Entomology

First record of polychaete worm of Genus *Perinereis* (Annelida: Nereididae) from the intertidal coast of Bhuigaon, Vasai, Maharashtra, India

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Abstract

This study documents the first record of occurrence of genus *Perinereis* along the coast of Bhuigaon, Maharashtra. The specimen was found in the intertidal zone of the beach on a patch of sand and was collected for further examination. We identified the worm to be of genus *Perinereis* based on gross morphological characters however due to the difficult identification of individuals from *Perinereis* precise identification of species was not possible and hence our study only documents the genus level presence in Bhuigaon. Our study also further highlights the ecological importance of the coast of Bhuigaon and its rich intertidal diversity.

Keywords: Polychaete worm, *Perinereis and* Bhuigaon

Introduction

Intertidal organisms have always been an interest of study for many scientists. Intertidal invertebrates and macroalgae occupy low trophic levels and are responding quicker to alterations in climate than species at higher trophic levels [1]. They often show the first response in a cascade of effects up the food chain and are therefore important sentinels of climate change impacts [2]. In addition to temperature, several other climate-related drivers are also impacting and have adverse effects upon coastal habitats including sea level rise, increases in relative wave height and storminess, and the associated secondary effects arising from adaptation and mitigation activities in coastal regions [3]. One such group of organisms is called polychaete worms; these worms play a key role in ecosystems in which they thrive and are important to assess environmental quality. [4,5,6]. Nereididae (Blainville 1818) is probably the most well-known family of Polychaeta, with 44 genera and 677 species [7]. Animals belonging to this family are always major components of the macro-benthic fauna in marine and estuarine play an important role in the nutrient cycle [8] . Of this family one of the most diverse genera is *Perinereis* [9] The genus *Perinereis* is commonly found near seas in fresh and brackish waters and dwell from shallow to abyssal zones in a wide range of habitats, such as soft sediments, rocky and coral substrates, algae rhizoids, mangrove and seagrass roots, oyster reefs, and among others [10,11]. Species of genus *Perinereis* are often difficult to identify as they have similar paragnath patterns, overall body features and lack of detailed systematic studies [12,13]. Genus *perinereis* is fairly common along the coast of Mumbai and has been part of many studies with description of new species [14,15], although there is no such record present for the coast of Vasai-Virar. Hence our report is the first for this region.

Materials and methods

The coast of Bhuigaon has been a part of many scientific studies. It lies on the western coast of India in between Vasai and Virar region. The coast is characterised by its rich intertidal diversity and its unique geomorphology of having both sandy type of shore and rocky type of shore which harbour diverse organisms ranging from multiple taxonomic groups. The beach has a river connected to it hence supporting estuarine habitat. Anthropogenic activities like fishing and tourism are actively participated but on a sparse level.

Fig 1: Collection site Map

The worm was found in the intertidal zone of the beach on sand, photographs were taken of the worm and the worm was brought back to the Research lab of Department of Zoology, Annasaheb Vartak college of Arts, Kedarnath Malhotra College of Commerce, E.S. Andrades College of Science, Vasai, Palghar (M.S), India. for further examination. The worm was stored in 70% alcohol upon bringing it to the lab. Microscopic examination was done on a 10X binocular microscope and photography was done using Samsung S24. Enhancing of image was done using Adobe lightroom software. Identification of the specimen was done using guides [16,17,18].

Result and Discussion

The worm was greenish in color all throughout the body, the head region was dark red in color. The body had a total 158 segments and around 305 parapodia. There was a single blood vessel flowing from the head all the way to the tail of the worm. Further microscopic analysis was done and characteristics were recorded and noted. Upon analysis we described the specimen in a detailed and appropriate manner.

Prostomium (PR) was distinct and could be easily distinguished, Prostomial palps (PA) were clearly visible which are pointed in morphology. Prostomial cirri (TC) were present which were pointed in morphology with smooth texture. Everted proboscis (EP) was distinctly observed. The jaw (MD) was observed to be curved and hooked with very minute dentitions near the base and the color of the jaw is dark without any opaqueness. Paragnaths (PGs) are faint but visible. Pereistomium (PE) is also distinct with faintly visible paragnaths (PGs). Eye spots were faintly visible. Parapodia (PP) were clearly visible with distinct tufts. Notopodium and Neuropodium regions of parapodia were also clearly seen. Parapodia are observed to be in pairs and only a single pair of parapodia are present on a single segment. Parapodia are biamarous. Setae (SE) distinct with spiny morphology and each parapodia contained 3-7 setae. The setae were very much present outward of the tufts (TU). Clear segmentation is seen in the posterior region. Posterior tufts (PTU) distinct from the body. Anus (AN) is also distinctly visible. Tail region ends in a blunt and stout manner.

The specimen was identified to belong to the Genus *Perinereis* due to the similar morphological structures of jaw, head region, parapodia arrangement, setae structure and morphology, Tail morphology [16,17,18].

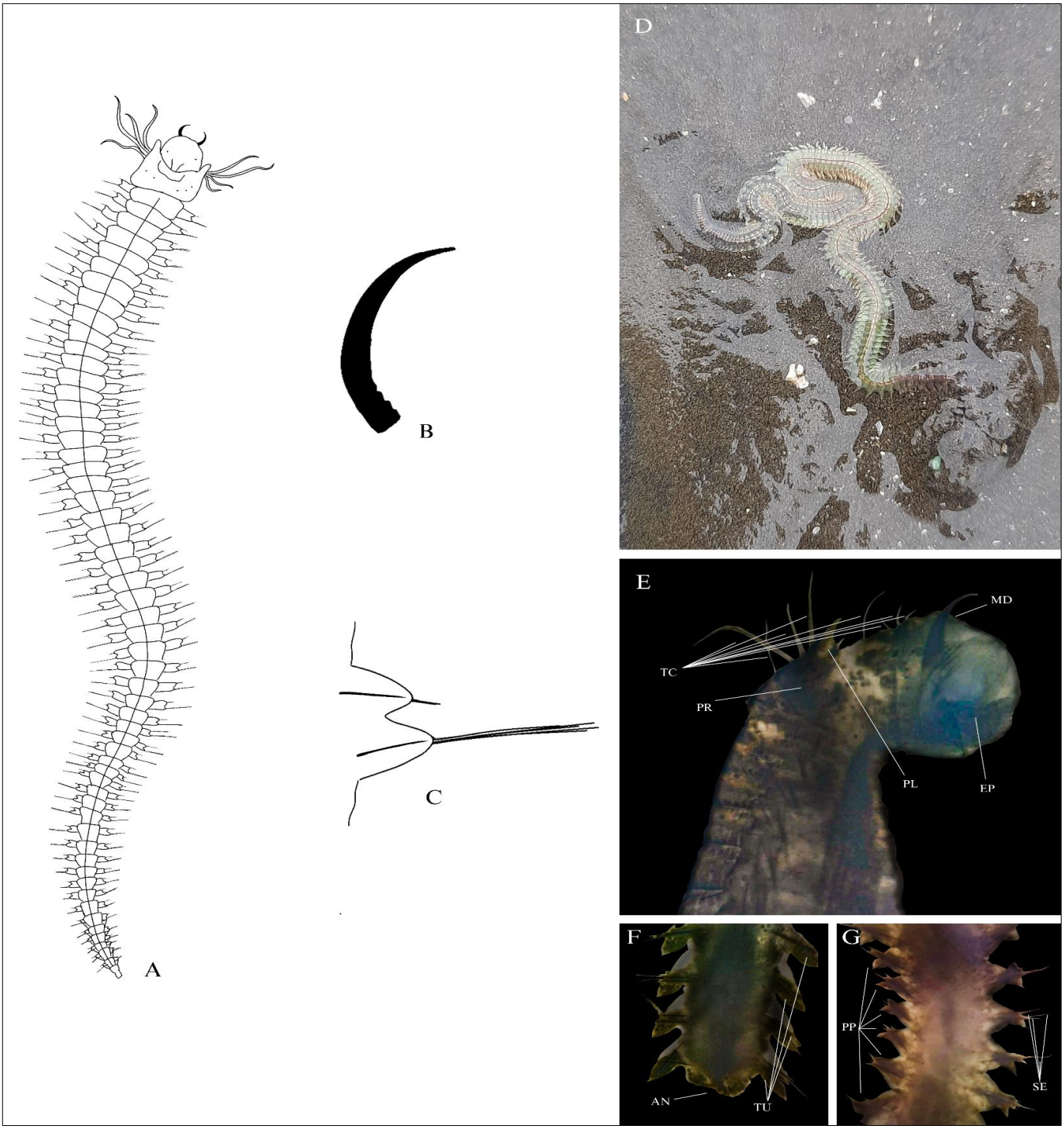

Fig 2: Diagrammatic reconstruction of observed specimen **(A)**, diagrammatic representation of jaw **(B)**, diagrammatic representation of Parapodia showing setae **(C)**, image of worm from site of collection **(D)**, microscopic images of anterior region (E) showing tentacular cirri (TC), palps (PA), prostomium (PR), jaw (MD), everted proboscis (ER) , posterior region **(F)** anus (AN) and tufts (TU) and mid body **(G)** showing parapodia (PP) and setae (SE)

Conclusion

Hence our study should only be considered as a genus level first occurrence. Due to the difficult nature of identification of *Perinereis* species we were not able to identify the exact species of our specimen. although whatever characters observed were sufficient enough to confirm that the specimen belongs to *Perinereis.* Our study also further expands the current known range of *Perinereis*. Hence our study is important for biodiversity records and also, we aim to further conduct more studies on this.

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