complete (reaching lateral margin but not turning anteriorly to border episternum) or incomplete (not reaching lateral margin). At least basal (often all) metatarsomere emarginate (Fig. 16) or obliquely truncate (Fig. 15) apically.
 **(smaragdinus species group; Canhedo 2006: 359)**

- 3(2). Clypeus of male deeply excised medially; sides of emargination drawn out as knife-like projections (Fig. 9) or strongly bifurcate process (Fig. 2); labrum exposed as sclerite projecting downward from base of clypeal emargination. Female clypeus deeply quadridentate (*A. apuskispay*, Fig. 5; female unknown in *A. pishtaco*). Parameres bearing apical, claw-like teeth (Fig. 10, 12). **4**
 — Clypeal emarginations small, medial teeth of male not prolonged; labrum not exposed. Female clypeus, if quadridentate, only weakly so. Parameres with apical lobe-like projections or unarmed (Fig. 11)
 **(to couplet 1 of Canhedo 2006 key to species of the cuprarius group [p. 359])**

- 4(3). Clypeus of male as in Fig. 9, median teeth knife-like; labrum triangular. Posterior pronotal angle rounded, not strongly tuberculate. Female unknown.
 ***Anomiopus pishtaco* Edmonds and Figueroa**
 — Clypeus of male as in Fig. 1–3, median teeth rod-like; labrum semicircular. Posterior pronotal angle strongly tuberculate (Fig. 4). Female clypeus strongly and deeply quadridentate (Fig. 5) ***Anomiopus apuskispay*, new species**

Anomiopus apuskispay morphologically appears to be very closely related to *A. pishtaco*. Its signature characteristic is the shape of the clypeus, bizarrely armed in the male (Fig. 1–3) and very strongly quadridentate in the female (Fig. 5). We have yet to discover the female of *A. pishtaco*, but we are inclined to believe that its clypeus, like that of *A. apuskispay*, will be strongly quadridentate. The type series of this new species was collected by flight intercept trap in the Chanchamayo montane forest (almost 1500 m) approximately 300 km southwest of and 1300 m higher than the type locality of *A. pishtaco*. The configuration of the projections of the male clypeus, with the slender median processes bowed below the outer two, suggests a shallow basketlike device suited for scooping or carrying something, such as a fragment of food. In addition, the clypeus could well be employed in male combat. The clypeus of the female is likewise strongly concave, with the marginal teeth curving upward to produce the appearance of a cupped hand with fingers curved upward (Fig. 5, 14). The female clypeal dentition is much more strongly developed than in any other known congener. The Argentine genus *Anomiopsoides* has a similarly modified clypeus, with which adults have been observed to separate fragments of food (dried excrement and leaves) that are carried to their burrows using the front legs, and as weapons during male combat (Federico Ocampo, pers. comm.).

Canhedo (2004a,b; 2006) made no reference to the aedeagus of *Anomiopus* in her treatments of the genus. Moreover, in our description of *A. pishtaco* (Edmonds and Figueroa 2013), we refrained from dissecting either of the two type specimens. We here compare the aedeagus of *A. apuskiskay* (Fig. 12) with that of *A. pishtaco* (since extracted from the paratype; Fig. 10) and *A. smaragdinus* (Fig. 11). The only previous illustrations of aedeagi that we are aware of are those from Martínez (1952, 1955 [as *Onthocharis*]) for *A. ataenioides*, *A. juanae*, *A. germani* (as *O. wittmeri*) and *A. nigrocoeruleus*. In the

first two species, the parameres bear apical hooks somewhat similar to those of *A. apuskispay* and *A. pishtaco*. The latter two each have a unique shape lacking apical hooks. Neither *A. smaragdinus* nor any of the four species illustrated by Martínez are members of the cuprarius species group.

This new species brings to 13 the total number of *Anomiopus* species known by us to inhabit Peru. The following list of Peruvian taxa is based primarily on Canhedo (2004a, b; 2006) and records present in the collection of the Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos in Lima; known regional (departmental) distribution is indicated [in brackets].

***Anomiopus* Westwood, 1842**

cuprarius species group (Canhedo, 2006)

Anomiopus foveicollis Canhedo, 2006 [Madre de Dios; Huánuco]

Anomiopus pishtaco Edmonds and Figueroa, 2013 [Ucayali]

Anomiopus apuskispay Figueroa and Edmonds, 2014 [Junín]

smaragdinus species group (Canhedo, 2006)

Anomiopus validus Canhedo, 2006 [Loreto, Huánuco]

Anomiopus ideii Canhedo, 2006 [Loreto]

Anomiopus cambeforti Canhedo, 2006 [Cuzco]

Anomiopus smaragdinus (Westwood, 1842) [Madre de Dios]

Anomiopus batesi (Waterhouse, 1891) [Madre de Dios]

virescens species group (Canhedo, 2006)

Anomiopus brevipes (Waterhouse, 1891) [Loreto, Madre de Dios, Ucayali, Junín, Puno, Cuzco]

Anomiopus intermedius (Waterhouse, 1891) [Huánuco, San Martín, Cuzco, Loreto]

Anomiopus andrei Canhedo, 2006 [Madre de Dios]

Anomiopus gilli Canhedo, 2006 [Loreto]

Anomiopus pictus (Harold, 1862) [Madre de Dios, Junín, Puno]

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