



A new species of *Hintonelmis* Spangler (Coleoptera: Elmidae: Elminae) from Central Amazonia, Brazil

ANDRÉ S. FERNANDES^{1,4}, MARIA INÊS S. PASSOS² & NEUSA HAMADA³

Instituto Nacional de Pesquisas da Amazônia, Divisão de Curso em Entomologia, Caixa Postal 478, CEP 69011-970 Manaus, AM, Brazil. E-mail: ¹andrelmis@gmail.com, ³nhamada@inpa.gov.br

Universidade Federal do Estado do Rio de Janeiro, Departamento de Zoologia. Av. Pasteur, 458 - 4o. andar, CEP: 22290-240, Urca, Rio de Janeiro, RJ, Brazil. E-mail: ²minespasos@gmail.com

⁴Corresponding author

Abstract

Hintonelmis anamariae sp. nov. is described and illustrated based on adult specimens collected in Presidente Figueiredo Municipality, Amazonas State, Brazil. This species can be distinguished from all other known *Hintonelmis* species by its dorsal color pattern and the morphology of the male genitalia.

Key words: Elmidae, morphology, Neotropics, riffle beetle, taxonomy

Introduction

The Neotropical genus *Hintonelmis* Spangler, 1966, was created based on a single species, *Hintonelmis sandersoni*, found in Peru. Later, Delève (1970) transferred the species *Ancyronyx perfectus* Grouvelle, 1908, collected in French Guiana, to the genus *Hintonelmis*. Finally, Hinton (1971) published a revision and a taxonomic key to the genus, including *H. perfectus* and eight new species collected by him in Brazil and French Guiana in 1937. Since Hinton did not examine the one type specimen of *H. sandersoni*, he did not include this species in his revision and key (Hinton, 1971). Until now, ten species are known in the genus, all from northern South America (French Guiana, Peru and northern Brazil); seven of these species occur in Brazil (Hinton, 1971). However, Shepard (pers. com., 2009) found specimens of *Hintonelmis* from Paraguay, which indicates that the real distributional range of the genus is much wider, extending beyond Amazonia, and could possibly occur, therefore, the length of South America. The larva of the genus is still unknown.

Hintonelmis can be distinguished from other Neotropical elmid genera by the presence of the following characteristics: pronotum with sublateral carinae or sulci limited to the basal third or absent; each elytron with two carinae, one on the basal half (inner, on sixth interval) and the other on the apical half (outer, on eighth interval), (in *H. sandersoni* and *H. sul* Hinton, 1971, these intervals are not carinate); tibiae with distinct apical fringes of tomentum, two fringes (anterior and posterior margin) on the front and middle tibiae and one fringe (posterior margin) on the hind tibiae; last tarsal segment twice as long as the four basal segments combined; fine plastron present on the genae, the anterior part of the hypomera, the epipleura, the lateral margin of the prosternum, the lateral margin of the metasternum, the sternites of the abdomen (except the discal area of the first one, two or three sternites), on the femora and sometimes on the trochanters and tibiae (Spangler, 1966; Delève, 1970; Hinton, 1971).

In this paper, we describe and illustrate a new species of *Hintonelmis* from a small stream in *terra firme* (upland) forest, in Presidente Figueiredo County, Amazonas State, northern Brazil.

Materials and methods

The type series, collected by Dr. Ana M. O. Pes, was taken using blacklight traps placed along streams with 80% ethanol as a preservative. Morphological terminology follows Hinton (1940) and Brown (1972). Some of the specimens were dried and pinned, while the remaining specimens were preserved in 80% ethanol. Dissected genitalia were stored in microvials with glycerin and maintained with the same vial or pin as the body of the adult from which they were removed.

The holotype and paratypes are deposited in the Coleção de Invertebrados, Instituto Nacional de Pesquisas da Amazônia, (INPA) Amazonas State (AM), and in the Coleção Entomológica José Alfredo Pinheiro Dutra, Instituto de Biologia, Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro (RJ), Brazil.

Results

Hintonelmis anamariae sp. nov.

(Figs. 1–9)

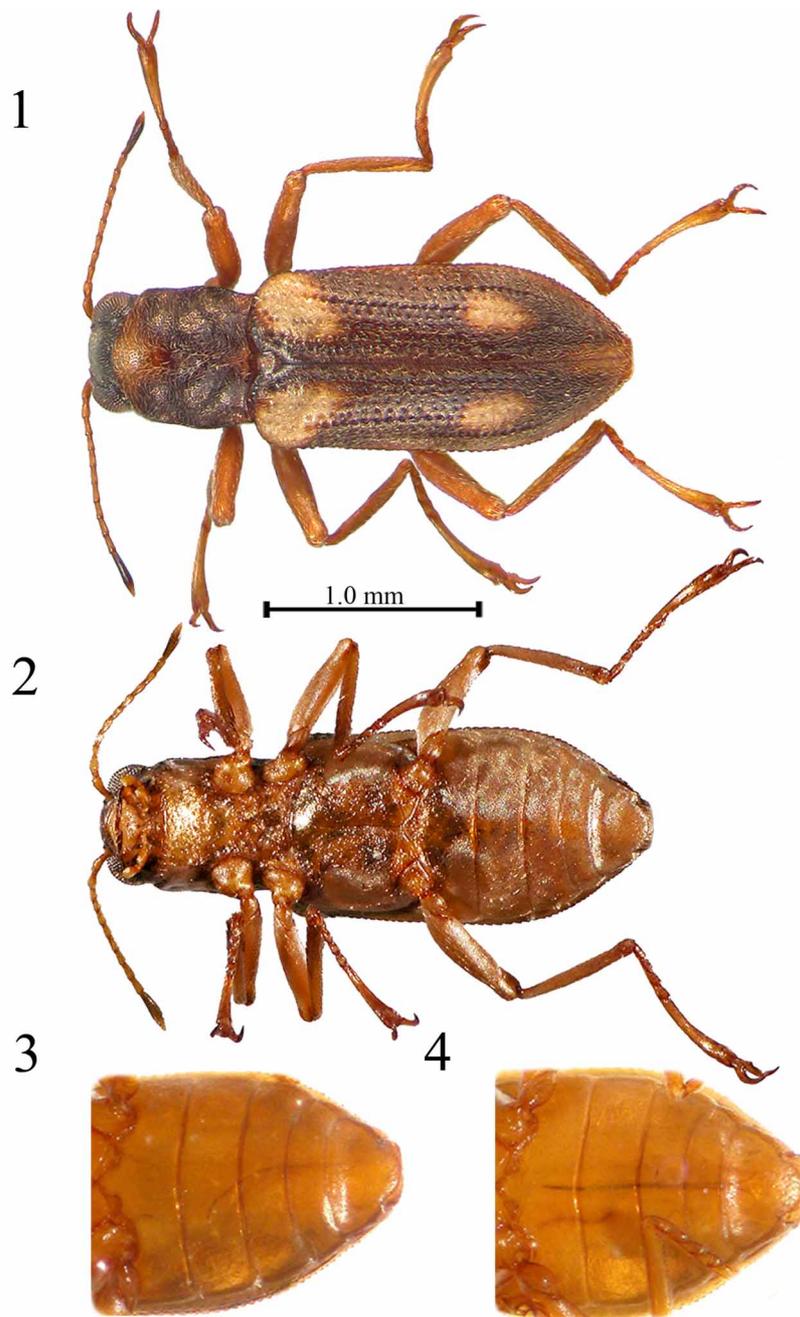
Diagnosis. *Hintonelmis anamariae* sp. nov. can be distinguished from all other species in the genus by the combination of the following characteristics. 1) Pronotum (Fig. 1) dark brown with anteromedial portion yellowish brown. 2) Elytra (Fig. 1) dark brown; each elytron with two oval, yellowish brown, patches - one larger patch extending diagonally from umbo to second stria at the basal 1/5, and one smaller oval medial patch at apical 2/5. 3) Antennae (Figs. 1, 2) yellowish brown, with basal 3/4 of last segment dark brown. 4) Parameres (Figs. 7, 8) elongate; in dorsal view (Fig. 7), continually narrowed to apex, apex acute; in lateral view (Fig. 8), continually narrowed and curved to venter beginning at 1/3 posterior; anterior 1/10 continually spatulated; apex truncate. 5) Median lobe (Figs. 7, 8) longer than parameres; in dorsal view (Fig. 7), continually narrowed to apex, apex subacute; in lateral view (Fig. 8), curved and narrowed from anterior 1/8 to apex; apex rounded.

Description. Holotype: male (Figs. 1–3, 5–8). Length 2.28 mm, greatest width 0.81 mm. Body (Figs. 1, 2) elongate, subparallel; surface with punctures 1/2 to 2/3 the diameter of eye facets and usually separated by about twice their diameter; dorsum sparsely covered with fine, recumbent and pale setae, except scutellum; venter covered with longer and sparser setae than dorsum, with plastron present.

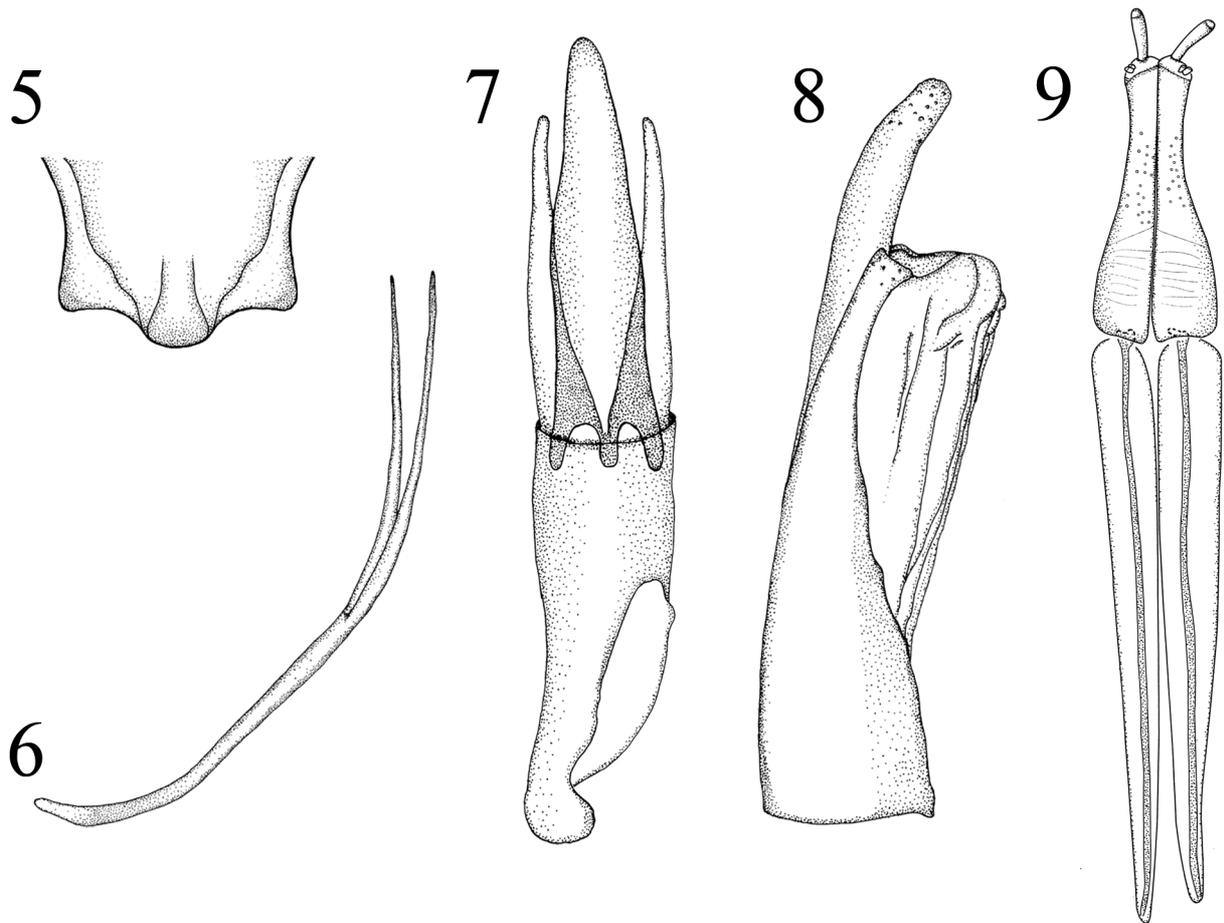
Color (Figs. 1–4): Cuticle shining and dark brown except as follows: antennae yellowish brown, with basal 3/4 of last segment dark brown; labrum with anterior margin yellowish brown; pronotum with anteromedial portion yellowish brown; each elytron with two oval, yellowish brown patches: one larger, extending diagonally from umbo to second stria at basal 1/5, and the other smaller, on medial portion of the apical 2/5; medial 1/6 of elytral apex with rectangular and longitudinal paler patch; venter; mouth-parts and legs yellowish brown. **Head** (Figs. 1, 2): Without distinct impressions; frontal margin slightly emarginated. Eyes protuberant; laterally rounded; separated by a distance 3/2 times wider than eye. Antennae 11 segmented; long and slender; last segment swollen and twice as long as the segment 10. Frontoclypeal suture present between bases of antennae. Clypeus slightly broader and shorter than labrum; anterior margin slightly emarginated; lateral angles broadly rounded. Labrum rectangular; anteromedial portion slightly emarginated; anterolateral angles rounded, with numerous long and pale hairs. Maxillary palpus with four segments; last segment flattened, twice as broad as second segment and longer than the other segments combined. Labial palpus with three segments; last segment flattened, three times wider than second segment.

Thorax (Figs. 1, 2, 5): Pronotum (Fig. 1) longer than wide; one sublateral carina, on each side, present on basal third but in some specimens hardly distinguishable; impressions (oval, on medial area of pronotal disc; transverse, on anterior 2/5, extending between lateral margins; and oblique, between pronotal half and posterior margin); anterior portion narrower than posterior portion; anterior angles broadly rounded; anterior margin broadly convex, arcuately extended over base of head; posterior angles, slightly produced, acute; posterior margin with three arches, two broad, one on each side in front of the elytron, and one narrow in front of scutellum. Elytra (Fig. 1) subparallel; about three times as long as pronotum; third interval feebly convex at

base, anterior margin convex; humeral angle broadly rounded; apex moderately extended and truncated; each elytron with two sublateral carinae, one on the basal half (inner, on sixth interval) and the other on the apical half (outer, on eighth interval); lateral margins crenate; disc with punctures separated by twice their diameters, punctures half as wide as intervals between striae. Scutellum (Fig. 1) slightly convex; barely longer than wide; subpentagonal, with angles rounded. Prosternum (Figs. 2, 5) with anterior margin concave, wider than posterior margin; prosternal process subquadrate, wider than long, extending slightly beyond anterior coxae, posterior margin with rounded medial angle, broader than lateral angles. Mesosternum (Fig. 2) wider than prosternum, 1/3 as long; posterior margin concave, wider than anterior margin. Metasternum (Fig. 2) with median, longitudinal, sulcus on posterior 4/5; anterior margin convex; posteromedial area sinuate, acute; posterior portion in front of coxae with pair of transverse arched sulci. Legs (Fig. 2) long; pro- and mesocoxae globular; tibiae with distinct apical fringes of tomentum, two fringes (anterior and posterior sides) on the front and middle tibiae and only one fringe (posterior side) on the hind tibiae.



FIGURES 1–4. *Hintonelmis anamarie*, sp. n. (1) Dorsal habitus. (2) Ventral habitus. (3) Male abdomen showing spicule. (4) Female abdomen showing spicule.



FIGURES 5–9. *Hintonelmis anamarie*, sp. n. (5) Prosternal process. (6) Male spicule. (7) Male genitalia (dorsal). (8) Male genitalia (lateral). (9) Female genitalia (dorsal).

Abdomen (Figs. 2–4): Sternum 1 (Fig. 2) with anterior portion obtusely angulated between posterior coxae; without discal carinae. Sternum 5 (Fig. 2) with clasp at posterolateral angles; long setae extending beyond posterior margin. Spicule (Figs. 3, 6) half as long as abdomen; anterior portion subacute, curved until basal 1/5; curved bifurcation starting on anterior half; posterior arms gradually narrow and divergent.

Genitalia (Figs. 7, 8): Parameres (Figs. 7, 8) elongate; in dorsal view (Fig. 7) continually narrowed to apex, apex acute; in lateral view (Fig. 8) continually narrowed and curved to venter beginning at posterior 1/3; anterior 1/10 continually spatulate; apex truncate. Median lobe (Figs. 7, 8) about 1/4 longer than parameres; in dorsal view (Fig. 7) continually narrowed to apex, apex subacute; in lateral view (Fig. 8) curved and narrowed from anterior 1/8 to apex; apex rounded.

Plastron: Present on the genae, the anterior part of the hypomera, the epipleura, the pro-, meso- and metasternal episternae, the sides of the metasternum, most of the abdomen, (except the medial area of the first three sternites), the coxae, the trochanters, the femora (except for the distal 3/4 of the dorsal side), and the tibiae (except for the dorsal side).

Female. Externally similar to male.

Abdomen (Fig. 4): Spicule as long as 3/4 of the length of the abdomen; anterior portion rounded; bifurcation starting on anterior 2/7; posterior arms parallel, diverging and curved only on posterior 1/9.

Genitalia (Fig. 9): Coxites with 1/2 the length of the styli; in dorsal view: about two times longer than wide. Styli elongate; in dorsal view: basal segment narrowed from base until the apical 1/5; apex of each basal segment truncate and with two small cylindrical sensillae on the apical surface; apical segment narrow, cylindrical and with 1/5 the length of the basal segment.

Intraspecific variation. Size range (n=14): length 2.16–2.52 mm, greatest width 0.72–0.78 mm. Color: little variation in the size of the patches on elytra; little variation in cuticle tonality. The specimens examined did not have significant morphological variation.

Morphological notes. Through the translucent abdominal sternites it is possible to see the shape of the spicule (which differs between male and female). This technique helps avoid extraction of the genitalia (which, in many cases, causes the destruction of parts of the bodies of these minute specimens) to distinguish the gender.

Type locality. Brazil, Amazonas State (AM), Presidente Figueiredo Municipality, Igarapé da Onça stream, Sossego da Pantera, km 20, Amazonas State Highway 240 (AM 240), 02°02'S, 59°50'W.

Type series. *Holotype*: Male, 'Presidente Figueiredo, AM, Igarapé da Onça, Sossego da Pantera, km 20, AM 240, A. M. O. Pes leg. 4–5/09/2000 blacklight Pennsylvania trap, Coleção de Invertebrados (INPA). *Paratypes*: 6 females, same data as holotype, Coleção de Invertebrados (INPA); 3 males, same data as holotype except '3-5/08/2000', Coleção de Invertebrados (INPA); 2 males, same data as holotype, Coleção Entomológica José Alfredo Pinheiro Dutra (UFRJ); 2 females, same data as holotype, Coleção Entomológica José Alfredo Pinheiro Dutra (UFRJ).

Habitat notes. The type series was collected with light traps placed by a second-order stream with a bedrock streambed in a fragment of *terra firme* (upland) forest in northern Brazil. Since no specimens of *H. anamariae* **sp. nov.** were found in our collections in the streams in the region, we cannot be sure of the habitat of the species. However, species in the genus *Hintonelmis* are usually found on submerged decaying woody debris deposited in rapids, a type of microhabitat found in abundance at the original type series locality.

Etymology. The species epithet, *anamariae*, is in honor of Dr. Ana Maria O. Pes (Instituto Nacional de Pesquisas da Amazônia, Amazonas, Brazil) in recognition of her contribution to the knowledge of aquatic insects in Amazonia.

Discussion

Of all the *Hintonelmis* species, the most closely related to *H. anamariae* **sp. nov.** are *H. sandersoni* Spangler, 1966, *H. sul* Hinton, 1971, *H. sloanei* Hinton, 1971, *H. opis* Hinton, 1971, *H. atys* Hinton, 1971, *H. perfectus* (Grouvelle, 1908), *H. carus* Hinton, 1971 and *H. maro* Hinton, 1971. These species have parallel body and tibiae (Figs. 1, 2) with plastron (Spangler, 1966; Hinton, 1971).

The new species described here can be distinguished from *H. perfectus*, *H. carus* and *H. maro* by the absence of plastron on the trochanters of these three species (Hinton, 1971). *Hintonelmis anamariae* **sp. nov.** can be distinguished from *H. sandersoni*, *H. sul* and *H. sloanei* by the presence of plastron on the middle portion of the first sternite in these three species (Hinton, 1971) (Fig. 2). *H. anamariae* **sp. n.** can also be distinguished from *H. sandersoni* and *H. sul* by the absence of sublateral carinae on the elytra (Fig. 1) of these two species (Spangler, 1966; Hinton, 1971).

The external morphology of *H. opis* and *H. atys* resembles that of *H. anamariae* **sp. nov.**, but the three species can be easily distinguished by their color patterns: *H. opis* (antennae with 4 to 7 apical segments darkened; pronotum with two anterior black patches; each elytron with a scutellar, three discal, and one lateral black patch), *H. atys* (antennae with only the apical segment darkened; head with a basal, median dark patch on each side behind the eye; pronotum with two complete discal dark stripes; elytra with a dark stripe on the second and third intervals; this stripe joins a lateral dark stripe near the apex) and *H. anamariae* **sp. nov.** (as described previously). The morphology of the male genitalia differs between these two species and *H. anamariae* **sp. nov.** as follows: *H. opis* [(dorsal view) median lobe longer and more slender on apical portion] and *H. atys* [(dorsal view) median lobe slightly wider; parameres curved on apical 1/3, converging to median lobe; (lateral view) median lobe slender].

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