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A new bathyal mysid of the family Petalophthalmidae (Crustacea: Mysida) from the Bismarck Sea (Western Tropical Pacific Ocean)

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Abstract

A new species of the genus *Petalophthalmus* (Crustacea: Mysida: Petalophthalmidae) is described, based on one specimen collected from the Bismarck Sea (Papua New Guinea, Western Pacific Ocean). This species can be distinguished from the other species of the genus *Petalophthalmus* by the globular cornea and the armature of the telson. This new species lives between 800 and 1065 m depth. A discussion on the geographic and bathymetric distribution and an identification key to world species of *Petalophthalmus* are provided.

Key words: Mysida, Petalophthalmidae, taxonomy, new species, deep sea, W Pacific Ocean

Introduction

Papua New Guinea is an area where both biodiversity and biogeography of deep-sea animals remain unknown. To fill in this gap, several oceanographic expeditions have been launched since 2010 in the Bismarck Sea and along the north coast of Papua New Guinea by the Muséum National d'Histoire Naturelle (MNHN), the Institut de Recherche pour le Développement under the umbrella of the research program 'Tropical Deep-Sea Benthos' (see Richer de Forges *et al,* 2013). First data available suggest that deep New Guinean fauna is at the confluence of significantly different biogeographic regions, and is more closely related to the southern than the northern Pacific fauna (Pante *et al.* 2012). Mysids are not an exception of this lack of knowledge. In recent years the studies of mysid occurrence and distribution throughout the Southeast Asian and Australian coasts has increased (Sawamoto and Fukuoka 2005, Yerman and Lowry 2007), but biosystematic investigations over the greater part of the Pacific Ocean (Papua New Guinea zone included) are still required.

Moreover, recent studies on deep-sea assemblages from previously unexplored regions of the world are continuing to discovere new species of mysid , some belonging to the family Petalophthalmidae Czerniavsky, 1882 (Casanova and De Jong 2005; San Vicente and Sorbe 2008; Fukuoka 2009; San Vicente 2009, 2010a; San Vicente *et al.* 2014).

Mysids of the family Petalophthalmidae constitute a diverse benthic group containing six genera with 39 known species (Mees & Meland 2012; San Vicente *et al.* 2014). The family is primarily a bathyal-abyssal group, nine of the 39 known species occur between 3000 to 5000 m, 15 species occur on continental slopes between 1000 and 3000 m, 12 species occur down to the continental shelf break between 200 to 1000 m depth and only three species have been collected on the continental shelves, or shallower than 200 m of depth. Almost all species are restricted to the suprabenthic habitat, living in close association with the water layer adjacent to the sea bottom.

Established by Czerniavsky (1882), the genus *Petalophthalmus* presently contains six species: *P. armiger* Willemoës-Suhm, 1875, *P. oculatus* Illig, 1906, *P. caribbeanus* Tattersall, 1968, *P. macrops* Tchindonova and Vereschchaka, 1991, *P. liui* Wang, 1998 and *P. papilloculatus* San Vicente, Frutos and Cartes, 2014.

The *Petalophthalmus* species are generally deep water mysids inhabiting the epi-, meso- and bathypelagic zone. They are rarely recorded and always represented by a low number of specimens. The genus is widely distributed throughout the world oceans (Müller 1993, Mees and Meland 2012).

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References

Alcock, A. & Anderson, A.R.S. (1894) An account of a recent collection of deep sea Crustacea from the Bay of Bengal and Laccadive Sea. *Journal of the Asiatic Society of Bengal,* 63, 141–185.

Bacescu, M. & Iliffe, T.M. (1986) Contribution to the knowledge of Mysidacea from western Pacific: *Aberomysis muranoi* n.gen., n.sp. and *Palaumysis simonae* n.gen., n.sp. from marine caves on Palau, Micronesia. *Travaux du Muséum d´Histoire Naturelle "Grigore Antipa"*, 28, 25–35.

Bartsch, P. (1933) Station records of the first Johnson-Smithsonian Deep-Sea Expedition. *Smithsonian Miscellaneous Collections*, 91 (1), 1–31.

Birstein, J.A. & Tchindonova, J.G. (1958) Glubocovodniie Mysidii severo zapadnoi ciasti Tihogo Okeana. *Trudy Instituta Okeanologii*, 27, 258–355.

Bravo, M.F. & Murano, M. (1997) *Pseudopetalophthalmus japonicus*, new genus, new species (Mysidacea: Petalophthalmidae). *Journal of Crustacean Biology,* 17 (4), 725–732. http://dx.doi.org/10.2307/1549375

Boas, J.E.V. (1883) Studien über die Verwandtschaftsbeziehungen der Malakostraken. *Morphologisches Jahrbuch*, 8 (4), 485–579.

Casanova, I.P. (1993) Crustacea Mysidacea: Les Mysidacés Lophogastrida et Mysida (Petalophthalmidae) de la région néo-calédonienne. *In*: Crosnier, A. (Ed.), Résultats des Campagnes MUSORSTOM. Vol. 10. *Mémoires du Muséum National d´Histoire Naturelle,* 156, pp. 33–53.

Casanova, J.P. & De Jong, L. (2005) A new North-East Atlantic species of *Bacescomysis* (Mysidacea, Crustacea) with original moth-like antennules. *Journal of Natural History,* 39 (21), 1839–1849. http://dx.doi.org/10.1080/00222930400023784

Coll, M., Piroddi, C., Steenbeek, J., Kaschner, K., Lasram, F.B.R., Aguzzi, J., Ballesteros, E., Bianchi, C.N., Corbera, J., Dailianis, T., Danovaro, R., Estrada, M., Froglia, C., Galil, B.S., Gasol, J.M., Gertwage, R., Gil, J., Guilhaumon, F., Kesner-Reyes, K., Kitsos, M.-S., Koukouras, A., Lampadariou, N., Laxamana, E., de la Cuadra, C.M.L.-F., Lotze, H.K., Martin, D., Mouillot, D., Oro, D., Raicevich, S., Rius-Barile, J., Saiz-Salinas, J.I., Vicente, C.S., Somot, S., Templado, J., Turon, X., Vafidis, D., Villanueva, R. & Voultsiadou, E. (2010) The biodiversity of the Mediterranean Sea: estimates, patterns, and threats. *Plos One,* 5 (8), e11842. http://dx.doi.org/10.1371/journal.pone.0011842

Czerniavsky, V. (1882) Monographia Mysidarum inprimis Imperii Rossici (marin. lacustr. et fluviatilum). Fasc. 1. Trudy Sankt.-Peterburgskago Obschestwo Estestwoispytatelei, 12 (2), 1–170.

Escobar Briones, E. & Soto, L.A. (1991) Biogeografía de los Misidáceos (Crustacea: Peracarida) del Golfo de México. *Caribbean Journal of Science*, 27 (1–2), 80–89.

Faxon, W. (1893) Reports on the dredging operations off the west coast of Central America to the Galapagos, to the west coast of Mexico, and in the Gulf of California, in charge of Alexander Agassiz, carried on by the U.S. Fish Commission Steamer "Albatross" during 1891, Lieut. Commander Z.L. Tanner, U.S.N., commanding. VI. Preliminary descriptions of new species of Crustacea. *Bulletin of the Museum of Comparative Zoology at Harvard College,* 24 (7), 149–220.

Faxon, W. (1895) Reports on an exploration off the west coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U.S. Fish Commission steamer "Albatross" during 1891, Lieut.-Commander Z.L. Tanner, U.S.N., commanding. XV. The stalk-eyed Crustacea. *Memoires of the Museum of Comparative Zoology at Harvard College*, 18, 1–292.

Fukuoka, K. (2009) Deep-sea mysidaceans (Crustacea: Lophogastrida and Mysida) from the north-western North Pacific off Japan, with descriptions of six new species. *National Museum of Nature and Science Monographs,* 39, 405–446.

Gan, S.Y., Azman, B.A.R., Yoshida, T., Majid, A.M., Tloda, T., Takahashi, K. & Othman, B.H.R. (2010) Comparison of day and night mysid assemblages in a seagrass bed by using emergence traps, with key to species occurring at Palau Tinggi, Malaysia. *Coastal Marine Science,* 34 (1), 74–81.

Garm, A. (2004) Revising the definition of the crustacean seta and setal classification systems based on examinations of the mouthpart setae of seven species of decapods. *Zoological Journal of the Linnean Society*, 142, 233–252. http://dx.doi.org/10.1111/j.1096-3642.2004.00132.x

Hanamura, Y. (1998) Gastrosaccini mysids from Australia, with a description of a new species of *Haplostylus* and a key to species of the genus (Crustacea: Mysidacea). *Records of the Western Australian Museum,* 19, 153–168.

Hanamura, Y. & DeGrave, S. (2004) Mysid crustaceans (Mysidacea) from Palau, northwestern Pacific. *Biogeography*, 6, 63–68.

Hansen, H.J. (1910) The Schizopoda of the Siboga Expedition. *Siboga Reports*, 37, 1–123.

Hansen, H.J. (1927) *Les Schizopodes*. *In*: Expédition scientifiques du "Travailleur" et du "Talisman" 1880-3. G. Mason, Paris, pp. 9–27.

Holt, E.W.L. & Tattersall, W.M. (1905) Report on the schizopods collected by Mr. George Murray, F.R.S., during the cruise of the "Oceana" in 1898. *The Annals and Magazine of Natural History,* Series 7, 16 (91), 1–10.

Holt, E.W.L. & Tattersall, W.M. (1906) Preliminary notice of the Schizopoda collected by H.M.S. "Discovery" in the Antarctic region. *The Annals and Magazine of Natural History,* Series 7, 17 (97), 1–11.

Illig, G. (1906) Bericht über die neuen Schizopodengattungen und -arten der deutschen Tiefsee-Expedition 1898–1899.

Zoologischer Anzeiger, 30, 194–211.
Illig, G. (1930) *Die Schizopoden der deutschen Tiefsee-Expedition*. In Chun, C., Wissenschaftliche Ergebnisse Deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898-1899. Jena, Gustav Fischer, 22, 397–625.
International Commission on Zoological Nomenclature (1999) *International Code of Zoological Nomenclature. 4th Edition*. International Trust for Zoological Nomenclature, London, 306 pp.
Kathman, R.D., Austin, W.C., Saltman, J.C. & Fulton, J.D. (1986) Identification manual to the Mysidacea and Euphausiacea of the northeast Pacific. *Canadian Special Publication of Fisheries and Aquatic Sciences*, 93, 1–411.
Khmeleva, N.N. & Gouloubev, A.P. (1986) *La production chez les crustacés: rôle dans les écosystèmes et utilisations.* Publications Ifremer, Brest, 1–198.
Ledoyer, M. (1995) Mysidacés (Crustacea) de Kerguelen, Crozet et Bouvet (Océan Austral) récoltés par la Japonaise, le Marion-Dufresne (1972–82) et dans des contenus stomacaux d´oiseaux. *Journal of Natural History*, 29, 601–618. http://dx.doi.org/10.1080/00222939500770211
Margalef, R. (1980) *Ecologia.* Ed. Omega, Barcelona, 951 pp.
Mauchline, J. (1980) The biology of mysids and euphausiids. *Advances in Marine Biology*, 18, 1–680.
Mauchline, J. & Murano, M. (1977) World list of the Mysidacea, Crustacea. *Journal of the Tokyo University of Fisheries*, 64 (1), 39–88.
Mees, J. & Meland, K. (Eds.) (2012) *World List of Lophogastrida, Stygiomysida and Mysida*. Available from: http://www.marinespecies.org/mysidacea (accessed 1 June 2014)
Müller, H.G. (1993) *World Catalogue and Bibliography of the Recent Mysidacea*. Wissenschaftler Verlag, Tropical Products Trading Center, Wetzlar, 1–491. [Germany]
Murano, M. (1970) Systematic and ecological studies on Mysidacea collected by the bottom-net. *Journal of the Oceanographical Society of Japan*, 26 (3), 137–150. http://dx.doi.org/10.1007/BF02753888
Murano, M. (1974) Mysidacea from the central and western Pacific I. Genus *Pseudomma* (Tribe Erythropini). *Publications of the Seto Marine Biological Laboratory*, 21 (5/6), 287–334.
Murano, M. (1975) Mysidacea from the central and western Pacific II. Genera *Hyperamblyops*, *Teraterythrops* and *Synerythrops* (tribe Erythropini). *Publications of the Seto Marine Biological Laboratory*, 22 (1/4), 81–103.
Murano, M. (1976) Mysidacea from the central and western Pacific III. Genera *Eoerythrops*, *Holmesiella*, *Pteromysis*, *Longithorax* and *Katerythrops* (Tribe Erythropini). *Publications of the Seto Marine Biological Laboratory*, 23 (1/2), 19–50.
Murano, M. (1977) Mysidacea from the central and western Pacific IV. Genera *Euchaetomera*, *Euchaetomeropsis*, *Arachnomysis*, *Echinomysides*, *Meterythrops* and *Nipponerythrops* (tribe Erythropini). *Publications of the Seto Marine Biological Laboratory*, 24 (1/3), 141–192.
Murano, M. (1981) Mysidacea from the central and western Pacific V. Genera *Heteroerythrops*, *Meierythrops*, *Pleurerythrops*, *Gibberythrops*, *Illigiella*, *Dactylamblyops*, *Pseudamblyops*, *Paramblyops*, *Dactylerythrops* and *Nakazawaia* (tribe Erythropini). *Publications of the Seto Marine Biological Laboratory*, 26 (4/6), 261–302.
Murano, M. (1983) Mysidacea fauna from Enewetak Lagoon, Micronesia. *Bulletin of Plankton Society of Japan,* 30 (1), 81–90.
Murano, M. & Bravo, M.R. (1998) *Parapetalophthalmus suluensis*, a new genus and species (Crustacea: Mysidacea: Petalophthalmidae) from the Sulu Sea. *Proceedings of the Biological Society of Washington,* 111 (4), 849–856.
Murano, M. & Fukuoka, K. (2008) A systematic study of the genus Siriella (Crustacea: Mysida) from the Pacific and the Indian Oceans, with descriptions of fifteen new species. *National Museum of Nature and Science Monograph,* 36, 1–173.
Ortmann, A.E. (1905) Schizopods of the Hawaiian Islands collected by the steamer Albatross in 1902. *Bulletin of the United States Fish Commission*, 1903 (Part III), 961–973.
Panampunnayil, S.U. (1982) Description of a new species of *Petalophthalmus* (Mysidacea) with a revised definition of the genus. *Journal of Plankton Research*, 4 (3), 643–650. http://dx.doi.org/10.1093/plankt/4.3.643
Pillai, N.K. (1965) A review of the work on the shallow water Mysidacea of the Indian waters. *In*: *Proceedings of the Symposium on Crustacea, held at Ernakulam from January 12 to 15, 1965. Symposium Series 2.* Marine Biological Association of India, Mandapam Camp, pp. 1681–1728.
Pante, E., Corbari, L., Thubaut, J., Chan, T.-Y., Mana, R., Boisselier, M.-C., Bouchet, P. & Samadi, S. (2012) Exploration of the deep-sea fauna of Papua New Guinea. *Oceanography*, 25 (3), 214–225. http://dx.doi.org/10.5670/oceanog.2012.65
Pillai, N.K. (1968) Redescription of *Petalophthalmus oculatus* (Crustacea: Mysidacea) based on an adult female collected from near the type locality. *Journal of Zoology*, 155, 283–291. http://dx.doi.org/10.1111/j.1469-7998.1968.tb03053.x
Pillai, N.K. (1973) Mysidacea of the Indian Ocean. *In*: *Handbook to the International Zooplankton Collections. Curated and Processed at the Indian Ocean Biological Centre, National Institute of Oceanography, Council of Scientific and Industrial Research. Vol. 4.* Indian Ocean Biological Centre, Cochin, pp. 1–125.
Richer de Forges, B., Chan, T.-Y., Corbari, L., Lemaitre, E., Macpherson, E., Ahyong, S.T. & Ng, P.K.L. (2013) The MUSORSTOM-TDSB deep sea Benthos exploration programme (1976–2012): An overview of crustacean discoveries and new perspectives on deep-sea zoology and biogeography. *In*: Ahyong, A., Chan, T.-Y., Corbari, L. & Ng, P. (Eds.),

Tropical Deep-Sea Benthos, 27, pp. 13–66.
San Vicente, C. (2009) *Hansenomysis sorbei* n. sp., a new suprabenthic mysid (Crustacea: Mysida: Petalophthalmidae) from the Bellingshausen Sea (Southern Ocean). *Zootaxa*, 2240, 31–40.
San Vicente, C. (2010a) Species diversity of Antarctic mysids (Crustacea: Lophogastrida and Mysida). *In*: Mulder, T.J. (Ed.), *Antarctica: Global, Environmental and Economic Issues*. Nova Science Publishers, Inc., New York, pp. 1–80.
San Vicente, C. (2010b) Mysidaceans. *In*: Coll M, Piroddi C, Steenbeek J, Kaschner K, Ben Rais Lasram F, et al. (Eds.), *The Biodiversity of the Mediterranean Sea: Estimates, Patterns, and Threats*. PLoS ONE, 5 (8), e11842. [Supporting information 2nd file, 247–275]
San Vicente, C. & Sorbe, J.C. (2008) *Hansenomysis anaramosae* n. sp., a new suprabenthic mysid (Crustacea: Mysidacea: Petalophthalmidae) from the Bellingshausen Sea (Southern Ocean). *Organisms, Diversity and Evolution*, 8, 21e1–21e9.
San Vicente, C. & Sorbe, J.C., (2013) Comparative life-histories, population dynamics and productivity of *Schistomysis* populations (Crustacea, Mysida) in European shelf environments. *Journal of Sea Research*, 81, 13–32.
http://dx.doi.org/10.1016/j.seares.2013.03.009
San Vicente, C., Frutos, I. & Cartes, J.E. (2014) *Petalophthalmus papilloculatus* sp. nov. (Crustacea: Mysida: Petalophthalmidae), a new bathyal suprabenthic mysid from the Galicia Bank (NE Atlantic Ocean). *Zootaxa*, 3765 (1), 77–91.
http://dx.doi.org/10.11646/zootaxa.3765.1.5
Sars, G.O. (1885) Report on the Schizopoda collected by H.M.S. "Challenger" during the years 1873–1876. *Reports of the scientific Results of the Voyage of H.M.S. Challenger Zoology*, 13 (37), 1–128.
Sawamoto, S. & Fukuoka, K. (2005) Lists of mysid species and references for their identification in Southeast Asian waters. *Bulletin of Institute of Oceanic Research and Development Tokai University,* 26, 79–93.
Tattersall, O.S. (1955) Mysidacea. *Discovery Reports*, 28, 1–190.
Tattersall, O.S. (1968) A new species of *Petalophthalmus* (Mysidacea) based on specimens from off Puerto Rico, hitherto referred to *Petalophthalmus oculatus*. *Journal of Zoology,* 155, 271–282.
http://dx.doi.org/10.1111/j.1469-7998.1968.tb03052.x
Tattersall, W.M. (1925) Mysidacea and Euphausiacea of marine survey, South Africa. *Report Union of South Africa, Fisheries and Marine Biological Survey, Special Report*, V, 1–12.
Tattersall, W.M. (1937) New species of mysidacid crustaceans. *Smithsonian Miscellaneous Collections*, 91 (26), 1–18.
Tattersall, W.M. (1939) The Euphausiacea and Mysidacea of the John Murray Expedition to the Indian Ocean. *Scientist Report of John Murray Expedition*, 5, 203–246.
Tattersall, W.M. (1951) A review of the Mysidacea of the United States National Museum. *Bulletin of the United States National Museum,* 201, 1–292.
http://dx.doi.org/10.5479/si.03629236.201.1
Tattersall, W.M. & Tattersall, O.S. (1951) *The British Mysidacea.* Ray Society, London, 460 pp.
Tchindonova, Y.G. & Vereshchaka, A.L. (1991) New mysid species *Petalophthalmus macrops* sp. n. from the west part of the Indian Ocean. *Zoologicheskii Zhurnal,* 70 (1), 135–138 . [in Russian with English abstract]
Tsai, P.-C., Yeh, H.-M., Chan, B.K.K. & Chan, T.-Y. (2009) Comparison between the catch composition of the French and ORE type beam trawls on deep-sea decapod crustaceans: implications for quantitative sampling of the deep-sea decapod biodiversity. *Crustaceana*, 82 (5), 565–591.
http://dx.doi.org/10.1163/156854008X390326
Vereshchaka, A.L. (1995) Macroplankton in the near-bottom layer of continental slopes and seamounts. *Deep Sea Research I*, 42 (9), 1639–1668.
http://dx.doi.org/10.1016/0967-0637(95)00065-E
Wang, S. (1998) On new and rare species of Mysidacea (Crustacea) from the Northern South China Sea. *Studia Marina Sinica,* 40, 199–244. [in Chinese with English abstract].
Wang, S. & Liu, R. (1997) Mysidacea fauna of the East China Sea. *Studia Marina Sinica,* 38, 191–222. [in Chinese with English abstract]
Watling, L. (1989) A classification system for crustacean setae based on the homology concept. *In*: Felgenhauer B, Watling L. & Thistle A.B. (Eds.), *Functional morphology of feeding and grooming in Crustacea.* Rotterdam, A.A. Balkema, pp. 15–26.
Willemoës-Suhm, R. von (1875) On some Atlantic Crustacea from the 'Challenger' Expedition (communicated by W. Thomson). *Transactions of the Linnean Society of London. Second Series. Zoology,* 1 (1), 23–59.
Wittmann, K.J., Ariani, A.P. & Lagardère, J.P. (2014) Orders Lophogastrida Boas, 1883, Stygiomysida Tchindonova, 1981, and Mysida Boas, 1883 (also known collectively as Mysidacea). *In*: von Vaupel Klein, J.C., Charmantier-Daures, M. & Schram, F.R. (Eds.), *Treatise on Zoology - Anatomy, Taxonomy, Biology. The Crustacea. Revised and updated, as well as extended from the Traité de Zoologie. Vol. 4. Part B (54).* Koninklijke Brill NV, Leiden, pp. 189–396. [ISBN: 9789004264922]
Yerman, M. & Lowry, J.K. (2007) Australian Mysidacea. Version 1 March 2007. Available from: http://www.crustacea.net (accessed 11 June 2014)
Zimmer, C. (1914) *Die Schizopoden der Deutschen Südpolar-Expedition 1901-1903*. G. Reimer, Berlin, 67 pp. [pp. 379–445]