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The terrestrial Isopoda (Crustacea, Oniscidea) of the Maldives

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Twenty-seven species of terrestrial isopods are recorded from the Maldives Islands (North Kaafu Atoll and Vaavu Atoll). One genus (*Eubelinum*) in the family Eubelidae and three species (*Styloniscus maldivensis*, *Eubelinum incertum*, and *Pseudodiploexochus indicus*) are described as new, and 26 species are newly recorded from the archipelago. *Ligia dentipes* Budde-Lund, 1885 is also recorded from Sri Lanka and Seychelles. The poorly known species *Tylos albidus* Budde-Lund, 1885 and *Platyarthrus acropyga* Chopra, 1924 are also illustrated. The composition and origin of the oniscidean fauna of the Maldives are briefly discussed.

<http://zoobank.org/urn:lsid:zoobank.org:pub:ABD0E6EA-83FE-4F61-8B81-D3C8A0B23848>

Keywords: Crustacea; Isopoda; Oniscidea; new genus; new species; Maldives Islands

Introduction

The Maldives archipelago consists of about 1200 coral islands in the Indian Ocean grouped in a double chain of 26 atolls across the equator, oriented north-south, between latitudes 7°06'30"N and 0°41'48"S, and between longitudes 72°32'30"E and 73°45'54"E. The Maldives Islands are located in the Laccadive Sea on top of a submarine mountain range, the Chagos–Maldives–Laccadive Ridge, about 670 km south-west of Sri Lanka, 595 km south-west of India, and 550 km north of Chagos Islands. Islands are in general quite small with an average area of only 1–2 km² and an average elevation of 1.5 m above mean sea level.

Little is known about the terrestrial isopods from the Maldives. Borradaile (1901) recorded six species: *Ligia exotica* Roux, 1828, *Porcellio maldivensis* n. sp., *Alloniscus maldivensis* n. sp., *Philoscia gracilis* Budde-Lund, 1885, *Philoscia* sp., and *Cubaris murina* Brandt, 1833. According to Budde-Lund (1913), only *L. exotica* and *C. murina* are correctly identified, while *P. maldivensis* probably corresponds to *Agnara madagascariensis* (Budde-Lund, 1885), and *A. maldivensis* to *Alloniscus pigmentatus* Budde-Lund, 1885. Unfortunately, it was not possible to locate Borradaile's material, so I was unable to re-examine and safely identify those specimens. However, the species are commented in the text. Ferrara and Taiti (1985) recorded *Alloniscus nicobaricus* Budde-Lund, 1885 from the Maldives.

The terrestrial isopods listed in this paper were collected by S. Taiti during three trips to the atolls of North Kaafu (North Male) and Vaavu (Felidhu) in the years 1992, 1993 and 1994. The islands investigated in each atoll with their latitudes and longitudes (datum WGS84) are the following:

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North Kaafu Atoll: Medhufinolhu (Reethi Rah) 4°30'46"N 73°22'15"E; Eriyadhoo 4°35'24"N 53°24'73"; Huraa 4°15'50"N 73°30'00"E; Kudabandos 4°35'24"N 73°24'53"E.
Vaavu Atoll: Fulidhoo 3°40'50"N 73°24'57"E; Alimathaa 3°35'37"N 73°29'52"E; Aarah 3°29'57"N 73°31'45"E; Hulhidhoo 3°29'36"N 73°31'58"E; Thinadhoo 3°29'15"N 73°32'17"E; Felidhoo 3°28'18"N 73°32'50"E; Foththeyo 3°27'16"N 73°45'31"E; Bodumohoraa 3°20'35"N 73°31'17"E; Rakeedhoo 3°18'54"N 73°28'12"E; Anbaraa 3°22'20"N 73°26'23"E; Vashugiri 3°37'48"N 73°22'40"E; Kudhiboli 3°38'12"N 73°21'55"E.

Abbreviations: MZUF, Museo di Storia Naturale dell'Università, Sezione di Zoologia "La Specola," Florence, Italy; SMNS, Staatliches Museum für Naturkunde, Stuttgart, Germany; ZMUC, Zoologisk Museum, University of Copenhagen, Denmark

Systematic account

Family Ligijidae

Genus *Ligia* Fabricius, 1798

Ligia dentipes Budde-Lund, 1885

?*Ligia exotica* Borradaile 1901: 68, 98, Budde-Lund 1913: 370.

Type material re-examined

India, Nicobar Islands: 3 ♂♂ syntypes, Pulo Milu and Nangkowri, leg. Galathea Expedition, 1846 (ZMUC CRU 762).

Material examined

North Kaafu Atoll: 1 ♂, 3 ♀♀, 3 juvs, Medhufinolhu, 18.XI.1992 (MZUF 4329); 1 ♀, Eriyadhoo, 19.XI.1992 (MZUF 4330); 5 ♂♂, 4 ♀♀, 1 juv., Huraa, 22.XI.1992 (MZUF 4331). *Vaavu Atoll:* many ♂♂ and ♀♀, Fulidhoo, 30.XI.1993 (MZUF 8942); 3 ♂♂, 3 ♀♀, 1 juv., Felidhoo, 2.XII.1993 (MZUF 8943); many ♂♂ and ♀♀, Rakeedhoo, 4.XII.1993 (MZUF 8940); many ♂♂ and ♀♀, Alimathaa, 5.XII.1993 (MZUF 8941).

Distribution

This species has a wide distribution in the Indian Ocean. It was previously known from the Nicobar Islands (Budde-Lund 1885) and the Andaman Islands (Ferrara and Taiti 1982; Santhanakumar et al. 2014). Besides the Maldives, it occurs also on Sri Lanka (1 ♂, 1 ♀, Koggala, Habaraduwa Beach, 20.XII.1980, leg. T. Osten, MZUF 1109) and the Seychelles (2 ♂♂, 2 ♀♀, Silhouette, Anse Lascars, 26.VII.1999, leg. J. Gerlach, MZUF 8944; 1 ♂, 2 ♀♀, Silhouette, La Passe, 10.VII.1999, leg. J. Gerlach, MZUF 8945).

Remarks

Borradaile (1901) recorded *L. exotica* from Mahugudu (= Maaughoodhoo), Miladamadulu Atoll (= Shaviyani Atoll) in the Maldive Islands. *Ligia exotica* from the Indian and Pacific coasts has often been misidentified, so it is most probable that Borradaile's record refers to *L. dentipes*. This species has been redescribed and illustrated by Ferrara and Taiti (1982) on specimens from the Andaman Islands. Re-examination of the type material from the Nicobar Islands confirms the validity of the redescription of *L. dentipes*. The species is easily distinguished by the twisted conical part of the male pleopod 2 endopodite.

Family **Tylidae**Genus *Tylos* Audouin, 1826*Tylos albidus* Budde-Lund, 1885

(Figures 1 and 2)

Tylos albidus; Schmalfuss & Vergara, 2000: 3; Schmalfuss 2003: 322.*Type material re-examined*

India, Nicobar Islands: three specimens syntypes, leg. Galathea Expedition, 1846 (ZMUC CRU 1688).

Material examined

North Kaafu Atoll: Kudabandos, 6 ♂♂, 10 ♀♀, 22.XI.1992 (MZUF 4339). *Vaavu Atoll*: 2 ♀♀, 2 juvs, Kudhiboli, 28.XI.1993 (MZUF 9108); 3 ♀♀, Bodumohoraa, 6.XII.1993 (MZUF 9105); 1 ♂, 7 ♀♀, 1 juvs, Thinadho, 1–3.XII.1993 (MZUF 9107); 11 ♂♂, 10 ♀♀, Aarah, 29.XI.1993 (MZUF 9102); 3 ♂♂, 7 ♀♀, Foththeyo, 8.XII.1993 (MZUF 9103); 2 ♂♂, 12 ♀♀, Vashugiri, 28.XI.1993 (MZUF 9101); 1 ♂, 7 ♀♀, Felidho, 2.XII.1993 (MZUF 9106); 13 ♂♂, 12 ♀♀, Anbaraa, 2.XI.1994 (MZUF 9104).

Distribution

Previously known from the Nicobar Islands. Kwon (1993) states that one of the syntypes (a female) of *T. granuliferus* Budde-Lund, 1885 from Borneo probably belongs to *T. albidus*. New record for the Maldives.

Remarks

Tylos albidus was described by Budde-Lund (1885) after three specimens (here re-examined) collected during the first Galathea Expedition to the Nicobar Islands. Budde-Lund (1906) briefly redescribed this species on the basis of the syntypes adding some illustrations. No other records are known about this species. As Budde-Lund's description is insufficient for a safe identification, a complete series of illustrations is provided here (Figures 1 and 2) based on the specimens from the Maldives which, after comparison, are morphologically indistinguishable from the type specimens. *Tylos albidus* belongs to the Indo-Pacific group of species together with *T. minor* Dollfus, 1893, *T. opercularis* Budde-Lund, 1885, *T. nudulus* Budde-Lund, 1906, and *T. granuliferus* Budde-Lund, 1885. It is characterized by the distinctly granulated dorsum, absence of paramedian tubercles on the telson, cephalon with frontal process not pointed posteriorly, epimera of pereonites 2–4 triangular, reduced point on the basis of pereopod 1, and strong enlargement of pereopods 5–7 ischium.

Family **Styloniscidae**Genus *Styloniscus* Dana, 1852*Styloniscus maldivensis* n. sp.

(Figures 3 and 4)

Material examined

Vaavu Atoll: ♂ holotype, 12 ♂♂, 3 ♀♀ paratypes, Felidho, 2.XII.1993 (MZUF 7702); 2 ♂♂, 2 ♀♀ paratypes, Hulhidho, 29.XI.1993 (MZUF 7703).

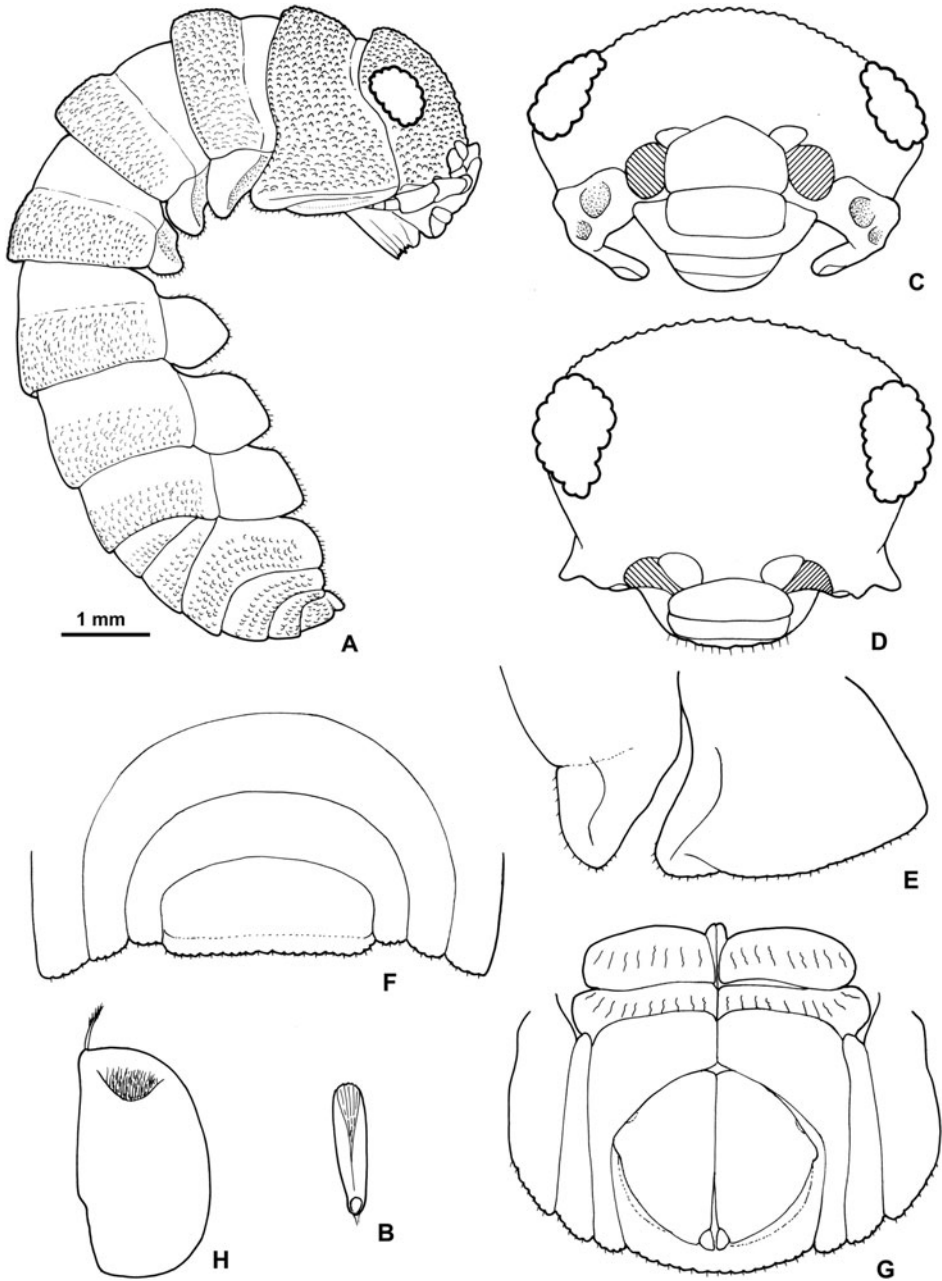


Figure 1. *Tylos albidus*. ♂ from Kudabandos: (A) adult specimen, lateral; (B) dorsal scale-seta; (C) cephalon, frontal; (D) cephalon, dorsal; (E) lateral side of pereonites 1 and 2, ventral; (F) pleonites 3–5 and telson, dorsal; (G) pleon, ventral; (H) antennule.

Description

Maximum length: ♂ and ♀, 1.7 mm. Pink color *in vivo*, colorless after conservation in alcohol. Body ovoid with pleon narrower than pereon (Figure 3A). Vertex and pereon distinctly granulated, pleon and telson smooth; dorsal surface with two types of scale-

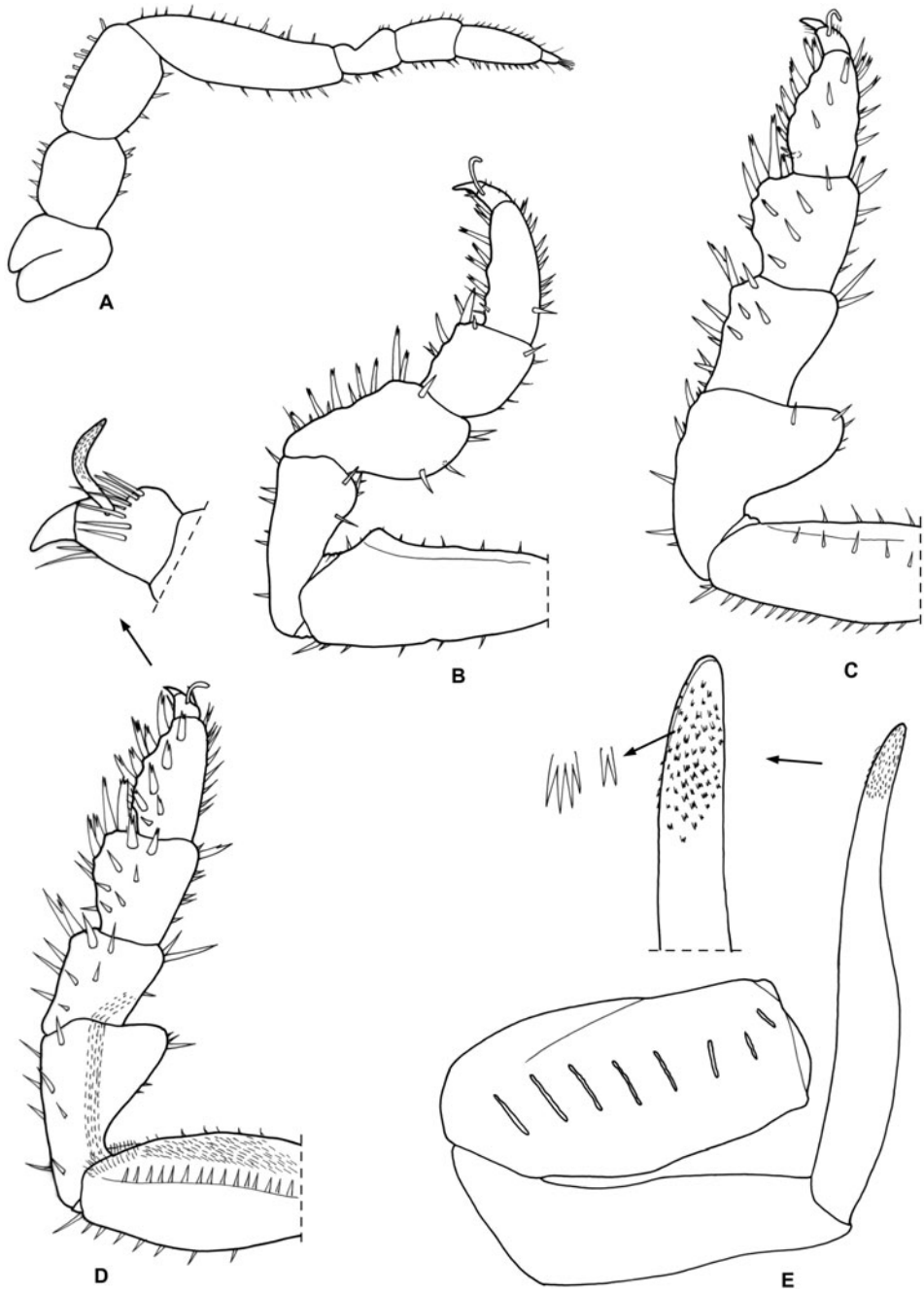


Figure 2. *Tylos albidus*. ♂ from Kudabandos: (A) antenna; (B) pereopod 1; (C) pereopod 5; (D) pereopod 7; (E) pleopod 2.

setae: lanceolate (Figure 3B) and fan-shaped (Figure 3C). Cephalon with obtuse frontal lobe slightly protruding compared with quadrangular lateral lobes; eye consisting of three small ommatidia in a triangle. Pleonites 3–5 with reduced posterior points. Telson

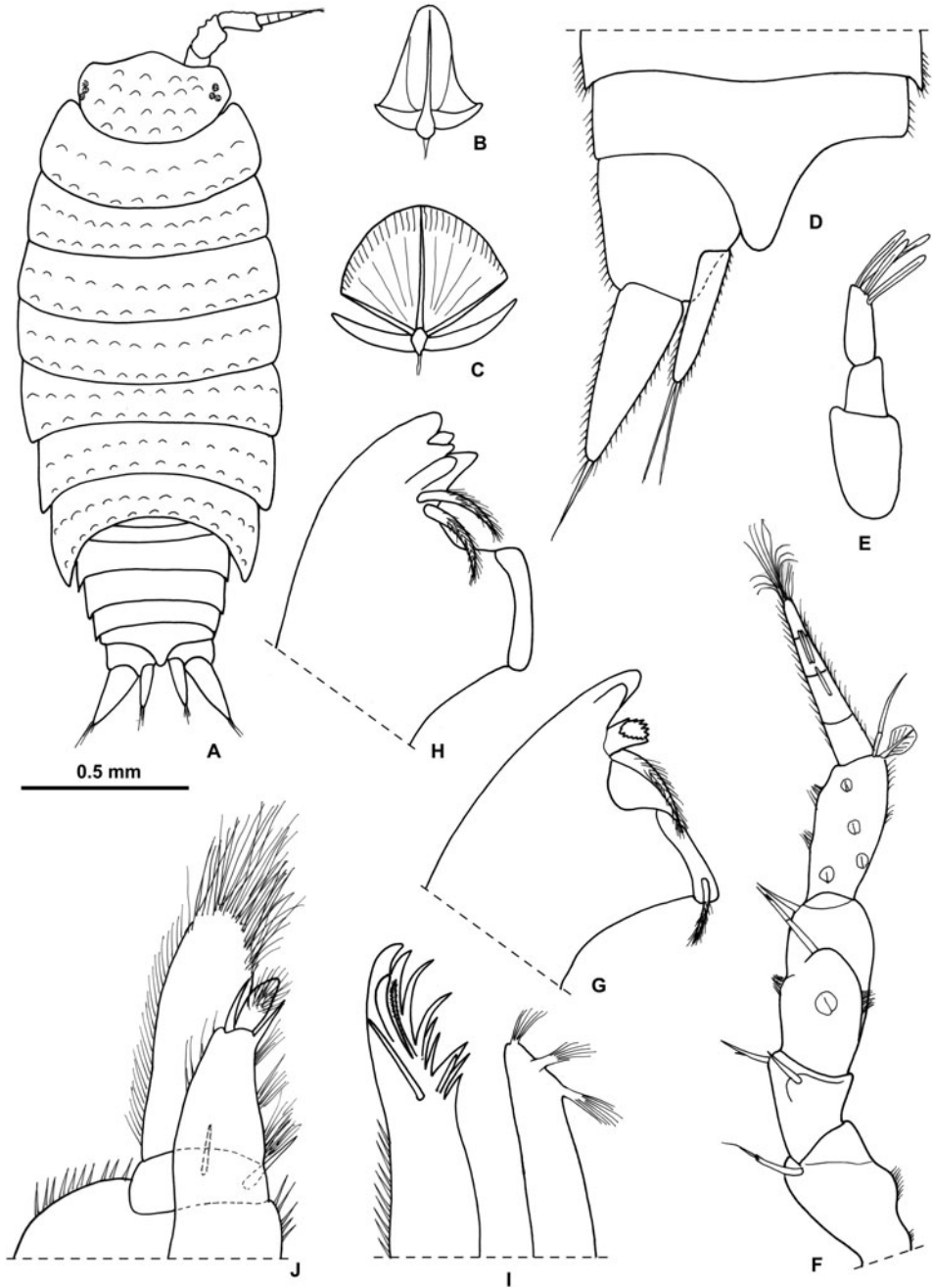


Figure 3. *Styloniscus maldivensis* n. sp. ♂ paratype from Felidhoo: (A) adult specimen, dorsal; (B and C) dorsal scale-setae; (D) pleonite 5, telson and left uropod; (E) antennule; (F) antenna; (G) right mandible; (H) left mandible; (I) maxillule; (J) maxilliped.

(Figure 3D) with very narrow triangular distal part, narrowly rounded apex. Antennule (Figure 3E) with second article shorter than first and third; third article with four petaliform aesthetascs at apex. Antenna (Figure 3F) with flagellum longer than fifth article

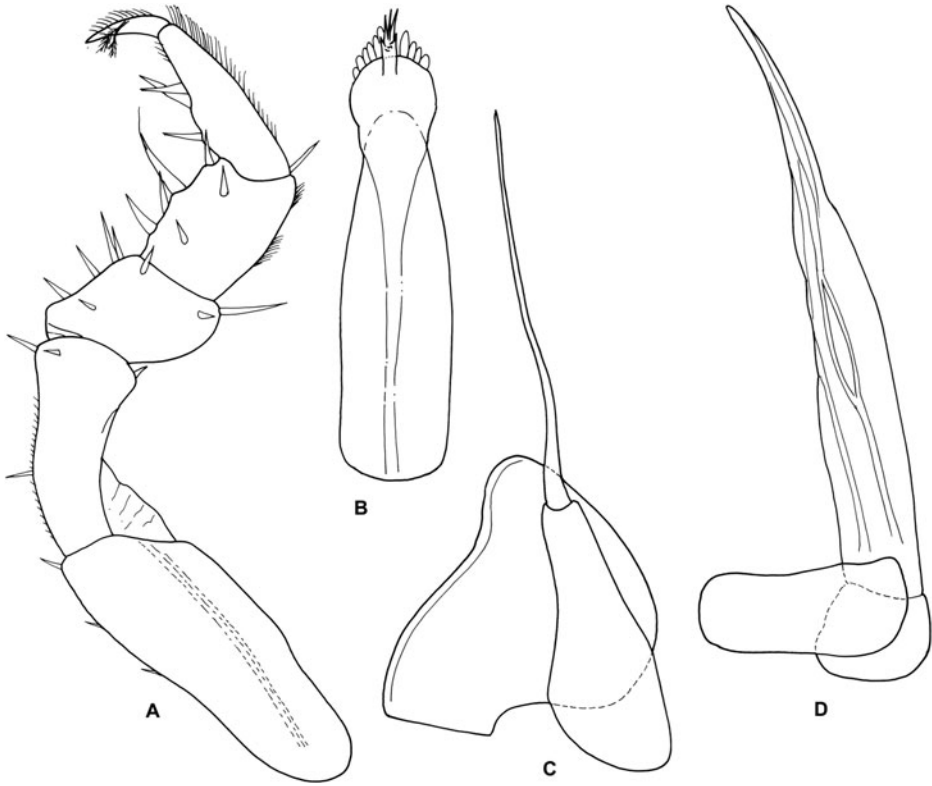


Figure 4. *Styloniscus maldivensis* n. sp. ♂ paratype from Felidhoo: (A) pereopod 7; (B) genital papilla; (C) pleopod 1; (D) pleopod 2.

of peduncle; flagellum of four articles with the second and third bearing one and two aesthetascs, respectively. Right mandibles (Figure 3G) with one free penicil and a penicil on molar process; left mandible (Figure 3H) with two free penicils. Maxillule (Figure 3I) outer branch with 11 simple teeth and two long stalks; inner branch with three apical penicils. Maxilliped (Figure 3J) endite with a stout apical penicil; basal article of the palp with two setae.

Male. Pereopod 7 (Figure 4A) ischium with sternal margin slightly sinuous; merus quadrangular, shorter and wider than carpus. Genital papilla (Figure 4B) with rounded distal part bearing a row of lamellar scales on distal margin. Pleopod 1 (Figure 4C) exopodite as wide as long, with short, rounded posterior point, outer margin slightly sinuous; endopodite with flagelliform distal segment, about 1.5 times longer than basal one. Pleopod 2 (Figure 4D) exopodite very short, rectangular, about three times wider than long; endopodite with distal segment about eight times longer than basal one, with tapering apical part slightly bent outwards, acute apex.

Etymology

The species is named after the country of origin, the Maldives.

Remarks

The new species is characterized by the distinct tuberculation on the cephalon and pereon, very narrow distal part of the telson, antennule with four petaliform aesthetascs on the

distal article, shape of the genital papilla, male pereopod 7, and pleopod 1. It shows its closest affinities with *Styloniscus mauritiensis* (Barnard 1936) from Mauritius and Hawaii (Taiti and Ferrara 1983, 1991), but most probably widely distributed in the Indo-Pacific area. *Styloniscus maldivensis* is readily distinguishable from *S. mauritiensis* by the male pereopod 7 ischium with sinuous sternal margin and merus with no rounded lobe, shape of the distal part of the genital papilla, and the male pleopod 1 exopodite with sinuous instead of straight outer margin.

Family **Olibrinidae**

Genus *Olibrinus* Budde-Lund, 1913

Olibrinus antennatus (Budde-Lund, 1902)

Material examined

North Kaafu Atoll: many ♂♂ and ♀♀, Huraa, 22.XI.1992 (MZUF 4341). *Vaavu Atoll*: 9 ♂♂, 19 ♀♀, Rakeedhoo, 4.XII.1993 (MZUF 9046); 8 ♂♂, 11 ♀♀, Felidhoo, 2.XII.1993 (MZUF 9045).

Distribution

This amphibious species is common along the coasts of the Indian Ocean where it occurs in mangrove areas and under coral rocks. It is recorded with certainty from the Red Sea, Djibouti, Somalia, Socotra Island, Chagos Islands, Mozambique, Madagascar, Nicobar Islands, and Malay Peninsula. New record for the Maldives.

Remarks

Olibrinus antennatus and its complex synonymy have been discussed in Taiti and Ferrara (2004). From the original description and figures, it is very probable that also *Olibrinus ormaraensis* Kazmi, 2004 from Pakistan is a junior synonym of *O. antennatus*.

Family **Detonidae**

Genus *Armadilloniscus* Uljanin, 1875

Armadilloniscus quadricornis Vandel, 1970

Material examined

North Kaafu Atoll: many ♂♂ and ♀♀, Huraa, 22.XI.1992 (MZUF 4336). *Vaavu Atoll*: 6 ♂♂, 2 ♀♀, 2 juvs, Felidhoo, 2.XII.1993 (MZUF 8980); many ♂♂ and ♀♀, Anbaraa, 2.XII.1994 (MZUF 8979).

Distribution

This halophilic species was previously known from Malaysia, Indonesia, New Guinea, and Solomon Archipelago. New record for the Maldives.

Remarks

For illustrations and comments on this and the following species of *Armadilloniscus*, see Taiti and Ferrara (1989).

Armadilloniscus mirabilis Ferrara, 1974*Material examined*

Vaavu Atoll: many ♂♂ and ♀♀, Fulidhoo, 30.XI.1993 (MZUF 8969); 6 ♂♂, 8 ♀♀, 3 juvs, Thinadhoo, 1–3.XII.1993 (MZUF 8948); many ♂♂ and ♀♀, Bodumohoraa, 6.XII.1993 (MZUF 8947); 1 ♀, Anbaraa, 2.XII.1994 (MZUF 8946).

Distribution

Previously known from Somalia and Malaysia. New record for the Maldives.

Armadilloniscus biltoni Taiti & Ferrara, 1989*Material examined*

Vaavu Atoll: 11 ♂♂, 11 ♀♀, Kunavashi, 7.XII.1993 (MZUF 9013).

Distribution

This species was previously known only from the Togian Islands (Sulawesi, Indonesia). New record for the Maldives.

Family **Incertae sedis**Genus *Buchnerillo* Verhoeff, 1942*Remarks*

The genus *Buchnerillo* was included by Verhoeff (1942) and Vandel (1945, as *Lereboulletia* n. gen.) in the section Synocheta, family Buddelundiellidae. Vandel (1960) established the synonymy between *Buchnerillo* and *Lereboulletia*, and created for *Buchnerillo* the new subfamily Buchnerilloninae within the family Buddelundiellidae. Taiti and Ferrara (1991; 1996) considered *Buchnerillo* to belong to an “undetermined family” while Tabacaru (1993) pointed out that this genus, considering the structure of mouth parts and the eye with more than three ommatidia, is neither related to *Buddelundiella* Silvestri, 1897, nor to any of the other Synocheta. This opinion was followed also by Schmalfuss (2003) who suggested that the genus might be included in the family Detonidae, section Crinocheta, on the basis of the eyes with more than three ommatidia, structure of antennule, antenna, maxillula, and pereopods. Until a detailed study on this genus, using also molecular tools, is performed to clarify its systematic position, I prefer to keep the genus *Buchnerillo* as incertae sedis. At present, the genus includes only two species, *B. litoralis* Verhoeff, 1942 from the Mediterranean coasts, Madeira, and Venezuela (this last record by Paoletti and Stinner 1989 needs to be confirmed), and *Buchnerillo oceanicus* (see below).

Buchnerillo oceanicus Ferrara, 1974*Material examined*

Vaavu Atoll: 1 ♀, Kudhiboli, 28.XI.1993 (MZUF 7704); 3 ♀♀, Fulidhoo, 30.XI.1993 (MZUF 7705); 4 ♂♂, 3 ♀♀, Thinadhoo, 1–3.XII.1993 (MZUF 7706); 1 ♂, Bodumohoraa, 6.XII.1993 (MZUF 7707).

Distribution

Buchnerillo oceanicus was known with certainty only from the southern coast of Somalia. New record for the Maldives.

Family **Alloniscidae**

Genus *Alloniscus* Dana, 1854

Alloniscus pigmentatus Budde-Lund, 1885

Material examined

Vaavu Atoll: many ♂♂ and ♀♀, Rakeedhoo, 4.XII.1993 (MZUF 9050); many ♂♂ and ♀♀, Felidhoo, 2.XII.1993 (MZUF 9048); 2 ♂♂, 11 ♀♀, 1 juvs, Anbaraa, 2.XII.1994 (MZUF 9049).

Distribution

The species is known with certainty from Madagascar, Aldabra Island, Chagos, Comoro, Mozambique, and southern China (Hainan Dao). New record for the Maldives.

Remarks

For illustrations and comments on this species, see Ferrara and Taiti (1985) and Kwon and Taiti (1993). Borradaile (1901: 99, Figure 23) described the new species *A. maldivensis* from Hedufuri, Mahlos Atoll, Maldive Islands. From this description, it is not possible to recognize the species. According to Budde-Lund (1913), it might be a junior synonym of *A. pigmentatus* while Ferrara and Taiti (1985) tentatively considered *A. maldivensis* as a possible synonym of *A. nicobaricus* Budde-Lund, 1885. As both *A. pigmentatus* and *A. nicobaricus* are present on the Maldives, it is impossible to attribute *A. maldivensis* to one of these two species without the re-examination of Borradaile's material. Due to these uncertainties, Schmalfuss (2003) considered *A. maldivensis* as a nomen dubium.

Alloniscus nicobaricus Budde-Lund, 1885

Alloniscus nicobaricus; Ferrara and Taiti 1985: 295; Schmalfuss 2003: 12.

Material examined

Vaavu Atoll: many ♂♂ and ♀♀, Fulidhoo, 30.XI.1993 (MZUF 9042); 2 ♂♂, 4 ♀♀, 5 juvs, Thinadhoo, 1–3.XII.1993 (MZUF 9041).

Previous records

Maldive Islands (Ferrara and Taiti 1985).

Distribution

Known from the Maldives, north-eastern India, Nicobar Islands, and Andaman Islands.

Remarks

This species has been illustrated in Ferrara and Taiti (1982, as *A. pigmentatus*) while its taxonomic status has been discussed in Ferrara and Taiti (1985).

Family **Stenoniscidae**

Genus *Metastenoniscus* Taiti & Ferrara, 1982

Metastenoniscus osellai Taiti & Ferrara, 1982

Material examined

North Kaafu Atoll: 6 ♀♀, Kudabandos, 22.XI.1992 (MZUF 4342). *Vaavu Atoll*: 6 ♂♂, 14 ♀♀, Fulidhoo, 30.XI.1993 (MZUF 9019); 7 ♀♀, Fulidhoo, 1.XII.1994 (MZUF 9023); 6 ♀♀, Felidhoo, 2.XII.1993 (MZUF 9020); 4 ♂♂, 11 ♀♀, Thinadhoo, 1–3.XII.1993 (MZUF 9022); many ♂♂ and ♀♀, Foththeyo, 8.XII.1993 (MZUF 9021).

Distribution

Previously known from the Andaman Islands and Indonesia (Bali). New record for the Maldives.

Family **Halophilosciidae**

Genus *Littorophiloscia* Hatch, 1947

Littorophiloscia amphindica Taiti & Ferrara, 1986

Material examined

Vaavu Atoll: many ♂♂ and ♀♀, Hulhidhoo, 29.XI.1993 (MZUF 9017); many ♂♂ and ♀♀, Felidhoo, 2.XII.1993 (MZUF 9016); many ♂♂ and ♀♀, Rakeedhoo, 4.XII.1993 (MZUF 9015); 2 ♂♂, 1 ♀, Kunavashi, 7.XII.1993 (MZUF 9018); many ♂♂ and ♀♀, Hulhidhoo, 29.XI.1994 (MZUF 9014).

Distribution

Known from Tanzania (Zanzibar), Comoro Islands, Maldives, Indonesia (Bali), and Taiwan. New record for the Maldives.

Remarks

Borradaile (1901) recorded *P. gracilis* from Mahlos and Addu atolls, and *Philoscia* sp. from Hedufuri, Mahlos Atoll. Most probably these specimens refer to species of Halophilosciidae or Philosciidae recorded in this paper.

Littorophiloscia tropicalis Taiti & Ferrara, 1986

Material examined

North Kaafu Atoll: 1 ♀, Medhufinolhu, 18.XI.1992 (MZUF 4333); 1 ♀, Huraa, 22.XI.1992 (MZUF 4332). *Vaavu Atoll*: 2 ♂♂, 3 ♀♀, Kudhiboli, 28.XI.1993 (MZUF 8989).

Distribution

Littorophiloscia tropicalis has a circumtropical distribution. It is recorded from the USA (Florida), Belize, Mexico, Venezuela, Brazil, Ascension Island, St. Helena Island, Cameroon, Sudan, Somalia, Socotra Archipelago, and India. New record for the Maldives.

Remarks

The female specimens from Medhufinolhu and Huraa cannot be identified with certainty. Considering the size, general shape of the body, particularly the shape of the telson, and the structure of the dorsal scale-setae, they most probably belong to *L. tropicalis*.

Littorophiloscia pallida Taiti & Ferrara, 1986

Material examined

Vaavu Atoll: 4 ♂♂, 9 ♀♀, Bodumohoraa, 6.XII.1993 (MZUF 8990).

Distribution

Previously known only from Thailand (eastern Malay Peninsula). New record for the Maldives.

Family **Philosciidae**

Genus ***Burmoniscus*** Collinge, 1914

Burmoniscus acutitelson (Ferrara & Taiti, 1983)

Material examined

Vaavu Atoll: 15 ♂♂, 21 ♀♀, Hulhidhoo, 29.XI.1993 (MZUF 8999).

Distribution

Previously known only from the Seychelles. New record for the Maldives.

Burmoniscus javanensis (Richardson Searle, 1922)

Material examined

Vaavu Atoll: 1 ♂, Fulidhoo, 30.XI.1993 (MZUF 8977); 1 ♀, same locality, 1.XII.1994 (MZUF 8974); 4 ♂♂, 11 ♀♀, 9 juvs, Felidhoo, 2.XII.1993 (MZUF 8975, 8976); 1 ♂, 1 ♀, same data (SMNS 12124); many ♂♂ and ♀♀, Thinadhoo, 1–3.XII.1993 (MZUF 8973, 8978).

Distribution

This species has a wide distribution in the tropical area of the Indian and Pacific oceans. It is known from Réunion Island, India, Indonesia (Java, Bali, and Sulawesi), Malaysia, New Guinea, southern China, Hong Kong, and Taiwan. New record for the Maldives.

Burmoniscus bartolozzii* Taiti & Manicastro, 1988Material examined*

Vaavu Atoll: 2 ♂♂, Vashugiri, 28.XI.1993 (MZUF 8983); many ♂♂ and ♀♀, Hulhidhoo, 29.XI.1993 (MZUF 8985); many ♂♂ and ♀♀, Felidhoo, 2.XII.1993 (MZUF 8982, 8984); many ♂♂ and ♀♀, Bodumohoraa, 6.XII.1993 (MZUF 8986); many ♂♂ and ♀♀, Thinadhoo, 1–3.XII.1993 (MZUF 8981, 8987); many ♂♂ and ♀♀, Foththeyo, 8.XII.1993 (MZUF 8988).

Distribution

Previously known from Sri Lanka. New record for the Maldives.

Burmoniscus meeusei* (Holthuis, 1947)Material examined*

Vaavu Atoll: 2 ♂♂, 3 ♀♀, 3 juvs, Felidhoo, 2.XII.1993 (MZUF 8972); 5 ♂♂, 8 ♀♀, 7 juvs, Thinadhoo, 1–3.XII.1993 (MZUF 8970, 8971).

Distribution

This species was described on specimens collected in greenhouses of the Royal Botanic Garden at Kew, England, and then it has been recorded from Taiwan, Hawaii Islands and Brazil. New record for the Maldives.

Genus ***Anchiphiloscia*** Stebbing, 1908***Anchiphiloscia pilosa*** (Budde-Lund, 1913)*Material examined*

North Kaafu Atoll: 1 ♂, Medhufinolhu, 18.XI.1992 (MZUF 4337). *Vaavu Atoll*: 4 ♀♀, Hulhidhoo I., 29.XI.1993 (MZUF 8967); 4 ♂♂, 14 ♀♀, 6 juvs, Hulhidhoo, 29.XI.1994 (MZUF 8968); 6 ♂♂, 11 ♀♀, Thinadhoo, 1–3.XII.1993 (MZUF 8965, 8966).

Distribution

This species is known from the Chagos Islands, West Malaysia, Indonesia (Java, Bali, and Krakatau), and Hawaii Islands. It has been recorded also from greenhouses in Amsterdam. New record for the Maldives.

Family **Platyarthridae**Genus ***Platyarthrus*** Brandt, 1833***Platyarthrus acropyga*** Chopra, 1924

(Figure 5)

Material examined

North Kaafu Atoll: 1 ♂, Kudabandos, 22.XI.1992 (MZUF 4343). *Vaavu Atoll*: 2 ♂♂, 2 ♀♀, Vashugiri, 28.XI.1993 (MZU 9002); 1 ♀, same data (SMNS 12127).

Distribution

Previously known from north-eastern India. New record for the Maldives.

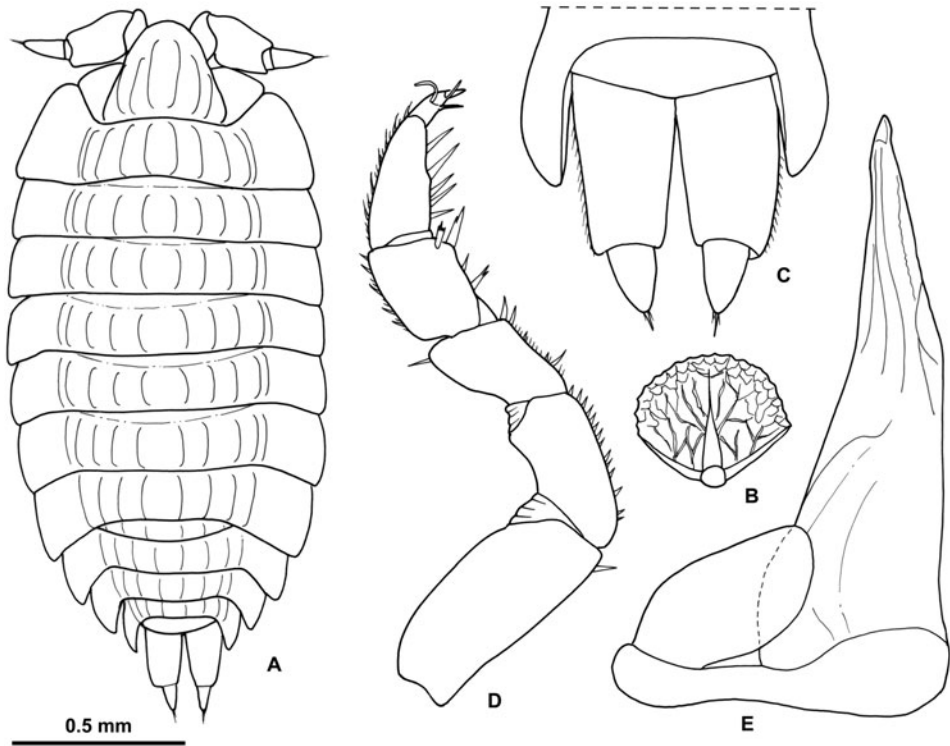


Figure 5. *Platyarthrus acropyga*. ♀ from Vashugiri: (A) adult specimen, dorsal; (B) dorsal scale-seta; (C) pleonite 5, telson and uropods. ♂ from Vashugiri: (D) pereopod 7; (E) pleopod 1.

Remarks

These specimens (about 1.7 mm long) are identified as *P. acropyga* described from Barkuda Island, north-eastern India, as they correspond in every detail to the original description given by Chopra (1924). The main diagnostic characters of this species are illustrated in Figure 5 for future recognition. *Platyarthrus acropyga* seems to belong to the *schoblii* group, and shows affinities with *P. almanus* Verhoeff, 1949 from western and southern Turkey, Lebanon and northern Israel. The presence of an apparently native species of the genus *Platyarthrus* in the Indian subcontinent is most surprising. The genus, in fact, is mostly distributed in the Mediterranean subregion, with the easternmost record from south-western Turkmenistan (*P. mesasiaticus* Borutzky, 1976). As already pointed out by Vandel (1962: 443), at the moment it is not possible to say whether this species is native or introduced into India. Its presence on the Maldives is probably due to introduction.

Family Trachelipodidae

Genus *Nagurus* Holthuis, 1949

Nagurus nanus (Budde-Lund, 1908)

Material examined

North Kaafu Atoll: 12 ♂♂, 6 ♀♀, Medhufinolhu, 18.XI.1992 (MZUF 4327); 1 ♂, Kudabandos, 22.XI.1992 (MZUF 4328). *Vaavu Atoll*: 6 ♂♂, 2 ♀♀, Fulidhoo, 30.XI.1993 (MZUF 9024); 1 ♀, Felidhoo I., 2.XII.1993 (MZUF 9025).

Distribution

Pantropical.

Nagurus kensleyi Ferrara & Taiti, 1985*Material examined*

North Kaafu Atoll: 3 ♂♂, 2 ♀♀, 1 juv., Medhufinolhu, 18.XI.1992 (MZUF 4325); 5 ♂♂, 2 ♀♀, 9 juvs, Kudabandos, 22.XI.1992 (MZUF 4326). *Vaavu Atoll*: 1 ♂, 1 juv., Kudhiboli, 28.XI.1993 (MZUF 8960); many ♂♂ and ♀♀, Fulidhoo, 30.XI.1993 (MZUF 8962); 2 ♂♂, 2 ♀♀, Felidhoo, 2.XII.1993 (MZUF 8959); 2 ♂♂, 1 ♀, Anbaraa, 2.XII.1994 (MZUF 8961).

Distribution

Previously known only from Aldabra Island. New record for the Maldives.

Family **Porcellionidae**

Genus *Porcellionides* Miers, 1877

Porcellionides pruinosus (Brandt, 1833)*Material examined*

North Kaafu Atoll: 3 ♂♂, Medhufinolhu, 18.XI.1992 (MZUF 4338).

Distribution

Cosmopolitan species of Mediterranean origin. New record for the Maldives.

Family **Agnaridae**

Genus *Agnara* Budde-Lund, 1908

Agnara taprobanica Ferrara & Argano, 1989*Material examined*

North Kaafu Atoll: many ♂♂ and ♀♀, Medhufinolhu, 18.XI.1992 (MZUF 4340). *Vaavu Atoll*: many ♂♂ and ♀♀, Fulidhoo, 30.XI.1993 (MZUF 8993).

Distribution

Known from Sri Lanka and the Maldives.

Remarks

Borradaile (1901: 99, Fig. 22) described *P. maldivensis* from Mafaro, Miladumadulu Atoll (= Maafaru, Noonu Atoll), Maldive Islands, a species that Budde-Lund (1913: 370) tentatively synonymized with *A. madagascariensis* (Budde-Lund, 1885). Considering that only *A. taprobanica* has been collected on these islands, it is possible that *P. maldivensis* corresponds to this species. The re-examination of type specimens of *P. maldivensis* is necessary to definitely clarify the taxonomy of this species.

Family **Eubelidae**Genus ***Eubelinum* n. gen.**

Type-species: *Eubelinum incertum* n. sp.

Diagnosis

Minute size. Animals able to roll up into a perfect ball, vertical epimera. Dorsum with inconspicuous triangular scale-setae. One line of noduli laterales per side inserted more or less at the same distance from the lateral margin of pereonites. Cephalon with no frontal margin and no interocular line; small and rounded lateral lobes. Pereonite 1 with sulcus arcuatus wide and slightly arched, distant from the lateral margin and not reaching the anterior margin of the segment; lateral part slightly swollen; a schisma at posterolateral corners. Pereonite 2 ventrally with a transversal thickening on epimeron. Telson with trapezoidal distal part. Antennule with third segment apically truncate and bearing petaliform aesthetascs. Antennal flagellum with two articles. Mandible with molar penicil semidichotomized. Maxillule with outer branch bearing 4 + 5 teeth, all apically not indented; inner branch with two long penicils. Maxilliped with two triangular points on endite distal margin. All pleopods with monospiracular covered lungs and no visible perispiracular area. Uropod with very small exopodite dorsally inserted.

Etymology

The name is the diminutive of *Eubelum* Budde-Lund, 1885, type genus of the family Eubelidae. It refers to the small size of the type species of the genus. Gender neuter.

Remarks

For the structure of the antenna, buccal pieces, and number and type of the pleopodal lungs, *Eubelinum* shows affinities with the genera *Xeroniscus* Ferrara & Taiti, 1990, *Omanodillo* Taiti, Ferrara & Davolos, 2000, and *Somalodilloides* Taiti & Ferrara, 2004, all genera distributed in the Horn of Africa and the Arabian Peninsula. The new genus is readily distinguished from *Xeroniscus* and *Omanodillo* in having a schisma at the posterolateral corner of pereonite 1; from *Somalodilloides* by the cephalon with no frontal shield and frontal margin, sulcus arcuatus not reaching the anterior margin of pereonite 1, the epimeron of pereonite 2 ventrally with a transversal thickening instead of a rounded lobe, the antennule with a truncate apical margin, and the pleopodal lungs without perispiracular area.

***Eubelinum incertum* n. sp.**

(Figures 6 and 7)

Material examined

Vaavu Atoll: ♂ holotype, 12 ♂♂, 31 ♀♀ paratypes, Hulhidhoo, 29.XI.1994 (MZUF 9439); 1 ♀ paratype, same locality, 29.XI.1993 (MZUF 9440).

Description

Maximum dimensions: ♂, 2.0 mm × 0.7 mm; ♀, 2.5 mm × 0.9 mm. Body very convex with smooth dorsum (Figure 6A). Colorless. Dorsum with small, scattered triangular scale-setae about twice as wide as long (Figure 6B). Cephalon (Figure 6C,D) about twice

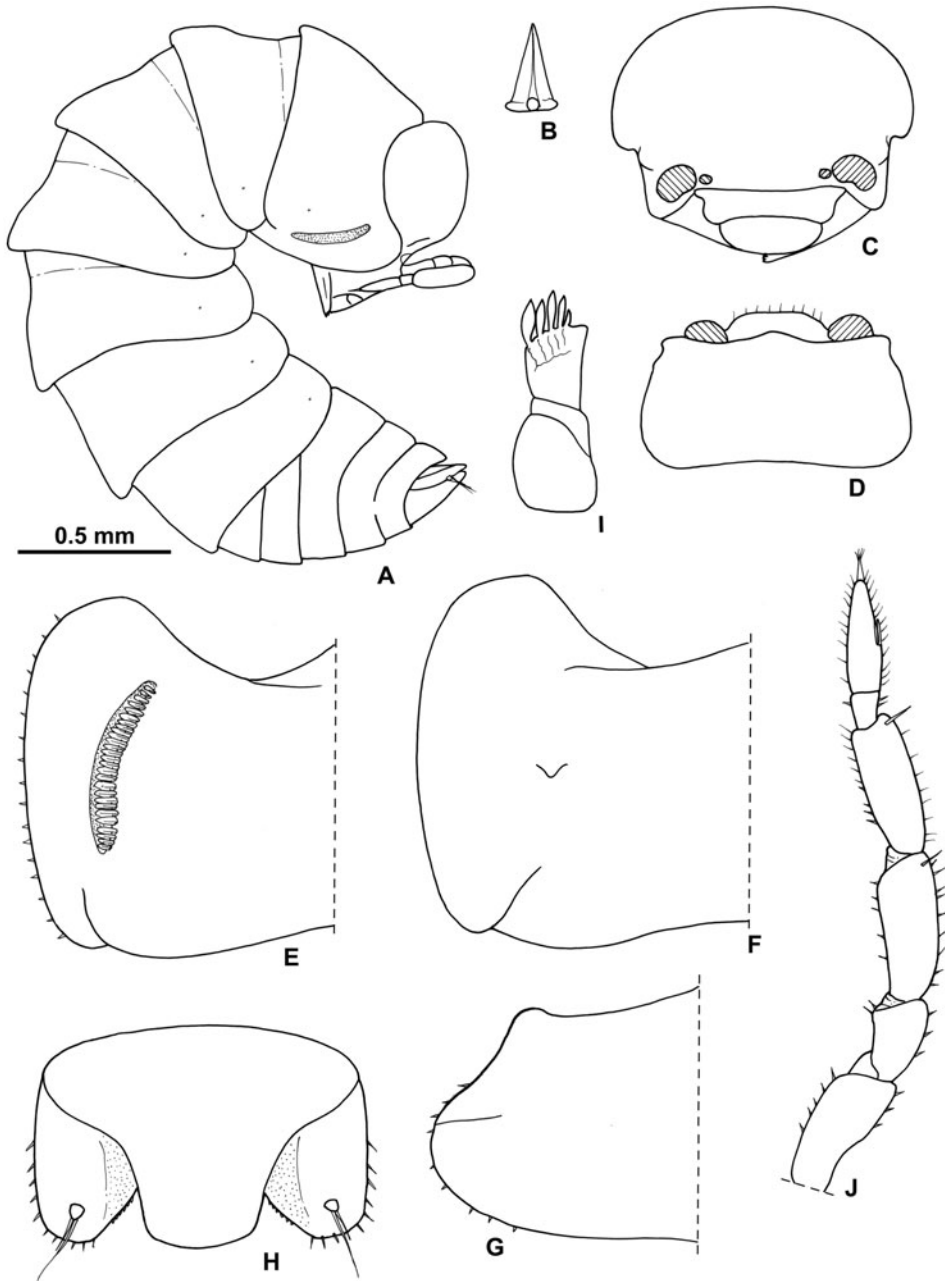


Figure 6. *Eubelinum incertum* n. gen., n. sp. ♀ paratype from Hulhidhoo: (A) adult specimen, lateral; (B) dorsal scale-seta; (C) cephalon, frontal; (D) cephalon, dorsal; (E) left side of pereonite 1, dorsal; (F) right side of pereonite 1, ventral; (G) right side of pereonite 2, ventral; (H) telson and uropods, dorsal; (I) antennule; (J) antenna.

as long as wide, with profrons slightly protruding frontwards; eyes absent. Pereonite 1 (Figure 6E,F) with anterior corners broadly rounded, sulcus arcuatus covered by a line of scales, schisma with rounded lobes of subequal length. Pereonites 2 (Figure 6G), 3 and 4

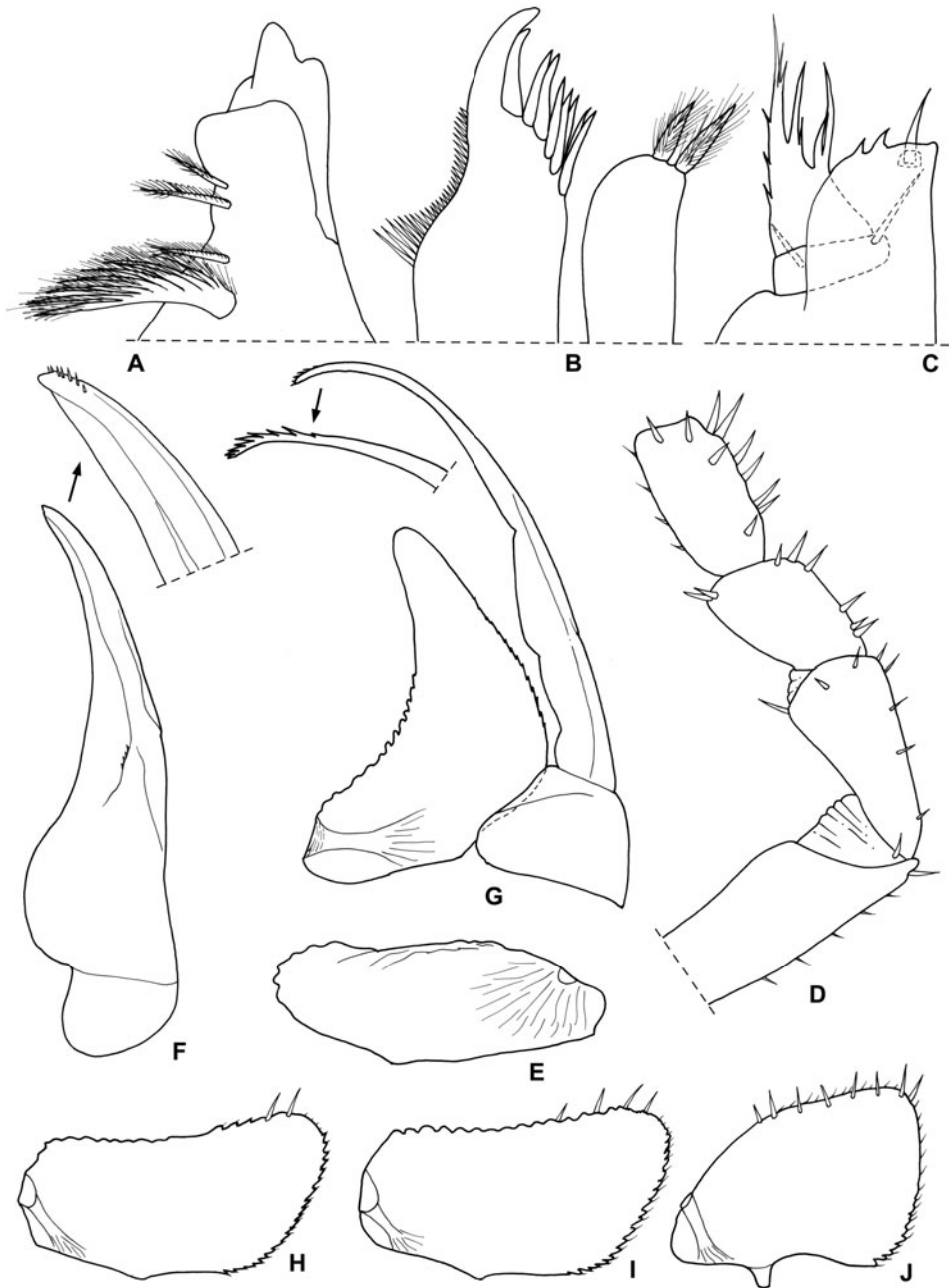


Figure 7. *Eubelinum incertum* n. gen., n. sp. ♂ paratype from Hulhidhoo: (A) left mandible; (B) maxillule; (C) maxilliped; (D) pereopod 7; (E) pleopod 1 exopodite; (F) pleopod 1 endopodite; (G) pleopod 2; (H) pleopod 3 exopodite; (I) pleopod 4 exopodite; (J) pleopod 5 exopodite.

with rounded epimera. Telson (Figure 6H) almost 1.5 times wider than long, with sinuous lateral margins and slightly convex apex. Antennule (Figure 6I) with second segment much shorter than first and third; apex with five aesthetascs. Antenna (Figure 6J) with second article of flagellum three times as long as first, equipped with 2–3 aesthetascs.

Right mandible with 1 + 1 penicils, left mandible (Figure 7A) with 2 + 1 penicils. Maxillule (Figure 7B) outer branch with sinuous outer margin; inner branch with rounded apex and no posterior point. Maxilliped (Figure 7C) endite with anteromedial corner at right angle, basal article of palp with two long setae. Uropods (Figure 6H) with small exopodite, as wide as long, bearing two long apical setae.

Male. Pereopods without distinct sexual specializations. Pereopod 7 (Figure 7D) ischium with sternal margin straight. Pleopod 1 exopodite (Figure 7E) reniform, about three times as wide as long, without posterior point; endopodite (Figure 7F) with distal part slightly bent outwards, with some short subapical spines. Pleopod 2 (Figure 7G) endopodite much longer than exopodite, equipped with some denticles on the apical part. Pleopods 3–5 exopodites as in Figure 7H–J.

Etymology

Latin *incertus* = uncertain. The name refers to the uncertain geographical origin of the species.

Remarks

Certainly, this new species is not autochthonous in the Maldives. Considering the affinities of the genus, its country of origin is probably East Africa or the Arabian Peninsula.

Family **Armadillidae**

Genus *Cubaris* Brandt, 1833

Cubaris murina Brandt, 1833

Cubaris murinus; Borradaile, 1901: 100.

Cubaris murina; Budde-Lund, 1913: 370.

Material examined

North Kaafu Atoll: many ♂♂ and ♀♀, Medhufinolhu, 18.XI.1992 (MZUF 4335); 1 ♂, Kudabandos, 22.XI.1992 (MZUF 4334). *Vaavu Atoll*: 1 ♂, 2 ♀♀, Hulhidhoo, 29.XI.1993 (MZUF 9062); 1 ♂, 1 ♀, Fulidhoo, 30.XI.1993 (MZUF 9060); 1 ♂, 3 ♀♀, Felidhoo, 2.XII.1993 (MZUF 9063); 2 ♂♂, 5 ♀♀, 5 juvs, Thinadhoo, 1–3.XII.1993 (MZUF 9064); 1 ♂, Alimathaa, 5.XII.1993 (MZUF 9061).

Previous records

Addu Atoll, Maldives Islands (Borradaile 1901).

Distribution

Pantropical.

Genus *Pseudodiploexochus* Lewis, 1998

Remarks

The genus *Pseudodiploexochus* was erected by Arcangeli (1934) to accommodate three species (*Diploexochus tabularis*, *D. ecaudatus*, and *D. albanensis*) described by Barnard (1932) in the genus *Diploexochus* Brandt, 1833. As Arcangeli did not choose any type species

for *Pseudodiploexochus*, this name was unavailable according to Art. 13.3 of the ICZN (1999). In order to revalidate that name, *D. tabularis* Barnard, 1932 was chosen as the type species of the genus *Pseudodiploexochus* by Taiti et al. (1998). In the same year, Lewis (1998) had also revalidated *Pseudodiploexochus* by choosing *D. tabularis* as the type species. As the paper by Lewis was published on 27 October while that by Taiti et al. in November 1998, according to the law of priority the authorship of *Pseudodiploexochus* is Lewis, 1998.

At present, the genus *Pseudodiploexochus* includes 28 species (including the species described here) with a wide distribution from Brazil to Australia. Many species are morphologically very similar to each other and the best characters to distinguish species are the development, number, and disposition of dorsal tubercles.

***Pseudodiploexochus indicus* n. sp.**

(Figure 8)

Material examined

Vaavu Atoll, ♂ holotype, 18 ♂♂, 21 ♀♀ paratypes, Hulhidhoo, 29.XI.1994 (MZUF 9441); 9 ♂♂, 8 ♀♀ paratypes, same locality, 29.XI.1993 (MZUF 9442); 8 ♂♂, 12 ♀♀ paratypes, Vashugiri, 28.XI.1993 (MZUF 9443); 5 ♂♂, 1 ♀ paratypes, Kudhiboli, 28.XI.1993 (MZUF 9444).

Description

Maximum dimensions: ♂, 2.0 mm × 0.8 mm; ♀, 2.5 mm × 1.0 mm. Pale color. Animals able to roll up into a perfect ball (Figure 8A). Dorsal cuticle with verruca-like protuberances among which are semicircular scale-setae (Figure 8B). Dorsal surface of pereon with inconspicuous tubercles, more pronounced on posterior pereonites, arranged as in Figure 8C. Cephalon (Figure 7D,E) with frontal lamina straight, not bent over vertex, slightly depressed in the middle; frontal margin regularly convex; eye reduced, consisting of three small pigmented dots. Pereonite 1 (Figure 8F) with lateral margin not grooved, posterior margin straight; schisma shallow, with inner lobe broadly rounded and distinctly protruding backwards compared with outer lobe. Pereonite 2 (Figure 8F) with triangular epimera and rounded ventral lobe clearly visible in lateral view. Pereonites 3 and 4 with triangular epimera and 5–7 with quadrangular epimera. Telson (Figure 8G) with slightly concave sides, distal part wide with straight margin. Antenna with distal article of flagellum more than three times longer than proximal article. Uropod (Figure 8H) with protopodite about 3/5 as long as wide, distal margin straight in the part visible in dorsal view and slightly concave in the part covered by telson; exopodite absent as in all the species of the genus. No visible respiratory structures on pleopods.

Male. Pereopods with no sexual modifications. Pleopod 1 (Figure 8I) with exopodite very small, ovoid; endopodite with triangular distal part bent outwards. Pleopod 2 (Figure 8J) endopodite more than twice as long as exopodite; exopodite triangular with concave outer margin bearing three setae.

Etymology

Latin *indicus* = Indian. The name refers to the Indian Ocean where the Maldives are located.

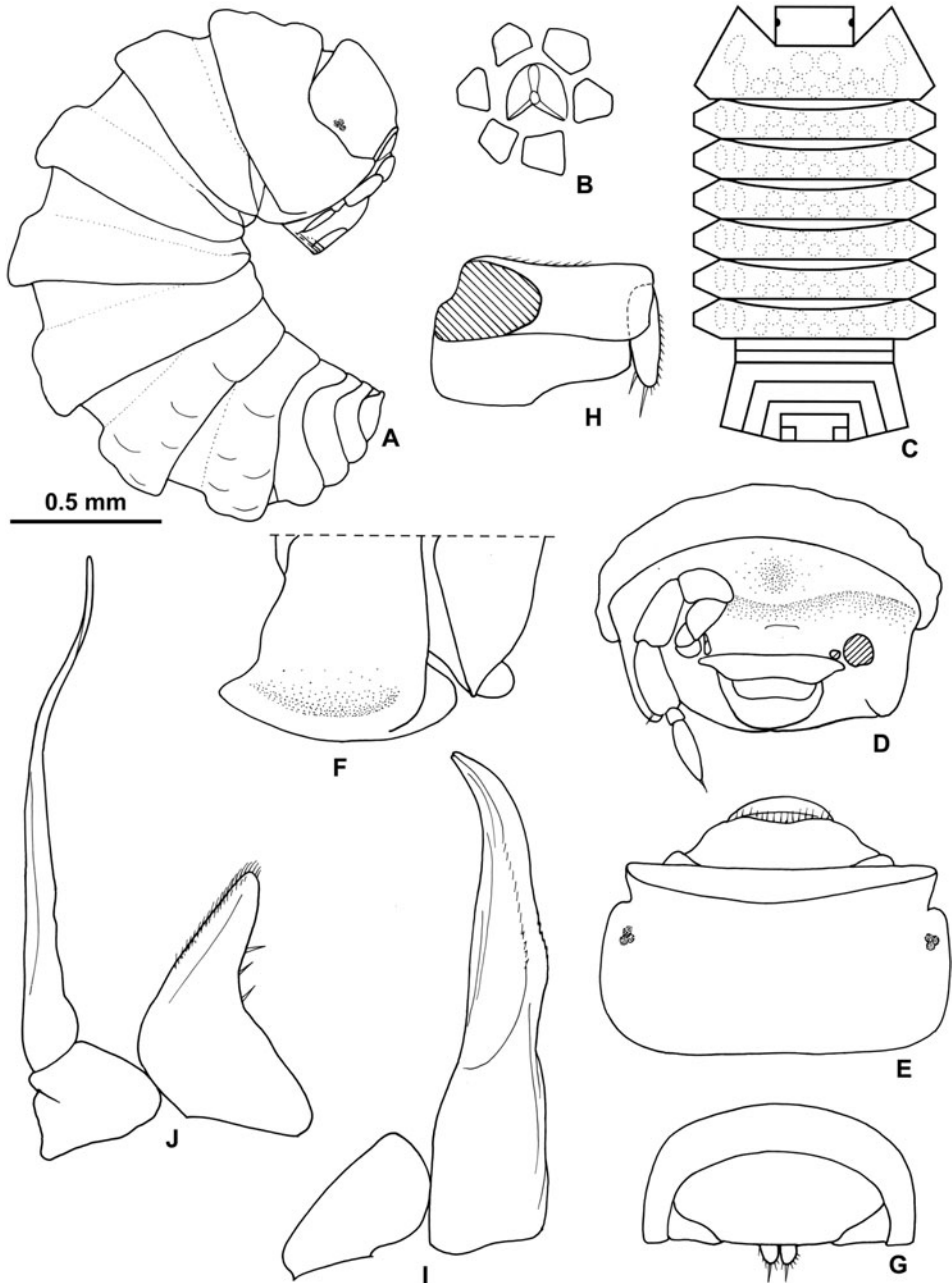


Figure 8. *Pseudodiploexochus indicus* n. sp. ♀ paratype from Hulhidhoo: (A) adult specimen, lateral; (B) dorsal scale-sets; (C) disposition of dorsal tubercles; (D) cephalon and right antenna, frontal; (E) cephalon, dorsal; (F) left side of pereonites 1 and 2, dorsal; (G) pleonite 5, telson and uropods, dorsal; (H) left uropod. ♂ paratype from Hulhidhoo: (I) pleopod 1; (J) pleopod 2.

Remarks

Pseudodiploexochus indicus is morphologically similar to *P. mascarenicus* Taiti & Ferrara, 1983 from Mauritius and *P. tabularis* (Barnard, 1932) from Cape Province, South

Africa, and southern Brazil (introduced). It is readily distinguishable from *P. mascarenicus* by the reduced eye (eye with 4–5 ommatidia in *P. mascarenicus*), dorsal ornamentation with low but still visible tubercles, inner lobe of schisma rounded instead of triangular, and presence of the exopodite in the male pleopod 1 (absent in *P. mascarenicus*). It differs from *P. tabularis* (see redescription in Taiti and Ferrara 1979) in the number and disposition of the dorsal tubercles, inner lobe of the schisma on the pereonite 1 and ventral tooth of pereonite 2 more protruding backwards, and telson with wider distal part.

Discussion

Twenty-seven species of terrestrial isopods have been collected on the Maldive Islands: *Ligia dentipes*, *Tylos albidus*, *Styloniscus maldivensis* **n. sp.**, *Olibrinus antennatus*, *Armadilloniscus quadricornis*, *A. mirabilis*, *A. biltoni*, *Buchnerillo oceanicus*, *Alloniscus pigmentatus*, *Metastemoniscus osellai*, *Littorophiloscia amphindica*, *L. tropicalis*, *L. pallida*, *Burmoniscus acutitelson*, *B. javanensis*, *B. bartolozzii*, *B. meeusei*, *Anchiphiloscia pilosa*, *Platyarthrus acropyga*, *Nagurus nanus*, *N. kensleyi*, *Porcellionides pruinosus*, *Agnara taprobanica*, *Eubelinum incertum* **n. gen., n. sp.**, *Cubaris murina*, and *Pseudodiploexocus indicus* **n. sp.**

At least 13 species are littoral, halophilic, widely distributed on the coasts of the Indian Ocean or of the Indo-Pacific area (*L. dentipes*, *T. albidus*, *O. antennatus*, *A. quadricornis*, *A. mirabilis*, *A. biltoni*, *B. oceanicus*, *A. pigmentatus*, *A. nicobaricus*, *M. osellai*, *L. amphindica*, *L. tropicalis*, and *L. pallida*), six species have a wide distribution in the tropics (*B. javanensis*, *B. meeusei*, *A. pilosa*, *N. nanus*, and *C. murina*) or are cosmopolitan (*P. pruinosus*), two species are in common with Sri Lanka (*B. bartolozzii* and *A. taprobanica*), one species (*P. acropyga*) with India, and two with the granitic Seychelles (*B. acutitelson*) and Aldabra (*N. kensleyi*). The three new species (*S. maldivensis*, *E. incertum*, and *P. indicus*) are apparently endemic to the archipelago but most probably they will be found also in some of the other lands encompassing the Indian Ocean as soon as more accurate investigations are carried out. However, *S. maldivensis* and *P. indicus* belong to genera widespread in the southern hemisphere, while *E. incertum* shows affinities with other genera of Eubelidae present in East Africa and the Arabian Peninsula. All species have certainly colonized the archipelago by dispersal and/or introduction with human activities, given the oceanic origin of the archipelago.

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