

New species of dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) from Mexico and Costa Rica

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Abstract

The following new species of dung beetles (Coleoptera: Scarabaeidae) are described: *Canthidium margaritae* **sp. nov.** from Mexico and *Canthon inusitatus* **sp. nov.** from Costa Rica. Illustrations of the dorsal habitus and distribution maps are provided for both species.

Key words: Coleoptera, Scarabaeidae, *Canthidium*, *Canthon*, new species, Mexico, Costa Rica

Resumen

Las siguientes especies nuevas de escarabajos estercoleros (Coleoptera: Scarabaeidae) se describen de México y Costa Rica: *Canthidium margaritae* **sp. nov.** y *Canthon inusitatus* **sp. nov.** Se incluyen ilustraciones del hábito dorsal de las dos especies, así como sus respectivos mapas de distribución.

Introduction

In this paper we describe *Canthidium margaritae* **sp. nov.**, a species that inhabits cloud forest mixed with oaks in the Mexican state of México, between 1,750 and 1,800 m above sea level. We also describe *Canthon inusitatus* **sp. nov.**, a species that inhabits cloud forests (lower montane rain forest according to the Holdridge life-zone system [1967]) in the Costa Rican province of Heredia, at 2000 m above sea level. These new species bring the total number of Mexican *Canthidium* species to 14 (see Kohlmann and Solís 2006) and the Costa Rican *Canthon* species to 21 (see Solís and Kohlmann 2002).

Measurements were made to the nearest 0.1 mm using an ocular micrometer. The holotype and five paratypes of *C. margaritae* are deposited in the Institute of Ecology collection (Leonardo Delgado) in Xalapa, México, and two paratypes are deposited in the

Canadian Museum of Nature in Ottawa; the holotype of *C. inusitatus* is deposited in the National Biodiversity Institute (INBio) in Santo Domingo de Heredia, Costa Rica.

***Canthidium margaritae* Kohlmann & Solís sp. nov. (Figs. 1–3)**

Diagnosis. This species is distinguished by the following combination of characters: body globose; head and pronotum uniformly and strongly punctate; frons swollen; fronto-clypeal region with a small, smooth swelling medial to each eye; eye dorsally at posterior end of gena narrow, eight to ten facets wide, interocular distance separated by approximately 8–10 times maximal eye width; basal pronotal border not margined; elytra with eight striae, surface lightly shagreened, microsculpture coarser towards apex; hind wing brachypterous.

Description of Holotype. Male. Length: 4.5 mm, humeral width: 2.9 mm. Body form globose (Fig. 1). Head and pronotum coppery-red, elytra dark brown (Fig. 1). Head and pronotum strongly punctate and devoid of setae.

Clypeus rugosely punctate, apex strongly bidentate, median emargination broadly V-shaped (Fig. 2a); eye dorsally at posterior end of gena narrow, eight to ten facets wide, eyes separated by approximately 8–10 times maximum eye width (Fig. 2a). Frons and vertex of head strongly punctate, frons swollen; two small, black, smooth swellings between eyes (Fig. 2a).

Pronotum on disc and posterior angles slightly shagreened; surface strongly and uniformly punctate; lateral fovea oval; posterior margin lacking elongated punctures or groove.

Elytral striae consisting of clear indented lines interrupted by fairly evenly spaced oval punctures (approximately the maximum length of one puncture); intervals shiny, finely punctate; surface shiny and slightly shagreened especially towards apex. Elytra globose; hindwing brachypterous (Fig. 2h).

Pygidium distinctly punctate, more coarsely so in basal half, surface shiny and slightly shagreened at base. Genitalia as in Fig. 2g.

Protibia with three teeth on external border (Fig. 2c), inner apical margin of protibia produced into a rounded anterior projection and slightly bent downwards (Fig. 2c), apical spur with incurved apex (Fig. 2c). Pro-, meso- and metafemora with ventral surface finely punctate and finely shagreened.

Allotype. Female. Length: 4.6 mm, humeral width: 3.1 mm. Differing from male in the following major characters: clypeus slightly more transversely rugose (Fig. 2b), apical spur not forming incurved apex and claw-bearing protarsus not as thick (Fig. 2d), pygidium broader and less heavily punctate (Fig. 2f), last abdominal segment broader, inner apex of protibia not forming a rounded lobe (Fig. 2d).

Variation. Elytral surface can range from completely shagreened to shagreened only on the apical third.

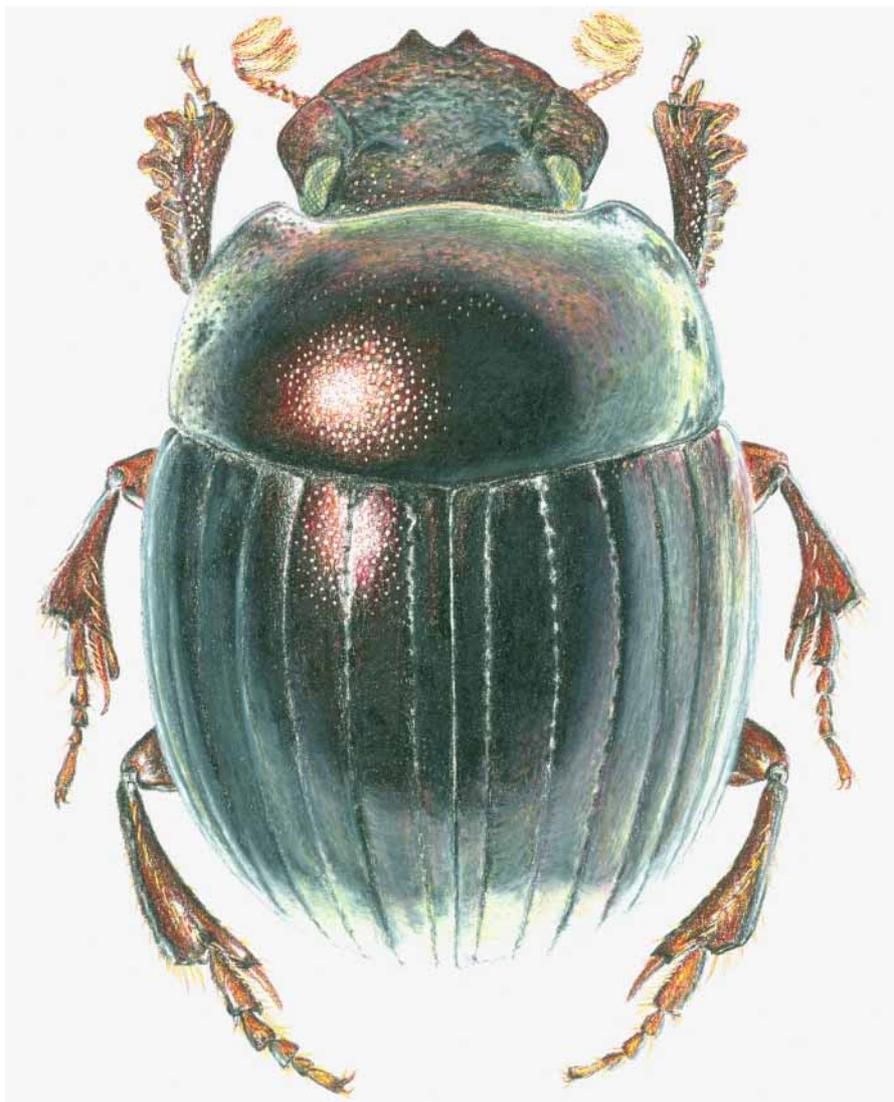


FIGURE 1. Dorsal view of male *Canthidium margaritae*.

Material examined (8 specimens). **Holotype** male: MÉXICO. Estado de México. Sierra de Nanchititla, Palos Prietos, 28–29-julio-2005, Alt. 1750 m, copotrampa, M. Castillo, A. y L. Delgado cols. **Allotype** female: *ibidem*. Paratypes: MÉXICO. Estado de México. Sierra de Nanchititla, 18–19-VIII-96, 1800 msnm, G. Nogueira col., (1 female); same data as holotype (4 males, 1 female).

Habitat. This species has been found in cloud forest mixed with oaks in elevations ranging from 1,750 to 1,800 m above sea level.

Geographical distribution. It is only known in the State of México in the Sierra de Nanchititla on the upper reaches of the Balsas river depression (Fig. 3).

Chorological affinities. The known range of *Canthidium margaritae* is widely

separated from that of a very similar species, *C. riverai*, which is distributed in the Manantlán (Jalisco State) and the Coacolmán (Michoacán state) mountain ranges at similar altitudes (960–2,000 m above sea level) and in cloud forests.

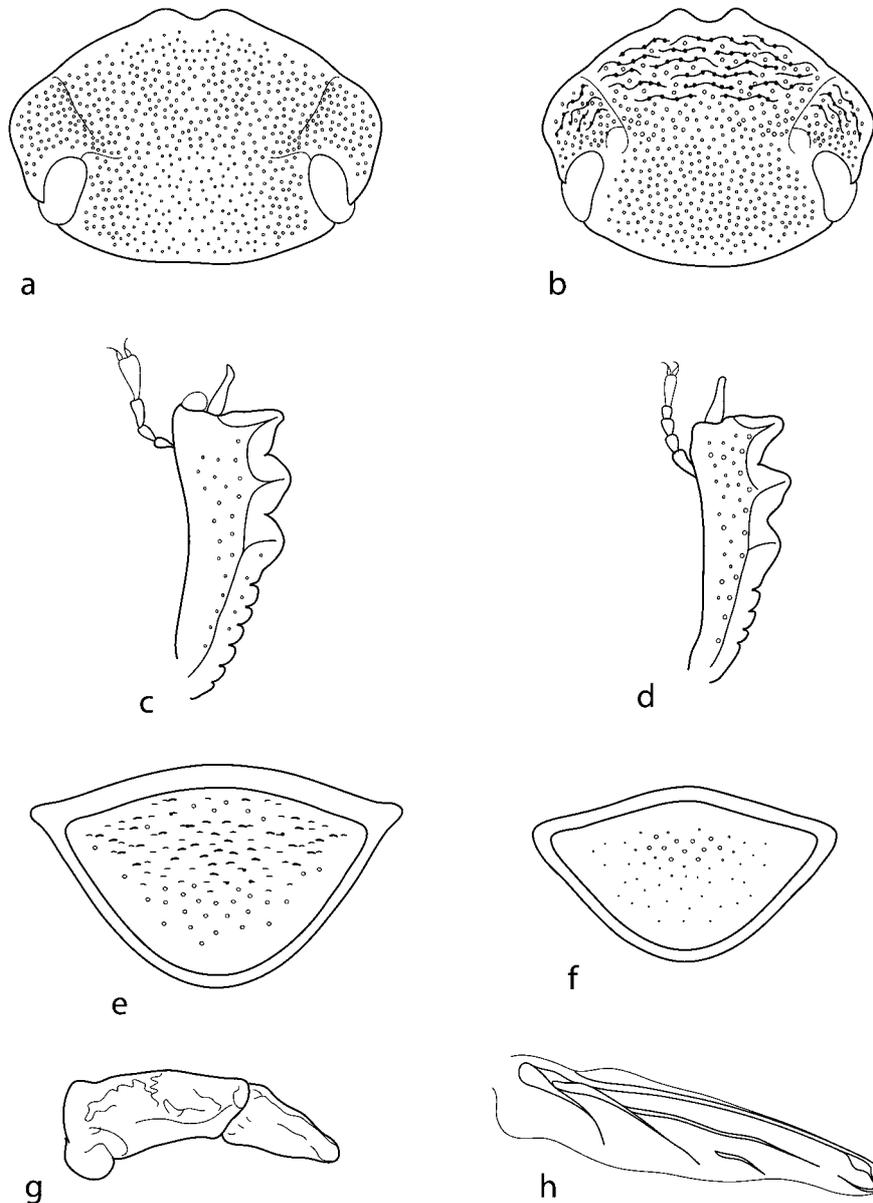


FIGURE 2. *C. margaritae*. a) Dorsal view of male head; b) dorsal view of female head; c) dorsal view of right male protibia; d) dorsal view of right female protibia; e) male pygidium; f) female pygidium; g) lateral view of aedeagus; h) dorsal view of brachypterous right wing of male.

Taxonomic relationships. *Canthidium margaritae* is postulated to be the sister species of *C. riverai*. They are both globose in body shape and brachypterous, they also

have a swollen frons, clearly punctate pronotum, shagreened elytra, evenly impressed striae, and they both inhabit cloud forests. This species pair apparently represents a vicariant speciation event between the Sierra Madre del Sur (*C. riverai*) and the Neovolcanic Axis (*C. margaritae*).

C. margaritae will key to *C. riverai* Kohlmann and Solís in couplet 12 in the Kohlmann and Solís (2006) key for the *Canthidium* of Mexico. The two species are very similar, but *C. margaritae* can be easily separated from *C. riverai* by having bigger eyes (8–10 eye facets versus 2–3 eye facets), head and pronotal punctures less coarse, elytra less shagreened, a different metatibial form (internal apical angle projected like a tapering rectangle versus apically obliquely truncated), and differences in the form of the parameres (parameres taper evenly towards apex versus parameres with a small hump at apical two-thirds).

Etymology. We dedicate this species to Margarita Castillo, who has always supported Luis Leonardo Delgado in his entomological studies and also helped collect this new species. The name is derived from the latinized (*margarita*) Greek word μαργαρίτης, meaning a pearl.

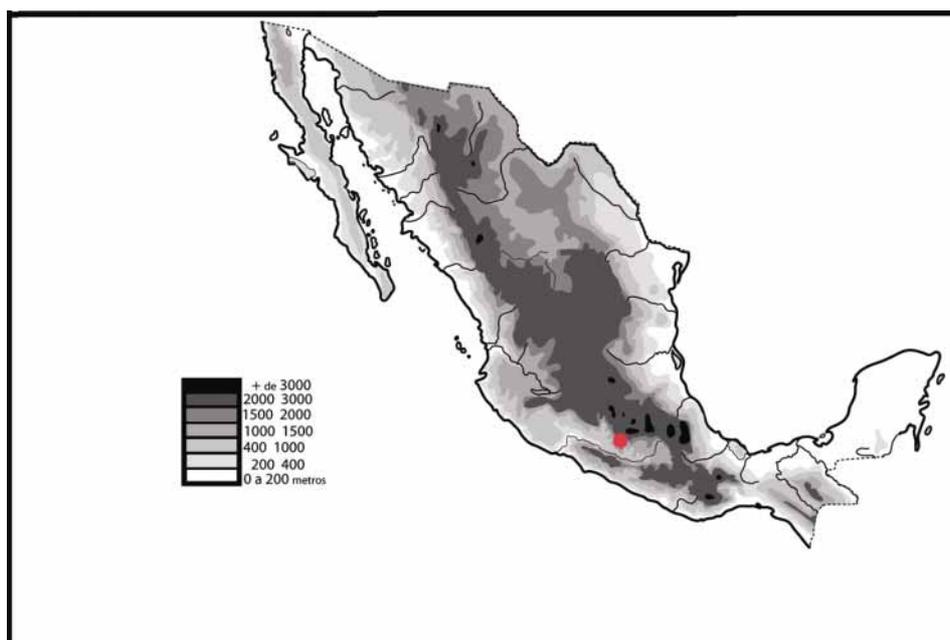


FIGURE 3. Known distribution of *Canthidium margaritae* in Mexico.

***Canthon inusitatus* Kohlmann & Solís, sp. nov. (Figs. 4, 5)**

Diagnosis. This species is distinguished by the following combination of characters: body oval, convex, black; dorsal surface shagreened; legs dark brown with a reddish hue. Posterior border of head clearly margined; second labial palpomere smaller than first;

mentum entire; thorax strongly transverse; elytra not carinate; meso- and metatibiae lacking transverse carinae; meso- and metatarsomeres narrow and elongate, distal four tarsomeres as a group parallel-sided or nearly so, first tarsomere very small, its length about half that of second; metatibial spur spinose and sharp.

Description of holotype. Male. Length: 7.9 mm, humeral width: 5.9 mm. Body oval and convex, completely black; dorsal surface shagreened.

Head with surface smooth, with fine punctures; posterior border of head clearly margined, margin with punctation at regular intervals; antenna brown, club grayish-brown. Clypeus anteriorly bidentate (Fig. 4), with a V-shaped emargination between teeth. Eyes small, dorsally only 7 facets wide and approximately twice as long as wide, separated by approximately 36 times their dorsal width (Fig. 4).

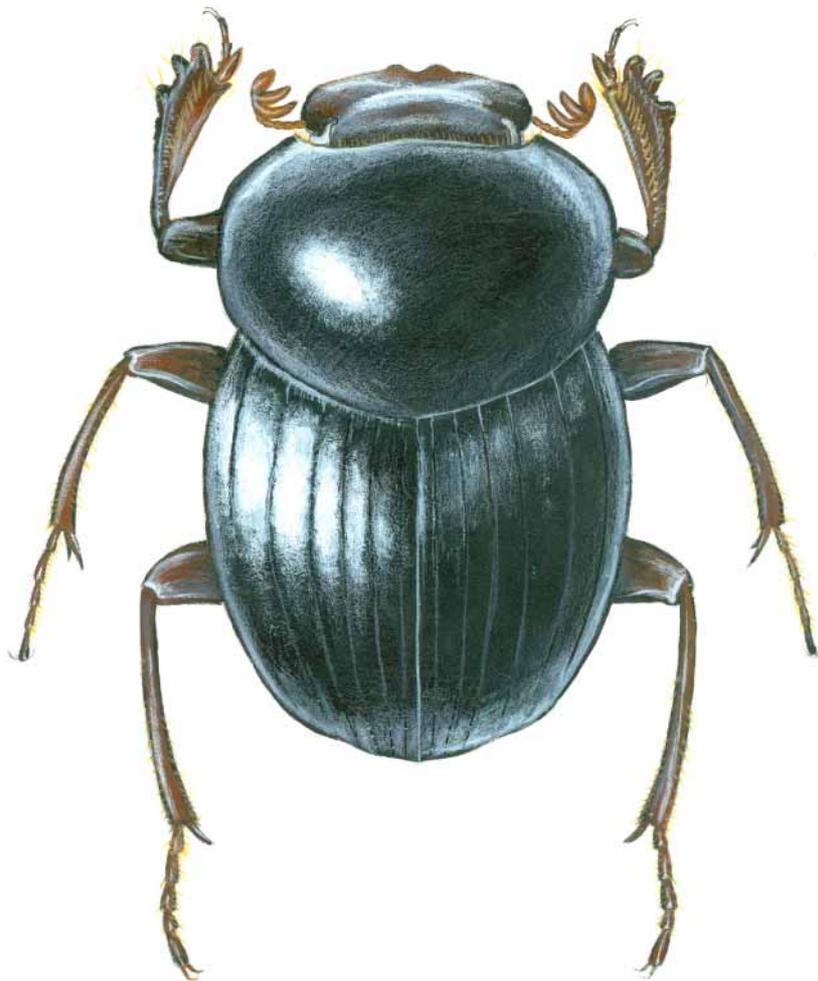


FIGURE 4. Dorsal view of male *Canthon inusitatus*.

Thorax much wider than long (Fig. 4); anterior angles well developed and acute; lateral borders forming angled arch; posterior angles poorly defined; anterior and lateral

borders margined; disc very convex, finely punctured; without evident prescutellar impression. Prosternum with proepimeral carina absent.

Elytra with striae nearly obsolete and finely punctate; interstriae shagreened, finely punctate, convex.

Pygidium large (3.5 mm width versus 3.6 mm head width) and triangular; base not margined; disc convex, finely punctate.

Protibia with three teeth on external edge, the apical tooth broadened towards apex with slender, acute apical spur (Fig. 4); ventral surface of metafemur lacking lines adjacent to posterior margin; metatibia slender and curved; meso- and metatarsi long and slender, first tarsal article clearly shorter than second (Fig. 4); basal one-third of metafemur slender.

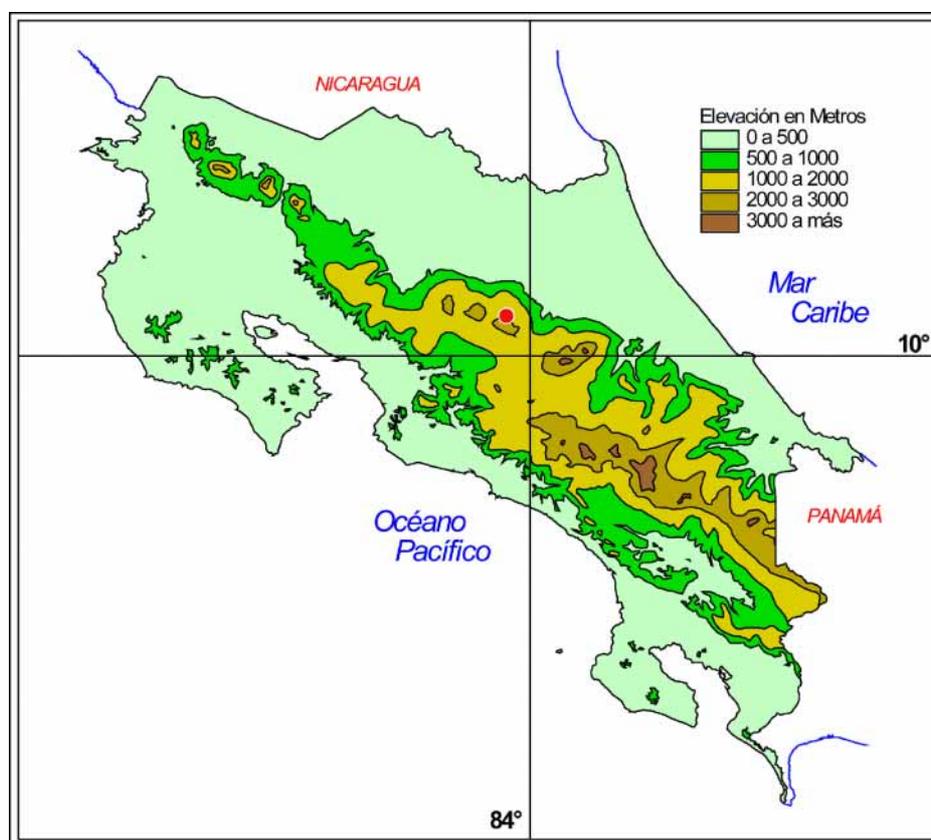


FIGURE 5. Known distribution of *Canthon inusitatus* in Costa Rica.

Female. Unknown.

Material examined (1 specimen). Holotype male: COSTA RICA. Heredia. 6 km ENE Vara Blanca, 2000 m, 13 abril 2002, 20/TF/05, D. Brenes, M. Paniagua y R. Vargas.

Habitat. The species was collected in cloud forest (lower montane rain forest according to the Holdridge [1967] life zone system).

Geographical distribution. This species is known only from the Caribbean slope of the Central Cordillera of Costa Rica (Fig. 5).

Chorological affinities. The distribution of this new species represents, together with *C. moniliatus*, the northernmost distribution of the members of the “*Scybalocanthon*” group.

Taxonomic relationships. *Canthon inusitatus* seems to have a number of different characters from the other species of the “*Scybalocanthon*” group, which Medina *et al.* (2003) have concluded is an artificial group. *Canthon inusitatus* will key to *C. moniliatus* Bates in couplet 8 in the Solís and Kohlmann (2002) key to the *Canthon* of Costa Rica. However, these two species differ in several characters and *C. inusitatus* can be easily separated from *C. moniliatus* by color (body all black versus head and elytra black and pronotum yellow-brown), male protibial spur (broad versus slender), and femoral color (unicolored versus black and yellow).

Etymology. The word *inusitatus* is a Latin adjective in the nominative singular case, meaning unusual or extraordinary, in reference to such a big species having been found in such an unusual place for a *Canthon*, a cloud forest, after more than fifteen years of systematic collections in the area.

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References

- Holdridge, L. (1967) *Life Zone Ecology*. Tropical Science Centre, San José, Costa Rica, 124 pp.
- Kohlmann, B. & Solís, A. (2006) El género *Canthidium* (Coleoptera: Scarabaeidae) en Norteamérica. *Giornale Italiano di Entomologia*, 53 (11), 235–295.
- Medina, C.A., Scholtz, C.H., & Gill, B.D. (2003) Diagnostic and phylogenetic character variation in the genus *Canthon* Hoffmannsegg 1817 and related genera (Coleoptera: Scarabaeidae: Scarabaeinae). *Deutsche Entomologische Zeitung*, 50 (1), 23–68.
- Solís, A. & Kohlmann, B. (2002) El género *Canthon* (Coleoptera: Scarabaeidae) en Costa Rica. *Giornale Italiano di Entomologia*, 50 (10), 1–68.