A new species of \textit{Novamundoniscus} Schultz, 1995 (Isopoda, Oniscidea, Dubioniscidae) from the state of Tocantins, Brazil

Ivanklin Soares Campos-Filho$^{1,3}$, Giovanna Monticelli Cardoso$^2$ & José Otávio Aguiar$^{1,4}$

$^1$ Universidade Federal de Campina Grande (UFCG), Programa de Pós-Graduação em Recursos Naturais (PPGRN). Campina Grande, PB, Brasil.
$^2$ Universidade Federal do Rio Grande do Sul (UFRGS), Instituto de Biociências (IBIO), Departamento de Zoologia, Laboratório de Carcinologia. Porto Alegre, RS, Brasil. ORCID: 0000-0003-2682-1643. E-mail: jojomonticelli@hotmail.com
$^3$ ORCID: 0000-0001-6139-8241. E-mail: ivanklin.filho@gmail.com
$^4$ ORCID: 0000-0003-0489-3670. E-mail: otavio.j.aguiar@gmail.com

Abstract. The genus \textit{Novamundoniscus} includes eight species with distribution in Brazil and Venezuela. The new species \textit{Novamundoniscus adhara} Campos-Filho & Cardoso sp. nov. from the state of Tocantins, northern Brazil, is described, which represents the first record to the family for the state of Tocantins.

Key-Words. Terrestrial isopods; Northern Brazil; Neotropical region.

\textbf{INTRODUCTION}

The family Dubioniscidae includes 18 species in three genera \textit{Calycuoniscus} Collinge, 1915, \textit{Dubioniscus} Vandel, 1963, and \textit{Novamundoniscus} Schultz, 1995 (Schmalfuss, 2003; Campos-Filho et al., 2014; Cardoso et al., 2016). The genus \textit{Novamundoniscus} was erected by Schultz (1995) to include the South American species previously allocated in the genus \textit{Phalloniscus} Budde-Lund, 1908, family Oniscidae. To date, the genus includes eight species from South America, \textit{i.e.}, \textit{Novamundoniscus altamirensis} Campos-Filho, Araujo & Taiti, 2014 from the state of Pará, \textit{N. dissimilis} (Lemos de Castro, 1960) and \textit{N. macrophthalmus} (Lemos de Castro, 1960) from the state of Rio de Janeiro, \textit{N. gracilis} Lopes & Araujo, 2003 from the state of Rio Grande do Sul, \textit{N. singularis} (Lemos de Castro, 1967) from the state of Amazonia, \textit{N. vandeli} (Lemos de Castro, 1960) from the state of Mina Gerais, Brazil, \textit{N. marcuizzi} (Vandel, 1952) from Caracas, Venezuela, and \textit{N. persimilis} (Vandel, 1952) from the state of Pará, Brazil and Tunapuncito, Venezuela (Schmalfuss, 2003; Boyko et al., 2008; Campos-Filho et al., 2014).

A new species of \textit{Novamundoniscus} collected in the Brazilian state of Tocantins, is described herein, which represents the first record of Dubioniscidae for the state.

\textbf{MATERIAL AND METHODS}

The material was preserved in 75\% ethanol and descriptions were based on morphological characters. The species were illustrated with the aid of a camera lucida mounted on Olympus CH-2 microscopes. The habitus illustrations were obtained with the aid of a camera Sony DSC-W800 mounted on Biofocus SQF-L-Bi microscope. The final illustrations were prepared using the software GIMP with the method proposed by Montesanto (2015, 2016). The material used in this study is deposited in the Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil (MZUSP).

\textbf{RESULTS}

\textbf{Family Dubioniscidae} Schultz, 1995

\textbf{Genus Novamundoniscus} Schultz, 1995

\textbf{Type species:} \textit{Phalloniscus vandeli} Lemos de Castro, 1960, by original designation.

\textbf{Diagnosis:} see Schultz (1995).

\textbf{Novamundoniscus adhara}
Campos-Filho & Cardoso sp. nov.
Figures 1-3

Type material: Holotype $\sigma$, Brazil, state of Tocantins, Araçulândia, at the road to Wanderlândia, 8 November 2015, leg. V. Sandoval

http://zoobank.org/54BD3DE5-1DB2-4B0B-B6AA-EE52A5049794

\textbf{Type material:} Holotype $\sigma$, Brazil, state of Tocantins, Araçulândia, at the road to Wanderlândia, 8 November 2015, leg. V. Sandoval

http://zoobank.org/CE8148C9-E16E-4954-962C-90CD5F813194
Paratypes: 1♂, 2♀♀, same data as holotype (MZUSP 36769).

**Description:** Maximum body length, male 5 mm, female 4.5 mm.

Brown color. Cephalon with irregular unpigmented spots. Antenna strongly pigmented, fifth article of peduncle with distal portion unpigmented. Pereonites 1-7 with longitudinal unpigmented rows on paramedian region. Epimera 1-7, pleon and telson strongly pigmented.

Body outline as in Fig. 1A; pereonites 1 and 2 slightly directed frontwards, pereonites 4-7 gradually more arched and directed. Dorsal surface densely covered with fan-shaped scale setae (Fig. 1B). Cephalon (Figs. 1A, C) with well-developed lateral lobes, suprantennal line bent downwards in middle, frontal line absent. Pleon outline

---

**Figure 1.** Novamundoniscus adhara Campos-Filho & Cardoso sp. nov., (female paratype). (A) habitus; (B) dorsal scale-seta; (C) cephalon, frontal view; (D) pleonites 4 and 5, and telson; (E) antennula; (F) antenna.
Figure 2. *Novamundoniscus adhara* Campos-Filho & Cardoso sp. nov., (female paratype). (A) right mandible; (B) left mandible; (C) maxillula outer endite; (D) maxilla; (E) maxilliped.
Male: Pereopods 1-4 meri and carpi with dense setae on sternal margins (Fig. 3B); pereopod 7 (Fig. 3C) without sexual dimorphism. Pleopod 1 (Fig. 3D) exopod sub-triangular, inner margin rounded, outer margin almost straight bearing five setae; endopod twice as long as exopod, distal portion slightly directed outwards. Pleopod 2 (Fig. 3E) exopod triangular, outer margin concave bearing many setae; endopod longer than exopod. Pleopod 3 exopod (Fig. 3F) triangular, outer margin sinuous bearing many setae. Pleopod 4 exopod (Fig. 3G) rhomboid outer

Figure 3. Novamundoniscus adhara Campos-Filho & Cardoso sp. nov., (female paratype): (A) uropod; (male paratype) (B) pereopod 1; (C) pereopod 7; (D) pleopod 1; (E) pleopod 2; (F) pleopod 3 exopod; (G) pleopod 4 exopod; (H) pleopod 5 exopod.
margin slightly sinuous bearing many setae. Pleopod 5 exopod (Fig. 3H) rhomboid, outer margin almost straight bearing many setae.

**Etymology:** The new species name, Adhara, is used as name in apposition and refers to a star, located at the **Canis Majoris** constellation from Southern Celestial Hemisphere. In the Brazilian National flag the Adhara star represents the state of Tocantins, where the specimens were collected.

**DISCUSSION**

As mentioned previous, the genus **Novamundoniscus** comprises seven species from Brazil. The genus mainly differs from **Dubioniscus** in having the antennal flagellum with articles subequal in length (vs. third article reduced in **Dubioniscus**), and cephalon without frontal V-shaped depression (vs. frontal V-shaped depression present in **Dubioniscus**) (see also Cardoso et al., 2016); it differs from **Calycuoniscus** in having the distal portion of telson triangular (vs. distal portion of telson rounded in **Calycuoniscus**) (see also Lemos de Castro, 1968; Schmidt, 2003). Based on mentioned characters, the species described in this work is allocated in the genus **Novamundoniscus**.

**Novamundoniscus adhara** Campos-Filho & Cardoso sp. nov. easily differs from the congeneric species in the shape of male pleopods 1 and 2.

**ACKNOWLEDGEMENTS**

We are grateful to Dr. Marcos Tavares and Maria José from MZUSP for the assistance in material deposit; to Dr. Vivian Eliana Sandoval Gómez from Universidade Federal de Tocantins for the donation of the material; to CAPES (Coordenação de Aperfeiçoamento de Pessoal de Ensino Superior) for the PNPD scholarship to ISC-F (CAPES/PNPD/UFCG/CTRNP/PPGRN/201713705-5).

**REFERENCES**

Boyko, C.B.; Bruce, N.L.; Hadfield, K.A.; Merrin, K.L.; Ota, Y.; Poore, G.C.B.; Taiti, S.; Schotte, M. & Wilson, G.D.F. 2008. World marine, freshwater and terrestrial isopod crustaceans database. **Novamundoniscus** Schultz, 1995. Accessed through: World Register of Marine. Available at: [http://www.marinespecies.org/aphia.php?p=taxdetails&id=249046](http://www.marinespecies.org/aphia.php?p=taxdetails&id=249046).

Budde-Lund, G. 1908. Isopoda von Madagaskar und Ostafrika mit Diagnosen verwandter Arten. In: Voeltzko, A. (Ed.). **Ostafrika in den Jahren 1903-1905: mit Mitteln der Hermann und Else geb. Heckmann Wentzel-Stiftung; Wissenschaftliche Ergebnisse.** Stuttgart, E. Schweizerbartsche Verlagsbuchhandlung, v. 2, p. 265-308, pls. 12-18.

Campos-Filho, I.S.; Araujo, P.B.; Bichuette, M.E.; Trajano, E. & Taiti, S. 2014. Terrestrial isopods (Crustacea: Isopoda: Oniscidea) from Brazilian caves. **Zoological Journal of the Linnean Society**, 172: 360-425.

Cardoso, G.M.; Campos-Filho, I.S. & Araujo, P.B. 2016. The genus **Dubioniscus** Vandel, 1963 (Oniscidea, Dubioniscidae) with descriptions of two new species from Brazil, **Tropical Zoology**, 29(3): 111-133.

Collinge, W.E. 1915. Description of a new genus and species of terrestrial Isopoda from British Guiana. **Journal of the Linnean Society, Zoology**, 32: 509-511, pl. 50.

Lemos de Castro, A. 1960. Sôbre as espécies americanas de **Phalloniscus** Budde-Lund (Isopoda, Oniscidea), com descrição de 4 espécies novas. In: **Congresso Sudamericano de Zoologia**, 1º. **Actas y Trabajos. La Plata, Universidad Nacional de La Plata. v. 2**, p. 203-211.

Lemos de Castro, A. 1967. Isópodos terrestres da Amazônia Brasileira (Isopoda, Oniscoidea). **Atas do Simpósio sobre a Biota Amazônica, Rio de Janeiro, CNPq. v. 5**, p. 311-336.

Lemos de Castro, A. 1968. Descrição complementar de “**Calycuoniscus goeldii**” (Isopoda terrestria, Oniscidae, Bathytropinae). **Revista Brasileira de Biologia**, 28: 407-412.

Lopes, E.R.C. & Araujo, P.B. 2003. New species of **Novamundoniscus** Schultz (Isopoda, Oniscidea, Dubioniscidae) para o Rio Grande do Sul, Brasil. **Revista Brasileira de Zoologia**, 20(4): 611-614.

Montesanto, G. 2015. A fast GNU method to draw accurate scientific illustrations for taxonomy. **Zooyles**, 515: 191-206.

Montesanto, G. 2016. Drawing setae: a GNU way for digital scientific illustrations. **Nauplius**, 24: e2016017.

Schmalfuss, H. 2003. World catalog of terrestrial isopods (Isopoda: Oniscidea). **Zool. Beiträge zur Naturkunde**, 654: 1-341.

Schmidt, C. 2003. Contribution to the phylogenetic system of the Crinocheta (Crustacea, Isopoda). Part 2 (Oniscoidea to Armadillididae). **Mitteilungen aus dem Museum für Naturkunde in Berlin, Zoosystematics and Evolution**, 79(1): 3-179.

Schultz, G.A. 1995. Terrestrial isopod crustaceans (Oniscidea) from Paraguay with definition of a new family. **Revue Suisse de Zoologie**, 102(2): 387-424.

Vandel, A. 1952. **Étude des isopodes terrestres recueillis au Vénézuela par le Dr. G. Marcuzzi. Memorie del Museo Civico di Storia Naturale di Verona**, 3: 59-203.

Vandel, A. 1963. Isopodes terrestres recueillis en Amerique du Sud par Claude Delamare Deboutteville. In: **Deboutteville, C.D. (Ed.). Biologie de l’Amerique australe.** Paris, Editions du Centre National de la Recherche Scientifique. p. 63-100.