



## POLYCHAETE DIVERSITY OF COCHIN, SOUTH WEST COAST OF INDIA

## Environmental Research

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## ABSTRACT

Polychaetes are usually the most abundant taxon among the benthic communities and have been most often utilized as indicator species to know the environmental conditions of an area. Recent efforts have therefore been concentrated in updating the taxonomic position of polychaete species. Polychaete species are known to occur in appreciable densities in the Cochin area. The taxonomic investigation of the present study can form a baseline for future monitoring programmes in this area. Based on the above said information, the polychaete diversity in the proposed study area was surveyed and assessed with the objective to identify the presence of polychaete species in Cochin area. Three stations were sampled at random for the study of polychaetes taxonomy and a total of 20 species were identified from the area. Out of this 16 are reported for the first time from the study area.

## KEYWORDS

Polychaetes, Diversity, Taxonomic Investigation, Cochin

## INTRODUCTION

Polychaetes are distributed in all oceans of the world and at all depths of the water column. They are found in unique habitats, but are especially abundant in the benthos where they constitute 35-70% of macro invertebrate populations. Polychaetes respond to cumulative factors of natural and anthropogenic origin, and thus are useful for detecting environmental alterations. Some polychaetes play a similar ecological role in the ocean as earthworms do on land by burrowing and ingesting sediments. Polychaetes modify geochemical gradients, redistribute organic matter and change the hydrodynamics above the sediment layer. Because of their abundance, polychaetes are important in assessing the ecological state of marine environments (Victoria & Donald, 2009). The species of polychaetes have a high level of tolerance to both pollution and natural perturbations (Sunil Kumar 1996). Southern (1921) described the polychaetes of Cochin backwaters and Cheriyan (1966) described six species of polychaetes collected from Cochin harbour area. Sunil Kumar (1995 & 1996) and Sunil Kumar & Antony (1994a) studied the polychaetes of Cochin backwaters. Among the 34 estuaries found in the south west coast of India, the largest number (19) of polychaete species were recorded in the Cochin estuary by Ajmal Khan and Murugesan in the year 2005. Benthos of Cochin back waters were studied by Sheeba (2000) and Feebarani & Damodaran (2014). A detailed systematic work on the complete polychaete fauna of the Cochin area is lacking. Hence, an attempt was made to study the polychaetes with special reference to their systematics in three different regions in Cochin area.

## MATERIAL AND METHODS

The present study was carried out by taking samples from three regions (Fig. 1) such as Cherai beach (Lat. 10°08'31"N and Long. 76°10'41"E), Narakkal backwater (Lat. 10°02'10"N and Long. 76°12'34"E), and Cochin fort (Lat. 09°58' 06" and Long. 76°14'35" E) during the year 2019. Sediment samples were collected by using Peterson's grab at a depth of 10m from Narakkal backwater and from other two stations namely Cherai beach and Cochin fort, samples were collected by scoop. The mud samples collected were sieved through a 500 micron mesh sieve and the fauna was preserved in 7% formaldehyde buffered with sea water (Strin, 1981) for taxonomic identification and for future studies. Preserved samples were brought to the laboratory and sorted out immediately. Slide mounts were made for examining microscopic details of systematically important structures taken from preserved individuals. Samples were identified using standard keys (Fabricius, 1780; Echlors, 1908; Southern, 1921; Fauvel, 1953; Day, 1961, 1963a, 1967; and Michael, 1986) after drawing the figures using Camera Lucida and taking colour photos

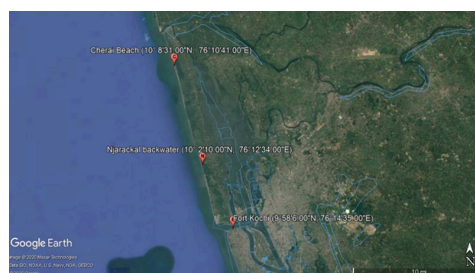


Fig. 1. Field map of the study area

## RESULTS AND DISCUSSION

A total of 20 species as per the list given in Table 1, belonging to 17 genera under 13 families were found in the present study. Out of this, 16 species as marked in the above table were found to be new records to the study area. Out of 20 species recorded, 12 were from the Cherai beach, 14 from Narakkal backwater and 14 from Cochin fort region. Among these, *Capitella capitata* and *Eunice indica* were present in all stations. More number of species were found in Narakkal backwater and Cochin fort regions. Most of the polychaetes were collected belong to Nereidae, Eunicidae, and Spionidae families. The remaining species were from the families Terebellidae, Cirratulidae, Lysaretidae, Capitellidae, Polynoidae, Nephtyidae, Sabellidae, Pilargidae, Scalibregmidae and Onuphidae. Out of these, *Capitella* sp., *Marphysa* sp., *Polycirrus* sp., and *Nephtys* sp. were reported only up to genus level by Feebarani (2014). *Ancistrosyllis cf. constricta* was reported by Feebarani (2014), Pillai (2001), Amar Musale *et al.* (2010), Geetha (2015) and Sunil Kumar (2001 and 2003), *Capitella capitata* was reported by Sarala Devi *et al.* (1999) and Geetha *et al.* (2015), *Polydora capensis* was reported by Sivaleela *et al.* (2012) and *Nephtys dibranchis* was reported by Geetha *et al.* (2015), Joydas *et al.* (2008), Sarala Devi (1999) and Smitha (2011). Remaining species namely *Eunice pennata*, *Eunice schemacephala*, *Eunice indica*, *Marphysa corallina*, *Polydora onagawaensis*, *Polycirrus rosea*, *Culleriella acicula*, *Oenone fulgida*, *Harmothoe charlatta*, *Fabricia bansei*, *Scalibregma inflatum*, *Nothria mannarensis*, *Neanthes oxyopoda*, *Pseudonereis variegata*, *Laeonereis ankyloseta*, and *Platynereis dumerilli* are reported for the first time from the study area in this account. The concentration of more number of polychaetes in this region indicates the fairly good benthic condition of the study area. The present investigation has found more number of species in the study area and this is an useful information for polychaete taxonomy and its future biodiversity studies.

**Table. 1. List of polychaete species collected from the study areas.**

| Sl. No | Species Name                         | Family Name    | Cherai beach<br>(Station 1) | Narakkal backwater<br>(Station 2) | Kochi fort<br>(Station 3) |
|--------|--------------------------------------|----------------|-----------------------------|-----------------------------------|---------------------------|
| 1      | <i>Eunice pennata</i> *              | Eunicidae      |                             | +                                 | +                         |
| 2      | <i>Eunice schemacephala</i> *        | Eunicidae      | +                           |                                   | +                         |
| 3      | <i>Eunice indica</i> *               | Eunicidae      | +                           | +                                 | +                         |
| 4      | <i>Marphysa corallina</i> *          | Eunicidae      |                             | +                                 | +                         |
| 5      | <i>Polydora capensis</i>             | Spionidae      | +                           | +                                 |                           |
| 6      | <i>Polydora onagawaensis</i> *       | Spionidae      |                             | +                                 | +                         |
| 7      | <i>Polycirrus rosea</i> *            | Terebellidae   | +                           |                                   |                           |
| 8      | <i>Culleriella acicula</i> *         | Cirratulidae   | +                           |                                   | +                         |
| 9      | <i>Oenone fulgida</i> *              | Lysaretidae    |                             | +                                 |                           |
| 10     | <i>Capitella capitata</i>            | Capitellidae   | +                           | +                                 | +                         |
| 11     | <i>Harmothoe charlatta</i> *         | Polynoidae     | +                           | +                                 |                           |
| 12     | <i>Fabricia bansei</i> *             | Sabellidae     |                             | +                                 | +                         |
| 13     | <i>Ancistrosyllis cf. constricta</i> | Pilargidae     | +                           |                                   | +                         |
| 14     | <i>Scalibregma inflatum</i> *        | Scalibregmidae | +                           | +                                 |                           |
| 15     | <i>Nothria mannarensis</i> *         | Onuphidae      |                             | +                                 | +                         |
| 16     | <i>Neanthes oxypoda</i> *            | Nereidae       | +                           |                                   | +                         |
| 17     | <i>Pseudonereis variegata</i> *      | Nereidae       | +                           | +                                 |                           |
| 18     | <i>Laonereis ankyloseta</i> *        | Nereidae       |                             | +                                 | +                         |
| 19     | <i>Nephtys dibranchis</i>            | Nephtyidae     | +                           |                                   | +                         |
| 20     | <i>Platynereis dumerilli</i> *       | Nereidae       |                             | +                                 | +                         |

\*New records

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