New host and third western Pacific Ocean records for *Nerocila trichiura* (Isopoda: Cymothoidae), a skin parasite of flyingfishes

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**Abstract.**— An ovigerous female of the cymothoid isopod *Nerocila trichiura* (Miers, 1877) was collected from the isthmus of *Cheilopogon doederleinii* (Steindachner, 1887) (Beloniformes: Exocoetidae), in Kowaura Bay, Mie Prefecture, central Japan. This represents the third record of *N. trichiura* from the western Pacific Ocean, and *C. doederleinii* is a new host of the isopod. A skin wound caused by the isopod was found at attachment site.

**Key words:** marine parasite, isopod, cymothoid, Cheilopogon doederleinii

The cymothoid isopod *Nerocila trichiura* (Miers, 1877) is a skin parasite of flyingfishes (Beloniformes: Exocoetidae) and widely occurs in the tropical and middle-latitude waters of the world oceans (Nagasawa & Isozaki, 2019; Ravichandran *et al.*, 2019). While *N. trichiura* has not been reported from the eastern Pacific Ocean, two records of the species exist from the western Pacific Ocean, where it was first reported in 1884 from the Philippines (Schioedte & Meinert, 1884) and much later recorded from Japan (Nagasawa & Isozaki, 2019). Recently, an ovigerous female of isopod was collected by Susumu Isozaki, a fisherman and amateur scientist, from *Cheilopogon doederleinii* (Steindachner, 1887), in coastal Pacific waters of central Japan and sent to me for identification. The specimen is identified as *N. trichiura* and reported herein as its third record from the western Pacific Ocean.

The infected fish was caught on 26 June 2020 with a set net installed in Kowaura Bay (the western North Pacific) off Maruwa (34°13′33″N, 136°29′00″E), Minami-Ise, Mie Prefecture. After the fish was identified using Nakabo (2013), photographed, and measured for total length (TL, mm), the isopod was carefully taken and frozen with sea water. Later, at the Aquaparasitology Laboratory, Shizuoka Prefecture, it was thawed, fixed and preserved in 70% ethanol, and examined using an Olympus SZX10 stereo microscope. The specimen of *N. trichiura* has been deposited in the Crustacea (Cr) collection of the National Museum of Nature and Science, Tsukuba, Ibaraki Prefecture (NSMT-Cr 28349). The scientific names of fishes mentioned in this paper follow Froese & Pauly (2019).

The ovigerous female of *N. trichiura* was found attached to the isthmus of *C. doederleinii* (302 mm TL) (Fig. 1A, B). The female lacked the left uropod, measuring 31.9 mm body length (from the anterior extremity of the cephalon to the posterior end of the pleotelson) and 12.7 mm maximum body width (across the widest pereonite). In Japan, *N. trichiura* was recently described using an ovigerous female from the same locality (Nagasawa & Isozaki, 2019). The specimen of *N. trichiura* collected (Fig. 1D–F) is characterized by the body 2.5 times as long as greatest width, widest at pereonite 6; cephalon anterior margin almost horizontal but slightly concave; eyes slightly visible; pereonite 1 anterior margin concave; pereonites 1–6 increasing in width; coxae 6 and 7 longer than 1–4; all pleonites visible; pleonite 1 widest; pleonites 2–5 decreasing in width; ventrolateral margins of pleonites 1 and
2 posteriorly directed and acute; pleotelson lateral margins curving to medial triangular point; uropod rami extending far beyond medial point of pleotelson; exopod more slender and much longer than endopod.

The known hosts of *N. trichiura* are all flyingfishes (Exocoetidae), including *Exocoetus volitans* Linnaeus, 1758, an unidentified species of *Exocoetus*, *Cheiropogon nigricans* (Bennet, 1840), *Cypselurus hiraii* Abe, 1953, and *Parexocoetus mento* (Valenciennes, 1847) (Ravichandran et al., 2019; see Nagasawa & Isozaki, 2019 for the literature). *Cheiropogon doederleinii* is herein regraded as a new host of *N. trichiura* and represents, following *Cypselurus hiraii*, the second host of the isopod in Japan. As *N. trichiura* is not a strictly host-specific parasite, the species may be discovered from other species of flyingfishes in Japanese waters, where 28 species of the Exocoetidae are known to occur (Motomura, 2020).

The ovigerous female of *N. trichiura* was oriented forward at its attachment site, and its cephalon and anterior marginal part of pereonite 1 were inserted into the host tissues (Fig. 1B). A circular wound (ca. 11 mm in diameter), where the muscles were exposed to water and four pairs of distinct scars were present, was formed under pereonites 1–5 (Fig. 1B, C). A similar wound was reported from *Cypselurus hiraii* infected by *N. trichiura* caught in the same locality (Nagasawa & Isozaki, 2019). As stated by Nagasawa & Isozaki (2019), the isopod’s feeding on and deep insertion of the pereopod’s dactyli to the host skin are considered to have induced such wounds at the attachment site.

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