A new genus of stygobitic/troglobomorphic ciriolanid (Isopoda: Ciriolanidae) from a “blue hole” cave in the Bahamas

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Abstract

From an inland “blue hole” cave on Norman’s Pond Cay (Exumas, Bahamas) one female specimen of a remarkable new stygobitic/troglobomorphic ciriolanid has been caught, which is here described as *Exumalana repta* n.g. n.sp. A combination of numerous characters, especially of antennal, pereopodal, pleopodal, and tail-fan morphology, distinguishes the new genus from all hypogean ciriolanids already described, its affinities being for the time being unclear. Moreover, the behaviour of the new species seems to be original.

**Key words:** Isopoda Ciriolanidae, stygobitic/troglobomorphic fauna, Bahamas, taxonomy.

Résumé

Un exemplaire femelle d’un remarquable ciriolanide stygobite/troglobomorphe a été capturé dans une grotte du type “bleue” creusée à l’intérieur de Norman’s Pond Cay, (Exumas, Bahamas). Celui-ci est décrit comme *Exumalana repta* n.g. n.sp. Le nouveau genre se distingue de tous ceux de Ciriolanidae souterrains décrits à ce jour par la combinaison de nombreux caractères surtout de morphologie des antennes, des péréiopodes, des pleuropodes, les affinités du nouveau genre restant pour l’instant obscures. Le comportement de la nouvelle espèce semble être original.

**Mots-clés:** Isopoda Ciriolanidae, faune stygobite/troglobomorphe, Bahamas, taxonomie.

Introduction

During exploration by diving (2002) in caves of the Exumas (Bahamas) the 2nd author has rediscovered two ciriolanid species already described: *Ciriolana (Ciriolana) troglexuma BOTOSANEANU & ILIFFE, 1997* has been caught (1   14.VIII.2002) in the type locality: Oven Rock Cave, Great Guana Cay, and 1   of *Bahalana viguerae* (CARPENTER, 1994) has been caught (9 VIII.2002) in a new locality for the species: Basil Minn’s Blue Hole, Great Exuma. However, the most interesting discovery of Ciriolanidae during this field work campaign has been that of a remarkable new genus which will be described below.

**Diagnosis of Exumalana n.g.**

A small, entirely degeminated, opalescent ciriolanid, able to a limited extent to roll its body. Cephalon transversely oval. Pilon short, from 5 distinct segments. Pleotelson large, almost semicircular in outline, very strongly vaulted, only with minute setulae on distal margin. AI and AI short, all even slightly shorter than AL peduncle of both AI and AL from 4 articles. Molar lobe of mandibles distally with perfectly margined row of denticles, proximally with long row of cilia; left mandible with strong sclerotized element at external end of spine row of plum spines lober. Lateral lobe of maxilla I ending in complex of 3 dark “teeth”. Pereiopods I and II similarly prehensile (without exceedingly strong propodi), in strong contrast with ambulatory pereiopods III-V which are basically similar; unguis of all pereiopods with a pair of secondary unguises. All pleopods with protopodites transversely elongate; only endopodites I and II (very scarcely) setose; exopodites III-V entirely bipartite, setation of endopodites IV and V very scarce. Uropods completely ankylosed; shorter than pleotelson, almost entirely concealed under its vault; basipodite very thick – set. very scarcely armed; exopodite small, oval; endopodite much larger – only slightly shorter than basipodite –, nearly round; marginal armament of exo- and endopodite characteristics, strongly asymmetric.

**Exumalana repta** n.sp.

(Figs 1–25)

**LOCALITY AND MATERIAL.**

Female holotype (deposited in the crustacean collection of the Institut Royal des Sciences Naturelles de Belgique, Brusels, n° I.G. 29862) collected by Th. M. ILIFFE on 15.VIII.2002 in Norman’s Pond Cave, Norman’s Pond Cay, Exumas, Bahamas, from the rock wall of the first room of this inland “blue hole” cave, in some 8m depth. The water in Norman’s Pond Cave is completely marine: at high tide seawater flows directly into the cave. A profile map of the cave has been published in KORNICKER & ILIFFE, 1998.
DESCRIPTION

Fully extended the specimen measures 6.2 mm. It is completely pigmented, anophthalmous, devoid of segmental relief. The habitus drawing made from the specimen in alcohol shows that a limited capacity of rolling the body does exist.

Cephalon short but broad, roughly oval, not entirely ensheathed into 1st percurrent segment, with small pointed rostrum. Clypeus with tips protruding beyond labium with out leaning up against its sides; lamina frontalis strong, broadening distally, blunt ending. All percurrent and odial plates are similarly oval and not ending in sharp points; from these of periconch IV-VII there are strong projections directed ventrally, and placed cephalic from the roots of the periconch. Pauster short, from 5 free segments, in the partly rolled animal, phosinite I-although large—is mainly concealed under periconch VIII; tips of all pleontes small, rhombic, those of pleonite V concealed under pleonite IV (all tips concealed in the rolled specimen). Pleonotal large, almost semicircular in outline, very strongly vaulted; its distal margin is only minimally inflected, and only armed with minute setae.

Antennae and antenna both short, not reaching beyond posterior limit of 2nd percurrent segment. All even slightly shorter than A1. A1 peduncle with 4 articles (5th longest), all with plumose setae—not less than six, on 2nd article; flagellum with 12 articles, articles 4 and 11 distally with one aesthetasch, articles 7-10 with pairs of aesthetaschi. A1 peduncle with 4 articles, art. 1-2 similarly short, art. 3 longest, art. 4 longest, not less than six plumose setae distally on 4th; flagellum with 14 articles, 1st 1 one longest, all with distal tuft of short setae.

Axes of right and left mandible very distally, both mandibles molar lobe characterized distally by long, perfectly marginal row of rather large denticles, and proximally by long row of spines, in the left mandible the "plump spinose lobe" shows an external margin of the spine row—a strong, sclerotized "tooth".

Maxilla I, lateral lobe with well individualized tip consisting of three sclerotized (dark, glabrous) teeth placed in a central plane; lobe margin armed with 3-5 finely pectinate setae, ending very strongly cleft, its four apical setae circunplumose.

Maxilla II, external lobe with some 7 finely pectinate setae, median lobe with 11 setae; 5 external ones finely pectinate, remaining ones very short, plumose—large, twisted internal lobe with about 10 circunplumose setae.

Maxilliped, mandibulary lobe (perpendicularly fastened to pulp surface) with 2 coupling hooks and 5 plumose setae—two of them apical.

The essential trait of the pericranial morphology is the strong contrast between the rostral P4-8 and the ambulacral P1-7 II, P and PL strongly armed and armed, despite the fact that their propodi are not excessively broadened, are very similar, the most marked difference between them being in the shape of carpus (triangular in P4, rectangular in PL). P1-7 II are all very similar, although they become progressively longer (stout) and propodi being mainly responsible for this. Three elements are characteristic for all peripods: short dactylus; urnus accompanied by a pair of secondary urtigias; short pectinate spines with amphi setae being the dominant element of the armament.

Peripods protopodites all strongly elongate transversely, the number of their coupling spines decreasing in the series. Endopodia strongly increasing in size in the series, those of P1 and II with only three apical setae, remaining ones glabrous. Exopodites large; setation relatively scarce on those of P1 II, reduced to some 5 setae on PL IV, and to only two on P5.

The apotroches, shorter than the protostomes, are completely ankylosed (matatory function certainly lost); they are tightly rooted inside the protostome vault, and almost completely concealed under this vault; busping very thick-set, apico-internal angle scarcely developed, apico-external angle developed as rather large blunt projection, only a few short spines along external margin; exopodite small (2/3 of the length of the endopodite), perfectly oval, endopodite much larger, roughly round in outline; the characteristic marginal armament of cox and endopodite needs no description, being illustrated in detail (rather surprising is the presence on the dorsal surface of the endopodite of only one plumose seta).
Figs 4-5. *Eumalama reptans*, left Al and All (same scale).

**AFFINITIES**

Careful comparison with all described genera of (or at least including) subterranean Chelantidae—as listed in Botosaneanu, Bruce & Notenboom (1986), or in Botosaneanu (2001: 38)—shows that it would be quite artificial to "push" the new species into one of them. Of course, some morphological details are shared with species belonging to one or another of already described genera. Nevertheless, the combination of numerous characters as detailed in the diagnosis (some of them of paramount importance, concerning antennae, pereiopods, pleopods, tail-fan...) is evidence that we have here a well-defined genus of obscure affinities. It seems improbable that convincing evidence will be found in the future for kinship with some marine, non-rogomorphid genus.

**BEHAVIOUR**

The 2nd author has been diving in Norman’s Pond Cave on numerous occasions during several years, but the holotype of *Eumalama reptans* n.g. n.sp. is the only isopod specimen having been seen there. The specimen has been collected from the rock wall of the cave where it was moving in and out small holes in the bedrock—a behaviour in contrast with that of most other Bahamian cave isopods which are found either swimming in the water column, or skimming across bottom
Figs 6-10. *Eusomalana* nomen. 6. Cephalon. 7. Clypeo-fibren with lamina dorsalis. 8. Left Md, dorsal. 9. More strongly magnified areas of left Md, with the "ylump spinose lobe". 10. Areas of right Md, (same scale, and in exactly the same position as that in fig. 9).

Figs 14-15. *Exomalopsis reptans*. Left gnathopod and peripod II (same scale), both with more strongly magnified unguis. Between them, a strongly magnified pectinate spine, most characteristic element of their armament.
Figs. 16-17. Eusalanea neptae, left pereiopods III and VII (same scale).
sediments. The specific name alludes to the creeping behaviour of the species.

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