

APAKAH CACING *WAWO* (Polychaeta, Annelida) HANYA ADA DI PERAIRAN MALUKU?

ARE *WAWO* WORMS (Polychaeta, Annelida) UNIQUE TO MALUKU WATERS?

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ABSTRAK

Penduduk asli Ambon meyakini bahwa cacing *wawo* adalah biota khas perairan Maluku. Studi kali ini bertujuan untuk membuktikan keberadaan hewan tersebut di luar perairan tersebut. Sampel penelitian diambil dari daerah pasang surut perairan Barrang Lompo (Sulawesi Selatan) dan Bitung (Sulawesi Utara). Dua jenis nereidid yang identik dengan cacing *wawo* yang biasa muncul di perairan Maluku ditemukan, yaitu *Perinereis helleri* (Grube, 1878) dan *P. nigropunctata* (Horst, 1889). Hal ini membuktikan bahwa hewan tersebut tidak hanya ada di perairan Maluku, namun memiliki distribusi geografis yang lebih luas di daerah tropis. Studi taksonomi diperlukan untuk mengungkap biodiversitas biota laut tersebut.

ABSTRACT

The natives of Ambon believe that *wawo* worms are unique to Maluku waters. The present study aimed to prove the presence of the animals outside of those areas. Samples were collected from the intertidal area of Barrang Lompo (South Sulawesi) and Bitung (North Sulawesi). We found two nereidid species identical to *wawo* species used to swarming in Maluku waters, i.e., *Perinereis helleri* (Grube, 1878) and *P. nigropunctata* (Horst, 1889), suggesting that the animals are not unique to Maluku waters and have a wider geographic distribution around the tropics. More taxonomic investigations are required to reveal the biodiversity of these poorly-studied marine creatures.

INTRODUCTION

Wawo, or more popularly known as *laor* among the Ambonese, is a group of edible polychaete species (Annelida) annually swarming in Maluku waters either in February or March (Pamungkas 2009, 2011, 2015). The first note on *wawo* was probably by Rumphius (1705), yet the animals were officially described for the first time as a single species by Horst (1905), i.e., *Lysidice oele* (Eunicidae). Later studies then suggested that *wawo* worms are multispecies with eunicids and nereidids dominating the species composition (Martens *et al.* 1995; Pamungkas 2015; Pamungkas & Glasby 2015).

To date, the natives of Ambon and its surrounding islands believe that *wawo* worms

are unique to Maluku waters as there has been no evidence of the presence of the animals outside of the areas (*nyale* and *palolo* worms, i.e., edible polychaetes swarming in Nusa Tenggara (Indonesia) and Samoa, respectively, are often regarded as different species). In the present study, we tried to see if some species of *wawo* also occur outside of Maluku waters.

MATERIALS AND METHODS

This study was conducted on 14-19th December 2017 at two locations, i.e., Barrang Lompo in South Sulawesi and Bitung in North Sulawesi. Samples were obtained from the intertidal area by cracking reef rubble using a hammer. Worms observed were picked using tweezers and were immediately moved into a

jar filled with 70% alcohol. The animals were then sorted and identified using both stereo and compound microscopes in the laboratory. In the present work, we focused on identifying nereidid specimens as wawo species belonging to this family are best-studied (Pamungkas & Glasby 2015). To identify the nereidid specimens to species level, we observed both the type and the arrangement of the animals' paragnaths on their proboscis. When the proboscis is not everted, we dissected the animals' mouth. To perform this, an incision just to one side of the animals' ventral midline was made by pushing one tip of scissors into the mouth as far as possible. The cutting through both the outer body wall and the pharyngeal tube was thereafter done all at once to about chaetiger 5. A tweezers was used to keep the dissection open for paragnaths observation.

RESULTS AND DISCUSSION

We found two nereidid species that are identical to wawo species swarming in Maluku waters identified by Pamungkas & Glasby (2015), i.e., *Perinereis helleri* (Grube, 1878) in Bitung (1 specimen) and *P. nigropunctata* (Horst, 1889) in Barrang Lompo (5 specimens) (Table 1 & Figure 1). Members of the genus *Perinereis* Kinberg, 1865 are characterised by

two types of paragnaths on their proboscis, i.e., conical paragnath (cp) and bar paragnath (bp). More detailed examination of the proboscis of both species shows that the paragnath arrangement for *P. helleri* is: area I (2 or 3 cp), area II (about 8 cp), area III (about 15 cp), area IV (about 20 cp), area V (3 cp), area VI (1 bp), area VII-VIII (about 25 cp). Whereas for *P. nigropunctata*, the arrangement is: area I (around 8 cp), area II (around 18 cp), area III (around 30 cp), area IV (around 30 cp), area V (3 cp), area VI (1 bp), area VII-VIII (around 35 cp) (Figure 2). The specimens are deposited at the Museum Zoologicum Bogoriense (MZB) in Cibinong, Bogor, Indonesia, with catalogue numbers MZB. Pol. 00225 and MZB. Pol. 00226 for *P. helleri* and *P. nigropunctata*, respectively.

The present study showed that two wawo species also occurred outside of Maluku waters, particularly in coastal areas with reef rubble. The number of wawo species identified in this study was much lower than that in Pamungkas & Glasby (2015) (Table 1) due to limited reef rubble in Barrang Lompo and Bitung.

The geographic distribution of *P. helleri* and *P. nigropunctata* is, in fact, known to be more expansive, i.e., outside of Indonesian waters. *Perinereis helleri*, for example, was

Table 1. Nereidid species of wawo identified from three different locations. The symbols '+' and '-' indicate the presence and absence of the species in the corresponding location, respectively.

Species	Location		
	Ambon*	Barrang Lompo	Bitung
<i>Ceratonereis singularis australis</i> Hartmann-Schröder, 1985	+	-	-
<i>Composetia marmorata</i> (Horst, 1924)	+	-	-
<i>Neanthes</i> sp. cf. <i>N. gisserana</i> (Horst, 1924)	+	-	-
<i>Neanthes</i> sp. cf. <i>N. masalacensis</i> (Grube, 1878)	+	-	-
<i>Neanthes unifasciata</i> (Willey, 1905)	+	-	-
<i>Nereis</i> sp_Ambon_NTMW19037	+	-	-
<i>Perinereis helleri</i> (Grube, 1878)	+	-	+
<i>Perinereis nigropunctata</i> (Horst, 1889)	+	+	-
<i>Solomonereis merauensis</i> Gibbs, 1971	+	-	-

* Pamungkas & Glasby (2015)



Figure 1. *Perinereis helleri* (left) and *P. nigropunctata* (right). Bar scale = 1 mm.



Figure 2. *Perinereis nigropunctata* with everted proboscis. Dorsal (left) and ventral (right) views of the organ showing the type and the arrangement of the paragnaths. Bar scale = 1 mm.

originally discovered from Philippine waters (Grube 1878) yet was later reported to occur off Cocos Island in west of Costa Rica (Treadwell 1928) as well as in Australia, Chile and India (Hutchings *et al.* 1991). Similarly, *P. nigropunctata* was first discovered from Malaysian waters, but was also known to occur in some parts of Australia (Augener 1992; Hutchings *et al.* 1991), Chilika Lake (near the Indian Ocean), India (Southern 1921), Madagascar, Marshall Islands, Singapore (Hutchings *et al.* 1991) and southern Africa (Day 1967).

Besides nereidids, one eunicid *wawo* species identified by Martens *et al.* (1995) from Ambonese waters, i.e., *Palola viridis* Gray in Stair, 1847, was also reported outside of Maluku waters; the species is recognised as the well-known Pacific *palolo* (we suspect that some of unidentified eunicid species of *wawo* in Pamungkas (2015) are possibly of the same species as *palolo* and *nyale* worms as members of the family Eunicidae are typically able to perform epitoky). The notion that *wawo* worms are exclusive to Maluku waters is apparently due to Radjawane (1982)

reporting that *wawo* was a single species *L. oele* as studied by Horst (1905); this species has not been reported elsewhere to date and is one of endemic polychaete species of Indonesia (Pamungkas *et al.* 2021).

Furthermore, the belief also persists as polychaete biodiversity studies conducted by local scientists have generally failed to identify polychaete specimens to species level due to limited taxonomic information on Indonesian polychaetes and lack of local polychaete taxonomists (Pamungkas & Glasby 2019). The identification of eunicid *wawo* is particularly difficult as they mostly occur in the form of headless epitokes during swarming (Pamungkas 2015). As a result, the same *wawo* species that occur elsewhere remain unnoticed. Additionally, the tradition of consuming polychaete worms is limited to a few regions only (Pamungkas 2009), resulting in the phenomenon being unexposed in other parts of the country.

CONCLUSIONS

We here highlight that *wawo* worms are multispecies and have a relatively broad geographic distribution; they inhabit rocky shores around the tropics. These animals' species richness, unfortunately, remains poorly-studied – except the nereidids, other *wawo* species remain unidentified. More taxonomic studies on the fauna, including molecular approaches, are thus required.

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