



# International Journal of Fisheries and Aquatic Studies

E-ISSN: 2347-5129

P-ISSN: 2394-0506

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.549

IJFAS 2017; 5(1): 216-219

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www.fisheriesjournal.com

Received: 01-11-2016

Accepted: 02-12-2016

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## Diversity status of benthic macro polychaetes species in estuarine region of Karwar, West Coast of India

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### Abstract

Polychaetes play an important role in the food chain of estuarine ecosystem, especially fisheries point of view. For the present study monthly survey in two mangroves and one mouth area in Kali estuary Karwar were carried out from March 2015 to March 2016. Species diversity of benthic macro polychaetes of 61-species, 25-families have been studied, Out of those under Errentia group (9-species) were dominant compared to Senteria group (16-species). Among identified 25-families, the species diversity were found to be high in family Neriedae, Eunicidae, Glyceriedae, Capitallidae, Phyllodidae, Sabellaridae.

**Keywords:** Kali estuary, diversity, macro polychaetes, mangrove

### 1. Introduction

Estuarine environment are vital habitats for many species of fish, crustaceans and molluscs spawning grounds, nurseries and feeding grounds and also important for early growth. Tropical estuaries harbouring mangrove forests have considerable additional input of humic substances. (Schaeffer Novelli, 1989) and increased concentrations of nutrients dissolved in the water column which further favours primary production. Mangrove ecosystem is one of the most productive ecosystem of tropical and sub-tropical regions of the world, due to availability of the organic matter, in these habitats playing the role on maintaining the ecological complexity to manipulate the diversity and distribution of animals (Liu *et al.* 2006). macro polychaetes are one of the major benthic group of animals like Molluscs and Crustaceans. Majority of species are quite smaller but short lived exhibiting a higher secondary production. They plays an important role in assessing ecological condition of a given ecosystem and EIA studies. Benthic macro polychaetes form an important component of the food chain. River Kali exhibits different types of biotopes such as estuary, mangrove, backwater, fresh water. Hence, this is an attempt to study the species diversity of macro polychaetes of estuarine mouth and mangroves of Kali estuary.

### 2. Materials and Methods

#### Study area

To study the species diversity of benthic macro polychaetes in Kali estuary three stations were selected.

**Station I: (Mavinhole) (Mangrove ecosystem):** Location (14° 52' 04 01" N, 74° 07' 17 87" E) The Mavinahole creek is situated towards the northern stern part of the river mouth. This creek is rich in mangrove vegetation and diverse group of mangrove and associates.

**Station II: (Kali estuary-mouth) Kodibag (Estuarine ecosystem):** Location (14° 50' 24 06" N, 74° 07' 38 53" E) The site lies on the southern bank of estuarine mouth extending up to 1-2 Kms. This station is characterized by high saline water. The nature of the bottom is admixture of sand and mud with depth varying from 1-3 meters during low tide.

**Station III: (Sunkeri) (Mangrove ecosystem):** Location ( 14° 50' 12 59" N 74° 10' 02 65" E) The study site is a swamp under tidal influence. This is about 5 Kms. from the river mouth on the south bank. It is in the broadest back water of the river (about 1Km. wide) running south to a distance of about 3Kms. There is a bund built across the back water with gates.

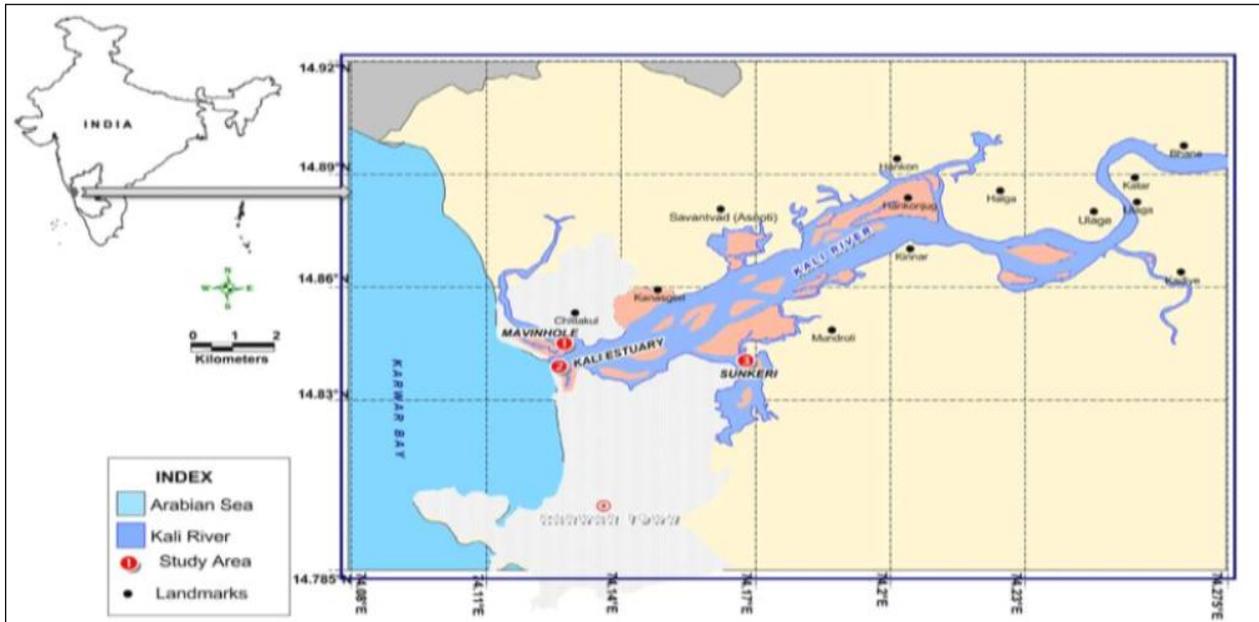
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The soil is clayey loam in texture under the vegetal cover. Samples were collected by using hand core, box cover and Van-veen grab in mangrove soil. Polychaetes were collected after sieving the samples through 500 micron mesh sieve.

They were counted and biomass was taken. Population density was expressed in No.s/m<sup>2</sup>. area. Sedimentological and Hydrological parameters were recorded.



Map 1: Showing the locations of the study area in Kali River

**3. Results**

List of Polychaetes in Kali estuary is given in Table1. 61-species of polychaetes have been listed; all the species were collected from mangrove and estuarine area. Species are grouped into Errantia and Sedentaria based on their burrowing

nature. Of the 9-families Errantia group, Nereidae (10-species), Eunicidae (5-species) and Glyceridae (3-species). The Sedentaria consists of 16-families and between this the Capitellidae (4-species) and Spionidae (5-species) showed high diversity and richness.

Table 1: List of Macro polychaetes fauna in Mangroves and Estuary in Karwar (Kali estuary) (present+ absent -)

Sl. No.	Species	Family	Stn1 (Mangrove)	Stn.2 (Estuary)	Stn.3 (Mangrove)
1	<i>Amphicteis gunneri</i>	Ampharetidae	+	-	+
2	<i>Amphicteis spp.</i>	Ampharetidae	+	-	+
3	<i>Ancistrosyllis constricta</i>	Pilargidae	+	+	+
4	<i>Capitella capitata</i>	Capitellidae	+	+	+
5	<i>Capitella spp.</i>	Capitellidae	+	-	+
6	<i>Ceratonereis costae</i>	Nereidae	+	-	+
7	<i>Dendronereis aestuarina</i>	Nereidae	+	+	+
8	<i>Dendronereis arborifera</i>	Nereidae	+	+	+
9	<i>Dendronereis heteropoda</i>	Nereidae	+	+	+
10	<i>Diopatra neapolitana</i>	Eunicidae	+	+	+
11	<i>Diopatra spp.</i>	Eunicidae	+	-	+
12	<i>Eteon spp.</i>	Phyllodocidae	+	-	+
13	<i>Eunice spp.</i>	Eunicidae	+	-	+
14	<i>Eunice tubifex</i>	Eunicidae	+	-	+
15	<i>Exoene spp.</i>	Syllidae	+	-	+
16	<i>Glycera alba</i>	Glyceridae	+	-	+
17	<i>Glycera longipinnis</i>	Glyceridae	+	+	+
18	<i>Glycera spp.</i>	Glyceridae	+	+	+
19	<i>Goniada spp.</i>	Gonididae	+	-	+
20	<i>Heteromastus spp</i>	Capitellidae	+	-	+
21	<i>Lavensia</i>	Nereidae	+	-	+
22	<i>Lepidonotus tenuisetous</i>	Aphroditidae	+	-	+
23	<i>Lumbriconereis heteropoda</i>	Lumbrineridae	+	-	+
24	<i>Lumbriconereis polydesma</i>	Lumbrineridae	+	-	+
25	<i>Lumbriconereis aberrans</i>	Lumbrineridae	+	-	+
26	<i>Lumbriconereis latreilli</i>	Lumbrineridae	+	-	+
27	<i>Lumbriconereis pseudobifilaris</i>	Lumbrineridae	+	-	+
28	<i>Lumbriconereis simplex</i>	Lumbrineridae	+	-	+
29	<i>Lumbriconereis spp.</i>	Lumbrineridae	+	-	+

30	<i>Lycastis indica</i>	Nereidae	+	-	+
31	<i>Magelona spp.</i>	Magelonidae	+	+	+
32	<i>Magelona papillicornis</i>	Magelonidae	+	-	+
33	<i>Malacoceros indicus</i>	Spionidae	+	-	+
34	<i>Maldanella capensis</i>	Maldinidae	+	+	+
35	<i>Marphysa spp.</i>	Eunicidae	+	+	+
36	<i>Mediomastus spp.</i>	Capitellidae	+	-	+
37	<i>Neries oligobranchia</i>	Nereidae	+	+	+
38	<i>Nephtys polybranchia</i>	Nephtyidae	+	+	+
39	<i>Nephtys spp.</i>	Nephtyidae	+	+	+
40	<i>Neries spp.</i>	Nereidae	+	+	+
41	<i>Onuphis spp.</i>	Onuphidae	+	-	+
42	<i>Opheliide spp.</i>	Opheliidae	+	-	+
43	<i>Ophiodromous spp.</i>	Hesionidae	+	-	+
44	<i>Opisthosyllis spp.</i>	Syllidae	+	-	+
45	<i>Owenia spp.</i>	Oweniidae	+	-	+
46	<i>Perineries cavifrons</i>	Nereidae	+	-	+
47	<i>Perineries spp.</i>	Nereidae	+	-	+
48	<i>Phyllochaetopterus spp.</i>	Chaetopteridae	+	-	+
49	<i>Phyllodoce spp.</i>	Phyllodocidae	+	-	+
50	<i>Pista indica</i>	Teribellidae	+	-	+
51	<i>Polydora spp.</i>	Spionidae	+	+	+
52	<i>Prinospio cirrifera</i>	Spionidae	+	+	+
53	<i>Prinospio pinnata</i>	Spionidae	+	+	+
54	<i>Prinospio polybranchiata</i>	Spionidae	+	-	+
55	<i>Sabellaria spp.</i>	Sabellaridae	+	+	+
56	<i>Scoloplos spp.</i>	Orbinidae	-	-	-
57	<i>Serpula vermicularis</i>	Serpulidae	+	-	+
58	<i>Sternapsis scutata</i>	Sternapsidae	-	-	-
59	<i>Sthenelais boa</i>	Aphroditidae	-	-	-
60	<i>Terebellid spp.</i>	Teribellidae	+	+	+
61	<i>Terebellid stromi</i>	Teribellidae	+	+	+

In the present assessment 61- species have been studied in Kali estuary mangrove and estuarine mouth. Errentia group polychaetes are more active in burrowing, among the identified 13-families in Kali estuary and mangroves the species diversity of Nereid, Spionidae, Eunicidae, Glyceridae, Sabellaridae, Terebellidae were found to be higher in numbers. The members of the genera Neries, Lumbrineris, Glyceridae were dominant among the polychaete species.

#### Species diversity of Nereidae and Eunicidae

The Nereidae and Eunicidae members were found higher interms of diversity next to that Glyceridae Spionidae and Capitellidae shows diversity (Table1) Among Nereidae the genera Dendroneries, Neries among Eunicidae the genera Lumbrineris contributed high species.

#### Polychaete adaptations to Mangrove habitats

The polychaete species encountered in mangrove soil have certain adaptations for survival. Polychaetes have a mucus secreting devices which is used to protect themselves in adverse conditions in estuarine habitat. Polychaetes found throughout the year are euryhaline and highly adapted to the peculiar characteristics of mangrove environment.

#### Role of Macro Polychaetes in Mangrove

Macro polychaetes plays a very important role in the recycling of organic materials formed during mangrove litter decomposition and detritus formed and nutrients release productivity. The biomass of polychaetes is used as a food source into the mangrove detrial particularly by commercially important aquatic organisms mainly benthic feeders of mangrove ecosystem. Some of the macro polychaete species under the families like Nereidae, Nephtyidae, Onuphidae,

Eunicidae, Spoinidae, Maladanidae, Sabellariidae etc. area the major biomass producing annelids. These form an important food for prawns and fishes. Similarly bivalves like mussels, clams, rock oysters, edible oysters these provide stability to soil inhabitants and their diversity and species abundance. Polychaetes play a major role in the mangrove soil fertility.

#### 4. Discussion

Kali estuary is one of the rich areas of macro polychaete diversity. The present study substantiates the richness and diversity of macro polychaetes in Karwar mangroves. Among the three ecosystems estuarine mouth mangrove ecosystem is more pristine in nature than the mangrove patch and mangrove forest ecosystem. Benthic macro polychaetes species assemblage is comparatively high in station (III) than station (I) and (II). The present study indicates higher polychaete diversity as compared to earlier reports (Harakantra *et al.* 1982), in estuarine region (Bhat U.G. and Neelakantan B. (1985). The present observation shows that macro polychaetes are the dominant species among macro benthos. Polychaetes has been observed earlier by Sankar G. in Muthupet lagoon, Sunil Kumar in Cochin backwaters, Prabha Devi L. in Coleroon estuary, and Ansari ZA *et al.* in Mandavi estury, RP and Gokhale KS, reported the dominance of polychaetes in mangrove ecosystem. The macro polychaete families like Nereidae, Nephtyidae, Onuphidae, Eunicidae, Spoinidae, Maladanidae, Sabellariidae etc. area the dominant species contributing major share in the benthos of mangrove ecosystem.

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