Zootaxa 3814 (4): 478–494
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3814.4.2
http://zoobank.org/urn:lsid:zoobank.org:pub:84CD1F7F-9E65-48F3-BE24-C8815264671A

Four new *Paramphimonhystrella* species (Nematoda: Xyalidae) from the continental slope of New Zealand

DANIEL LEDUC
National Institute of Water and Atmospheric Research, Private Bag 14-901, Wellington, New Zealand.
E-mail: Daniel.Leduc@niwa.co.nz

Abstract

Four new *Paramphimonhystrella* species are described from the continental slope of New Zealand. *P. glossalga* **n. sp.** is characterised by presence of twelve lips, large buccal cavity, males with short, heavily cuticularised spicules joined distally, and females with large postvulvar sac and hammer-shaped cuticularised piece immediately posterior to vagina. *P. barbula* **n. sp.** is characterised by narrow buccal cavity, oval-shaped amphids, conico-cylindrical tail with swollen appearance due to conspicuously enlarged caudal gland, and males with long slender spicules and small gubernaculum. *P. scutula* **n. sp.** is characterised by a lozenge-shaped buccal cavity, males with scythe-shaped spicules, females with vulva at almost two thirds of body length from anterior, and a hammer-shaped cuticularised piece immediately posterior to vagina. *P. echinocauda* **n. sp.** is characterised by buccal cavity with cylindrical anterior portion and funnel-shaped posterior portion, distal tip of slender spicules with three pointed projections, thin gubernaculum, and tail with several long setae in middle portion, two lateral setae near tail tip and one terminal seta. The presence of a hammer-shaped cuticularised piece in two species of the genus is recorded for the first time; the function of this structure is unknown. The genus diagnosis is emended and a key to all known *Paramphimonhystrella* species (seven in total) is provided. The present study provides the first record of the genus outside the type locality (Yellow Sea) and extends its depth distribution from <150 m to 1350 m.

Key words: Scanning electron microscopy, bathyal; meiofauna; identification key; canyon

Introduction

The genus *Paramphimonhystrella* Huang & Zhang, 2006 was recently described from the Yellow Sea (<150 m water depth) and until now comprised three species, *viz*., *P. elegans* Huang & Zhang, 2006, *P. minor* Huang & Zhang, 2006, and *P. sinica* Huang & Zhang, 2006. Here, I provide the first record of the genus outside the type locality and describe four new *Paramphimonhystrella* species from the continental slope of New Zealand (350–1350 m water depth): *P. glossalga* **n. sp.**, *P. barbula* **n. sp.**, *P. scutula* **n. sp.**, and *P. echinocauda* **n. sp.**

Methods

Samples were obtained from Chatham Rise and southern Hikurangi Margin on the continental slope of New Zealand, Southwest Pacific. The Chatham Rise is a submarine ridge that extends eastwards from the South Island of New Zealand, over water depths ranging from ca. 250 to 3000 m. The southern Hikurangi Margin lies along the south-eastern edge of the North Island of New Zealand and is situated north of Chatham Rise. Samples were collected on southern Hikurangi Margin during National Institute of Water and Atmospheric Research (NIWA) cruise TAN1004 (six sites, 670–1350 m water depth) in April 2010, and on Chatham Rise crest during NIWA cruise TAN0116 and TAN0705 (two sites, 350 and 424 m water depth) in October 2001 and April 2007, respectively.

Sediment samples were collected using an Ocean Instruments MC-800A multicorer (MUC; core internal diameter = 9.52 cm). Each sample consisted of one subcore of internal diameter 26 or 29 mm taken to a depth of 5

 Accepted by K. Davies: 29 Apr. 2014; published: 11 Jun. 2014

Discussion

The function of the hammer-shaped cuticularised piece in females of *P. glossalga* **n. sp.** and *P. scutula* **n. sp.** is unknown; I could not discern any musculature associated with it in any of the specimens (it may be present). This structure may be involved in egg laying or copulation, or may help control the flow of sperm to and from the postvulvar sac (although no connection with the postvulvar sac was seen). Another possibility is that it channels the flow of secretions from the vaginal glands (which lie on either side of the cuticularised piece) to the vagina. To my knowledge, such structures have not been reported in other nematodes. Cuticularisation of the uterus wall or vagina (i.e., *vagina vera*) are found in several nematode taxa (e.g., Comesomatidae, see *Hopperia ancora* in Leduc (2012), Desmodoridae, see *Pseudochromadora reathae* in Leduc & Wharton (2010), and Monhysteridae, (e.g., Fonseca & Decraemer 2008)), but in *Paramphimonhystrella,* the cuticularised piece is not part of the uterus or vagina. The cuticularised piece in *Paramphimonhystrella* is similar in shape, structure, and size to the tubular pre-cloacal supplements found in many species of the order Plectida (e.g., *Antomicron pellucidum* Cobb, 1920, see Holovachov (2012); the latter are usually associated with glands similar to the vaginal glands. Pre-cloacal supplements, however, are not found in the order Monhysterida.

The present study extends the known distribution of *Paramphimonhystrella* from the continental shelf (Yellow Sea) to the continental slope down to a depth of 1350 m. Ecological surveys of nematode communities on southern Hikurangi Margin, Chatham Rise, and Challenger Plateau (west of the North Island of New Zealand) show that *Paramphimonhystrella* is relatively common and widely distributed but, as is common of most deep-sea taxa, only occurs at low relative densities (usually <3 % of total nematode abundance) (Leduc *et al*. 2012, D. Leduc unpublished data).

Acknowledgments

Sample data were generated under the Foundation for Research, Science and Technology (FRST) programme 'Ocean Ecosystems' (C01X0027) and the New Zealand Ocean Survey 20/20 Chatham-Challenger and IPYCAML Ross Sea projects for which we thank the funding agencies, Land Information New Zealand, Ministry of Fisheries, Department of Conservation and NIWA, for permission to use the data. Funding was provided by NIWA's Coasts and Oceans Centre Research Programme 2 (2013/14 SCI) and the programmes 'Impact of resource use on vulnerable deep-sea communities' (CO1X0906), 'Coasts & Oceans OBI' (C01X0501), and 'Consequences of Earth-Ocean Change' (C01X0702). I am grateful to Katrin Berkenbusch and Norliana Rosli for processing meiofauna samples (TAN0116 and TAN1004). I also thank the participants of NIWA voyages TAN0116, TAN0705, and TAN1004, and the officers and crew of RV *Tangaroa*.

References

Decraemer, W., Karanastasi, E., Brown, D. & Backeljau, T. (2003) Review of the ultrastructure of the nematode body cuticle and its phylogenetic interpretation. *Biological Reviews,* 78, 465–510.

Fonseca, G. & Decraemer, W. (2008) State of the art of the free-living marine Monhysteridae (Nematoda). *Journal of the Marine Biological Association of the United Kingdom*, 88, 1371–1390. http://dx.doi.org/10.1017/s0025315408001719

Fonseca, G. & Bezerra, T.N. (2014) Order Monhysterida Filipjev, 1929. *In*: Schmidt-Rhaesa, A. (Ed.), *Handbook of Zoology.* De Gruyter, Hamburg, pp.435–465.

Holovachov, O. (2012) Swedish Plectida (Nematoda). Part 2. The genus *Antomicron* Cobb, 1920. *Zootaxa*, 3380, 39–54.

Huang, Y. & Zhang, Z.N. (2006) A new genus and three new species of free-living marine nematodes from the Yellow Sea, China. *Journal of Natural History,* 40, 5–16. http://dx.doi.org/10.1080/00222930600617781

Leduc, D. & Wharton, D.A. (2010) New free-living marine nematode species (Nematoda: Desmodoridae) from the coast of New Zealand. *Zootaxa*, 2611, 45–57.

Leduc, D. (2012) Deep-sea nematodes (Comesomatidae) from the Southwest Pacific Ocean: five new species and three species records. *European Journal of Taxonomy*, 24, 1–42. http://dx.doi.org/10.5852/ejt.2012.24

Leduc, D., Rowden, A.A., Bowden, D.A., Nodder, S.D., Probert, P.K., Pilditch, C.A., Duineveld, G.C.A. & Witbaard, R. (2012) Nematode beta diversity on the continental slope of New Zealand: spatial patterns and environmental drivers. *Marine Ecology Progress Series,* 454, 37–52. http://dx.doi.org/10.3354/meps09690

Somerfield, P.J. & Warwick, R.M. (1996) *Meiofauna in marine pollution monitoring programmes: a laboratory manual*. Lowestoft, Ministry of Agriculture, Fisheries, and Food, United Kingdom, 71 pp.