ABSTRACT: A new monotypic genus is herein described to accommodate the Western Cuban endemic schizomid *Schizomus decui* Dumitresco, 1977, currently placed in the “dumitrescoae” species-group of *Rowlandius* Reddell et Cokendolpher, 1995. The new genus is diagnosed from all other Hubbardiinae by a combination of several morphological characters of both sexes, including a very strong sexual dimorphism in setation of the propeltidium and tergites II–VII, male pedipalp armature and female spermathecal structure.

Introduction

As an outcome of the second Cubano-Romanian speleological expedition to Cuba in 1973, Dumitresco [1977] described a very conspicuous schizomid *Schizomus decui* Dumitresco, 1977, currently placed in the “dumitrescoae” species-group of *Rowlandius* Reddell et Cokendolpher, 1995. The new genus is diagnosed from all other Hubbardiinae by a combination of several morphological characters of both sexes, including a very strong sexual dimorphism in setation of the propeltidium and tergites II–VII, male pedipalp armature and female spermathecal structure.

Very few literature references to this rare species appeared thereafter, mostly because its collections were both scarce and sporadic. Armas & Alayón [1984] listed *S. decui* as cave-dwelling and wrongly suggested it as a probable junior synonym of *Schizomus antilus* Hilton, 1933, without realizing the latter had been accurately synonymized already by Rowland & Reddell [1980] under *Schizomus portoricensis* Chamberlin, 1922.

Later, Armas [1989] described and depicted the pedipalps of the homomorphic male and presented a second, rudimentary drawing of the spermathecae [Armas, 1989: fig. 5b], which was much less detailed than the fine line art originally published by Dumitresco [1977: fig. 5b]. In the same paper, Armas [1989: 24] unfairly stated that “... the possibility that *S. decui* could be a synonym of *S. portoricensis*, suggested by Armas & Alayón [1984: 9], must be discarded” (original text in Spanish, English translation added herein).

In their global revision of schizomids, Reddell & Cokendolpher [1995] described the genus *Rowlandius* for the former “dumitrescoae” species-group of *Schizomus* (which by then had already doubled its initial membership to 25 species) and transferred *S. decui* accordingly. From then on, only a few references were made to this schizomid [Armas, 2001, 2004, 2013; Harvey, 2003; Teruel, 2003], including its first record for Mayabeque Province [Armas, 2002]. Finally, Giupponi et al. [2016] revised the “dumitrescoae” species-group and updated its diagnosis, but unfortunately no specimens of *R. decui* were revised and the authors relied entirely upon previously published data, being unaware that some of these were incomplete and/or even erroneous (see below).

Methods and Material

Specimens were studied under a Zeiss Stemi 2000-C stereomicroscope equipped with a line-scale eyepiece for mensuration and a Canon PowerShot A620 digital camera for photographs. Chelicerae and female spermathecae were carefully dissected from specimens.
immersed in 80% ethanol and mounted on microscope slides in a drop of concentrated lactic acid. The slides were then transferred to an Optech-B3 microscope equipped with a DCM-310 image-capture system and observed continuously until all structures of interest became sharply visible and then photographed; last, all dissected body parts were stored in a micro-vial together with the specimen of origin. Habitat photos were taken with a Nikon Coolpix S8100 digital camera.

For all photos made with both microscopes, a variable series of consecutive-plane shots was taken depending on the field depth (i.e., the bulkiest the structure, the largest number of photos needed) and afterwards, all images of the same structure were assembled into a single fully-focused image using the free software CombineZP. All digital images were processed with Adobe Photoshop CS5 only for basic bright/contrast optimization, removing artifacts from the background and resizing to assemble the plates.

Unless otherwise noted, all character descriptions and measurements given in the text refer to adults of both sexes. General nomenclature corresponds to Reddell & Cokendolpher [1995] except for flagellum subdivision and setation [Monjaraz-Ruedes et al., 2016]. Measurements were taken after Teruel [2003]: adult size refers to total length and includes the flagellum, which in males includes the pedicel. In the male flagellum, the pedicel/bulb angle was determined after Teruel [2015]. Setation pattern of tergites II–VII is herein given as a formula, with the setal count of each segment separated by slashes, i.e., a 2 / 2 / 2 / 2 / 2 / 2 formula means that each of the six tergites has only two setae (the standard for Hubbardiidae).

Classification of adult males in heteromorphic and homomorphic forms follows Armas [1989], i.e., pedipalps either quite different from or similar to females, respectively. Very recently, Giupponi et al. [2016] further subdivided the former into “α and β heteromorphic”, but such modification, although obvious and generally correct, is not followed here because pedipalp elongation within the heteromorphic form actually varies in a wider range, with intermediate forms that do not match what was proposed by Giupponi et al. [2016]; see for example Teruel [2003: 46, 57, 61; tabs. I, VI–VII].

All specimens are preserved in 80% ethanol, and abbreviations of repositories as follows: Institut de Spéléologie “Emile Racovitza”, Bucharest, Romania (ISER), Instituto de Ecología y Sistemática, Havana, Cuba (IES), present author’s personal collection (RTO).

Systematics

_Dumitrescoella_ gen.n.

_Figs. 1–5._

_Schizomus_ [in part: references to _S. decui_ only]: Dumitresco, 1977: 147, 151–157; figs. 4–5; Rowland, Reddell, 1979: 161, 163, 173–178, 180–181, 184, 188, 192; figs. 8, 10, 26, 47; tabs. 3–4; Armas, Alayón García, 1984: 9; Armas, 1989: 24–26, 29–30, 34, 36, 45; figs. 3, 5b, 14; Reddell, Cokendolpher, 1995: 1.


_TYPE SPECIES._ _Schizomus decui_ Dumitresco, 1977 [currently _Dumitrescoella decui_ (Dumitresco, 1977), comb.n.], by both present designation and monotypy.

_DIAGNOSIS._ Size medium to moderately large for the family (3–4 mm). Coloration (Figs. 1–3): immaculate dark to blackish green, with chelicerae and pedipalps reddish. Body without clavate setae. Cheliceral movable finger (Fig. 4): ventrointernal margin with serrula and guard tooth, ventroexternal margin with a crenulate lamella progressively stronger distally. Pedipalps (Figs. 1–3, 5) sexually dimorphic and polymorphic: long and slender in heteromorphic males vs. short and robust in homomorphic males and females; trochanter with internal spur. Propeltidium without true ocelli, but with ordinary eyespots instead; anterior process with two apical setae (1 + 1), dorsal setae sexually dimorphic: two pairs in males vs. five pairs (second submedian pair sometimes incomplete) in females. Metapeltidium entire. Tergites II–VII with setation unmodified but sexually dimorphic: standard formula 2 / 2 / 2 / 2 / 2 / 2 in males vs. increased 2 / 4 / 6–8 / 8–10 / 10–12 / 14–16 (a few pairs sometimes incomplete) in females. Leg IV femur moderately robust, anterodorsal margin angled at 90°. Male: pedipalp patella and tibia in heteromorphics and homomorphics ventrizontally armed with large, dark, knife-like spiniform macrosetae (some of them arising from enlarged setiferous tubercles, denser and stronger in largest heteromorphics, see Fig. 5); heteromorphic with pedipalp trochanter elongate, with femoral articulation narrow and in anterodistal position, thus, with apex not produced. Abdomen (Figs. 6–7) not attenuate, abdominal segments XI–XII without modified setae; segment XII modified but sexually dimorphic: two pairs in males vs. three pairs (second submedian pair sometimes incomplete) in females. Metapeltidium entire. Tergites II–VII with setation unmodified with dorsoposterior process very weak, widely convex. Flagellum (Figs. 6–7) lanceolate, depressed and essentially flat, with pedicel/bulb angled roughly at 180°; pedicel medium-sized and compressed (remarkably deeper than wide); bulb dorsal surface with a conspicuous, round subdistal depression bordered anteriorly by a broadly Y-shaped dome; setation pattern: single _dm_, _dm_, _vm_ and _vm_, paired _dl_, _dl_, _dl_, _vm_, _vm_, _vl_ and _vl_ with _dm_, located at pedicel-bulb junction, and _dm_ in subapical position inside the depression. Female: Flagellum (Fig. 8) with four flagellomeres and three annuli; setation pattern per flagellomere: none / single _dm_ and _vm_, paired _dl_ and _vm_ / paired _dm_ and _vm_ and _vm_ / single _dm_ and _vm_, paired _dl_, _dl_, _dl_, _vl_ and _vl_. Spermathecae (Fig. 9) with two pairs of very simple, match-shaped lobes: relatively short and slender, curved outwards (more strongly in the lateral pair, which is also somewhat longer), subcylindrical, with apical bulbs obsolete to vestigial. Chitinized arch well sclerotized, short and wide, cordiform. Gonopod large and widely oval.

_COMPARISONS._ The very strong sexual dimorphism in the dorsal setation of the propeltidium makes
A new genus of micro-whipscorpions (Schizomida: Hubbardiidae) from western Cuba

Figs. 1–11. 1–3 — freshly preserved adults of *Dumitrescoella decui* comb.n. from the source of the Ariguanabo River, lateral view: 1 — large heteromorphic male; 2 — homomorphic male; 3 — female. 4–7 — freshly preserved heteromorphic male of *D. decui* comb.n. from the source of the Ariguanabo River: 4 — right chelicera, external view; 5 — pedipalp patella (distal half only), tibia and tarsus, lateral view; 6–7 — abdominal segments VII–XII and flagellum, dorsal and lateral views. 8–9 — freshly preserved female of *D. decui* comb.n. from the source of the Ariguanabo River: 8 — abdominal segments VII–XII and flagellum, dorsolateral view; 9 — spermathecae. 10 — map of western Cuba, showing the distribution of *D. decui* comb.n.: new records herein given (white dots), previous literature records (black dots). 11 — habitat of *D. decui* comb.n., at the exact collection site at the source of the Ariguanabo River.

Рис. 1–11. 1–3 — свежесобранные половозрелые особи *Dumitrescoella decui* comb.n. из истоков реки Аригуанабо, латерально: 1 — большой гетероморфный самец; 2 — гомоморфный самец; 3 — самка. 4–7 — свежесобранный гетероморфный самец *D. decui* comb.n. из истоков реки Аригуанабо: 4 — правая хелицера, вид снаружи; 5 — колено педипальпы (только дистальная половина), голень и лапка, латерально; 6–7 — сегменты абдомена VII–XII и хвостовой отросток, дорсально и латерально. 8–9 — свежесобранные самка *D. decui* comb.n. из истоков реки Аригуанабо: 8 — сегменты абдомена VII–XII и хвостовой отросток, дорсолатерально; 9 — сперматеки. 10 — карта западной Кубы, показано распространение *D. decui* comb.n.: новые находки (белые точки), ранее известные литературные данные (черные точки). 11 — биотоп *D. decui* comb.n., в месте сбора материала в истоках реки Аригуанабо.
**Dumitrescoella** gen.n. stand apart from almost all other Hubbardiinae (see further comments in Remarks section below). In particular, up to five pairs of dorsal setae in the female is a striking autapomorphy for the entire Hubbardiidae (Cook, 1899; such numbers are so far restricted to members of Protoschizomidae Rowland, 1975).

Another character diagnostic for this genus amongst other Hubbardines is the increased setation pattern of female tergites which is shared only by four other genera: *Antillostenocharus* Armas et Teruel, 2002 (Greater Antilles), *Clavizomus* Reddell et Cokendolpher, 1995 (southeast Asia), *Mayazomus* Reddell et Cokendolpher, 1995 (western Central America) and *Paradraculoides* Harvey, Berry, Edward et Humphreys, 2008 (western Australia). All of them differ from *Dumitrescoella* gen.n. as follows:

**Antillostenocharus.** 1. Male pedipalp: patella greatly reduced, always the shortest segment in heteromorphics and shorter than at least both the femur and the tibia in homomorphics, trochanter in heteromorphics not elongated and conspicuously curved upwards, tibia in heteromorphics ventrally armed with two parallel rows of large, dark, knife-like spiniform macrosetae. 2. Spermathecae with all four lobes tubular and apically narrowed. 3. Female flagellum with three flagellomeres and two annuli.

**Clavizomus** (data taken from original descriptions and figures of Reddell & Cokendolpher [1995]). 1. Pedipalp trochanter lacking internal spur. 2. Entire body surface of bulb with two sharp submedian prominences and deeper than bulb. 3. Spermathecae lacking gonopod.

**Mayazomus** (data taken from descriptions and figures of the two most recent generic revisions of *Mayazomus* Dumitresco, 1973, 1977). 1. Homomorphic male pedipalp: trochanter not elongate, with femoral articulation very wide and on mediiodorsal position (i.e., approximately horizontal to the trochanter longitudinal axis) and with apex strongly produced into a triangular flat projection, femur and tibia each distally with a large ventrointestinal spur, patella club shaped and strongly curved downwards. 2. Chelicer movable finger with ventroexternal margin smooth, lacking any accessory teeth or lamella. 3. Spermathecae with median lobes usually longer than lateral lobes.

**Paradraculoides** (data taken from original description and figures of Harvey et al. [2008]). 1. General aspect completely different, troglomorphic: coloration pale yellowish, ocular eyespot absent. 2. Metapeltidium divided. 3. Homomorphic male with pedipalp trochanter lacking internal spur. 4. Male flagellum very elongated and densely covered with thick spiniform setae. 5. Female flagellum with three flagellomeres and two annuli. 6. Spermathecae with lateral and median lobes basally fused into a Y-shape. 7. Female gonopod bifurcated.

**ETYMOLOGY.** The selected generic epithet is feminine in gender and honors Margareta Dumitresco (formerly at Institut de Spéologie “Emile Racovitza”, Bucharest, Romania) for her contributions to the knowledge of Cuban schizomids. More than 40 years later, the six species she described [Dumitresco, 1973, 1977] remain valid, and her descriptions still represent a hard-to-match standard of detailed and exquisitely illustrated taxonomic work.

**DISTRIBUTION** (Fig. 10). Monotypic genus, endemic from western Cuba. Its single species *D. decui* comb.n. has been found in seven localities scattered across a roughly oval area of 110 x 20 km, in the northern watershed of the provinces of Artemisa, Mayabeque and Matanzas. It is also expected to occur in the few forest remnants of La Habana Province (= Havana City), such as those along the Quibú, Almendares and Bacuranao Rivers, which are in the center of the known distribution area and still have suitable habitats.


**Previous records for Dumitrescoella decui comb.n.** (Fig. 10). MATANZAS Province: Matanzas Municipality: Bacunayagua: La Pluma Cave (type locality); 30.04.1973; V. Decu, Ş. Negrea; 2 ♂♂ heteromorphic, 3 ♀♀ (ISER), see Dumitresco [1977]. ARTEMISA Province: San Antonio de los Baños Municipality: source of Ariguanabo River, 4 km north of San Antonio de los Baños; 22°55’27″N – 82°29’43″W, 90 m a.s.l.; 31.12.2016; R. Teruel, S. Yong, R. Velázquez; 4 ♂♂ heteromorphic, 1 ♂ homomorphic, 5 ♀♀ (RTO).

**ECOLOGICAL NOTES.** According to the published literature and personal data of the present author and his field collaborators, the single species of this genus is restricted to lowland (20–140 m above sea level) limestone areas of karstic relief covered by semicaducifolious forest (Figs. 10–11). It lives under rocks semi-buried in the leaf litter from the seashore to less than 20 km inland.
This kind of landscape is abundant in cave formations and **Dumitrescoella decui** comb.n. has indeed been found in two caves, including the type locality [Dumitresco, 1977; Armas, 2002]; it is obviously a troglophile.

In all known localities, it lives syntopically with the hubbardiid *Stenochorus portoricensis* Chamberlin, 1922, which always outnumbers it markedly [Armas, 1989; R. Teruel, present data].

REMARKS. The four new localities recorded above for *Dumitrescoella decui* comb.n., include its first collections in Caimito and Bauta Municipalities (Artemisa Province), which extends its known geographical distribution 13 km westwards (Fig. 10).

It is intriguing that the two previous authorities that studied adults of both sexes of this schizomid (Margareta Dumitresco and Luis F. de Armas) did not notice the strong sexual dimorphism in setation of propeltidium and tergites, and gave only counts corresponding to male; even Armas [2001: 95] explicitly diagnosed the female (then placed in *Rowlandius*) as having only two pairs. It seems likely that these authors got the counts from the males and apparently assumed that the females did not differ, as no sexual dimorphism is typical in H spinose.
– Habitúos not-troglomórficos: coloración uniformemente verde o amarilloso brillante, con pedipalpos de coloración verdosa, ojos con una línea de puntos que generalmente son incoloros, pero no especialmente atenuados. Male: segmentos abdominales XI–XII con pincelado de setas…………………………………… 6

5. Pedipalpo trochantar lacking internal spur. Male: abdomino- nal segment XII with dorsoposterior process small and ac- cute; flagellum lanceolate in dorsal view, with pedicel long and narrow, dm, seta located medially on pedicel. Female: spermathecae with median and lateral lobes cy- lindric, basally fused into a V-shape………………………..

.............................. Cubacanthozomus Teruel, 2007

– Pedipalpo trochantar with internal spur present. Male: ab- dominal segment XII lacking dorsoposterior process; flagellum round in dorsal view, with pedicel very short and wide, dm, seta located basally on bulb. Female: spermathecae with median and lateral lobes conical, not fused ………………….. Troglodibuzomus Teruel, 2003

6. Tergite II with 4–8 setae. Male: pedipalp patella conspic- uously reduced, being always the shortest segment in heteromorphics and much shorter than at least both fem- ur and tibia in homomorphics. Female: tergites IV–VII with 4–24 setae ………………………………………………………………..

.............................. Stenocharis Chamberlin, 1922

– Tergite II with only two setae. Male: pedipalp patella unmodified, always the longest segment or exception- ally just slightly shorter than femur only. Female: tergites IV–VII with only two setae ………………………………………….. 7

7. Male: flagellum bulb hexagonal in dorsal view, with a large, circular dorsomedial depression. Female: sper- mathecae with median and lateral lobes heavily sclero- tized, club shaped and densely perforate by conspicuous glandular pores ………………….. Troglocubazomus H. Armás, 2002

– Male: flagellum bulb variable in dorsal view, but never hexagonal nor with a large, circular dorsomedial de- pression. Female: spermathecae with median and lateral lobes variable, but never especially sclerotized and with sur- face entirely smooth or sparsely permeated by inconspicui- tuous glandular pores……………………………………….. 8

8. Metapoditum clearly divided. Female: spermathecae with median and lateral lobes basally fused into a V-shape and lacking apical bulbs; flagellum with three flagellomeres and two anuli ……………………………………………………..

.............................. Cubazomus Reddell et Cokendolpher, 1995

– Metapoditum entire (an incomplete pale median line may occur, but never a true division). Female: spermathecae with median and lateral lobes usually not fused, if so, then also at least one pair with well-defined apical bulbs and flagellum with four flagellomeres and three anuli ……….. 9

9. Male: flagellum bulb globose in lateral view, with dorsal surface slightly concave and lacking conspicuous sculp- ture or relief, ventral surface very strongly and abruptly convex. Female: flagellum with three flagellomeres and two anuli; spermathecae with 3–4 pairs of very short and thick lobes ………………………………………………………………..

.............................. Antillosthenochus H. Armás et Teruel, 2002

– Male: flagellum depressed in lateral view, with dorsal surface flat to convex and with conspicuous sculpture or relief of protuberances, coarse carinae and/or small de- pressions and furrows, ventral surface shallowly to mod- erately convex. Female: flagellum with four flagellomeres and three anuli; spermathecae with only two pairs of lobes ……………………………………………………………….. 10

10. Male: abdominal segment XII lacking dorsoposterior pro- cess; heteromorphic pedipalp tibia with a ventrodis- tal spur opposed to tarsus (replaced in homomorphic by a thick spiniform macroseta). Female: spermathecae with chitinized arch V-shaped, median and lateral lobes cy- lindrical and lacking apical bulbs………………………………………..

.............................. Guanazomus H. Armás et Teruel, 2002

– Male: abdominal segment XII with dorsoposterior process variable, but always present; heteromorphic pedipalp tibia variable, but always lacking a ventrodistal spur. Female: spermathecae with chitinized arch variable, but never V-shaped, median and lateral lobes variable, but either match-shaped or at least one pair with well-de- fined apical bulbs ………………………………………………... 11

11. Cheliceral movable finger with a ventroexternal crenu- late lamella. Male: abdominal segment XII with dorso- posterior process very weak. Female: tergites III–VII with 4–16 setae; spermathecae with median and lateral lobes greatly differentiated ……………………..

– Cheliceral movable finger with several ventroexternal teeth. Male: abdominal segment XII with dorsoposterior pro- cess moderate to very strong. Female: tergites III–VII with only two setae; spermathecae with median and lat- eral lobes variable, but at least one pair with well-de- fined apical bulbs ………………………………………………... Rowlandius Reddell et Cokendolpher, 1995

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