

Standardizing Polychaete Taxonomy for the Improvement of Marine Ecology and Conservation Studies on the Indian Subcontinent.

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Introduction

Taxonomy plays a fundamental role in ecological studies and biodiversity conservation. Hence, accurate species identification is crucial. Polychaetes dominate the macrofaunal community, in most habitats along the Indian coast. Unfortunately, little progress has been made in Indian polychaete taxonomy since 1953. Regional polychaete taxonomy is hindered by lack of adequate taxonomic descriptions and skills.

Present Status of Taxonomy

- Current identifications are based on Fauvel (1953) and Day (1967). Hartman 1974a,b and more recently published works are rarely cited or used in current studies
- Fauvel (1953): *The Fauna of India Including Pakistan, Ceylon, Burma and Malaya*, Vol I & II.
- Day (1967): *A Monograph on the Polychaeta of Southern Africa*.
- Olga Hartman's papers (1974a, 1974b) based on 1st International Indian Ocean Expedition.

Difficulties with Fauvel's & Day's monographs

- Multiple records exist for species described from Europe and other regions which most likely do not occur in Indian waters.
- Native species are misidentified as European species
- Taxonomic usage is outdated & descriptions are inadequate

E.g. 1: 'The *Paraprionospio pinnata*' Problem

Fauvel (1953) reported *Prionospio pinnata* Moore (described from Chile) in Indian waters. Even today most Indian papers list *Prionospio.pinnata* although some have *Paraprionospio pinnata*

Yokoyama & Sukumaran (2012) reported 3 species: *Paraprionospio cordifolia* (Yokoyama 2007), *P. cristata* (Zhou, Yokoyama & Li 2008), *P. patiens* (Yokoyama 2007), and suggested that *P. pinnata* does not occur in India

- Paraprionospio spp.*: are dominant in many macrobenthic communities along the Indian coast.
- Wide distribution along the Indian coast
- First species that colonizes after natural (monsoonal) or anthropogenic defaunation (Sivasdas et al 2012)
- Dominates upwelling region and oxygen minimum zones.

E.g. 2: *Ancistrosyllis constricta*

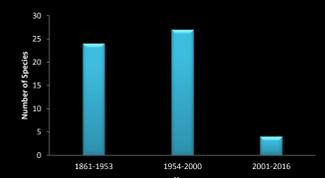
Fauvel (1953): *A. constricta* described in family Hesionidae. *A. constricta* was placed in genus *Sigambra*, however this species is still reported as *A. constricta*

Sigambra parva (described from South Africa) and *S. tentaculata* (from New York, NE Atlantic) are also reported from India

Sigambra species are abundant in hypoxic habitats. Indian specimens need to be revised using current literature to accurately delineate the species

Polychaete species from India

- 1861-1953: 304 species (Fauvel, 1953)
- 1954-2015: 267 species added (bioSearch.in)



- New records: 213 species, however, 74 of these have European or eastern Pacific type localities (WoRms)
- 31 new species described since 1953

Why accurate Identification is needed

- Benthic fauna are reliable bioindicators.
- Biotic indices developed in temperate regions are efficient in assessing tropical ecosystem (Sivasdas et al 2016).
- Most biotic indices are based on classifying species into five ecological groups.
- Therefore, accurate species identification is required.

Problems in marine ecology studies

- Ecological groupings based on genus may be incorrect: e.g.: *Magelona* spp., is described as Ecological group II in AZTI's database but in Indian waters: *Magelona* sp. shows EG III character (Sivasdas et al. 2016).
- Identification for ecological studies is often restricted to genus level
- Level due to lack of experience taxonomists, lack of literature, and time constraints. Lack of competent taxonomists.
- Number of species and abundance per species is often under-estimated
- Number of introduced species may be over-estimated and phylogeography incorrectly assessed

Future Plans

- Revise the Indian species reported by Fauvel and other authors, paying special attention to species described from other parts of the world
- Re-describe Indian species according to current standards
- Urgent need for national and international level of networking to standardize polychaete taxonomy on the Indian sub-continent.
- Train Indian researchers & collaborate on projects

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