

Spatial distribution of the nematodes in the subtidal community of the Central West Coast of India with emphasis on *Terschellingia longicaudata* (Nematoda: Linhomoeidae)

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Running title: *Terschellingia longicaudata* from West Coast of India ...

Abstract

Meiofaunal nematodes are among the important components of the benthic environment. They have unusually high abundance and diversity. They are largely understudied in many parts of the world and explored very little from the Indian subcontinent, possibly due to lack of expertise. Meiofauna was investigated with emphasis on nematodes, which were the most dominant group and one species – *Terschellingia longicaudata* (De Man, 1907) – along the central west coast of India, stretching between Ratnagiri and Mangalore, during 2004. Maximum nematode diversity was found at the offshore location at the water depth of 35 m, while minimum was in the estuarine region. Nematode density was positively correlated with sediment organic matter ($r= 0.73$, $p<0.05$). Among the 94 identified nematode species, *T. longicaudata* was one of the dominant species comprising >21% of nematodes and 15% of the total meiofaunal population. The species had high abundance at the stations mostly characterized by silty sediment. *T. longicaudata* has been hypothesized to have a global distribution and the present study, for the first time, adds to the inventory of its distribution along the central west coast of India.

Keywords: Nematodes; *Terschellingia longicaudata*; distribution; subtidal; meiofauna; west coast; India.

Introduction

Meiobenthic nematodes are among the most diverse and numerically dominant metazoans in the marine habitat (Heip et al. 1982; De Ley and Blaxter 2001), with a global species estimate (Lamshead and Boucher 2003) between 10^5 and 10^8 . Despite their remarkable diversity and their potential use as indicators, nematodes are among the less studied components of meiofauna (Heip et al. 1985). Nematodes play an important role in the benthic environment by i) mechanical breakdown of the detritus, ii) excretion of limiting nutrients to bacteria, iii) producing microfilm conducive to bacterial growth and iv) bioturbating sediment around detritus (Tietjen 1980). Nematode diversity has been well documented from the Atlantic and the Pacific Ocean (Heip et al. 1985). Ingole et al. (1998; 2005; 2006); Ingole and Koslow (2005) have studied the meiofaunal communities from the deep and continental Indian Ocean but very few studies are available on the nematode community dynamics (Ndaro and Olafsson 1999; Muthumbi et al. 2004; Raes et al. 2007). Meiofauna (Coull and Chandler 1992; Kennedy and Jacoby 1999) and nematode communities (Bonger et al. 1991) have been widely used in bio-monitoring programmes to assess the benthic environmental health and many species are good pollution indicators (Heip et al. 1985).

The central west coast of India has unique physical settings and dynamic biogeochemistry, with intense seasonality due to the influence of monsoon, coastal upwelling, seasonal anoxia and phytoplankton bloom (Naqwi et al. 2000). The main objective of this study was to investigate the meiofaunal community and nematode species diversity from the central west coast of India, which has no past account in any literature dealing with nematode community distribution. The aim was also to investigate the distribution and abundance of a nematode species *Terschellingia longicaudata* from this subtidal region as it is hypothesized that *T. longicaudata* has a cosmopolitan distribution (Bhadury et al. 2005). This nematode species has gained importance due to its ability to thrive in low oxygen sediments (Sergeeva 1991) and its presence in polluted habitats (Liu et al. 2008).

Study Area

Sampling sites were located along the central west coast of India (Figure 1). In total, 18 subtidal sites were selected randomly between Ratnagiri and Mangalore (Table 1). Sampling location 1 and 2 were from the marginal region, location 3, 4 and 5 to 10 were from Zuari river

mouth, a shallow estuarine region and 11 to 18 were from the shelf region. In the north, the first two stations were taken in the deeper region (500 m). The river mouth sites (Stations 5 to 10) were in shallower depth between 7 m and 15 m. The remaining sites were in 20 to 100 m water depths. All the stations had silty/muddy type of sediments.

Materials and Methods

The sediment samples from the deeper depths were collected on board CRV *Sagar Sukti* (SASU-60) and ORV *Sagar Kanya* (SK-211). The sampling in the shallower locations, particularly the harbour area (Zuari river mouth) was done with a country craft. Sediment samples were collected with a van Veen grab (0.11 m²) and by deploying a spade box corer (147.894 cm²). Separate samples were collected for sediment chlorophyll-a, organic carbon and granulometry, and immediately preserved in deep freeze. The sediment chlorophyll-a analysis was carried out by flurometric method (Holm-Hansen et al. 1965). The organic carbon of the sediment was estimated by wet oxidation method (El Wakeel and Riley 1957). For the analysis of sediment grain size, samples were dried, weighed and sieved with 63 µm to separate the sand fraction and pipette method was employed to determine the silt and the clay fraction (Folk 1968). For meiofaunal samples, an acrylic core (4.5 cm diameter) was used to sample the top 0-5 cm sediment layer. Duplicate cores were taken from each station. All samples were immediately preserved in 5% buffered seawater formalin solution with rose bengal as stain. The samples were sieved with 500 µm mesh and then by 45 µm sieve. Material retained on the 45 µm sieve was investigated for meiofauna. Meiofauna was sorted under binocular stereoscopic microscope and mounted in glycerol for taxonomic identification. Meiofaunal identification up to group level was done using the key by Higgins and Thiel (1988) and the nematodes were identified up to the lowest possible taxa (genus/species) using pictorial key by Platt and Warwick (1983; 1988) and Warwick et al. (1998). The meiofaunal abundance was converted to nos/10cm². The Bray-Curtis similarity using untransformed meiofaunal and nematode abundance was made by the multi-dimensional scaling (MDS) ordination using PRIMER 6.0 software.

Results and Discussion

In open ocean, light penetration limits the benthic primary production in deeper water, restricting the availability of chlorophyll in the sediment. On the other hand, organic matter in

the sediment is accumulated over a time period both from the pelagic flux as well as contribution from riverine sources (Rao and Veerayya 2000; Ingole et al. 2001). In this study there was a positive correlation between sediment organic carbon and water depth ($r= 0.32$, Figure 2).

Meiofauna is an important link between the bacteria - detritus and the carnivore level (Chardy and Dauvin 1992).

Among meiofauna; nematodes, ostracodes, turbellarians, polychaetes, harpacticoid copepods, bivalves and oligochaetes were recorded from the sampling area besides hydroids, nauplii and gastropods. The group , with unidentified specimens was kept under others. The nematode density was highest at station 3 (303 nos/10cm²) and lowest at station 18 (19 nos/10cm²). Very high numbers of harpacticoid copepods were seen at station 6 (35 nos/10cm²) (Figure 3). Maximum numbers of meiofaunal groups were recorded at stations 12, 16 and 17 in the study area and the minimum were at stations 6 and 8. There was positive correlation between the sediment organic carbon and meiofaunal density ($r= 0.72$, $p<0.05$; Figure 4). Moreover, the multi-dimensional scaling ordinates for meiofauna abundance revealed no clear distinction of the habitats (Figure 5). The low densities of meiofauna differences were attributed to high hydrodynamic stress around the continental slope (Rao and Veeryya 2000) preventing phytoplankton from reaching the deeper sediments (Vanaverbeke et al. 2000). Moreover, higher current speed above the sediment increases the risk of the meiobenthos being eroded or suspended (Vanaverbeke et al. 2000). Low occurrence of meiofaunal groups and high percent dominance of nematodes suggests sensitivity of other meiofaunal groups to dynamic habitat compared to nematodes (Heip et al. 1985; Coull and Chandler 1992). Therefore, in-depth taxonomic resolution of the nematode community might give a better picture of the heterogeneous habitats.

Nematodes were found at all the stations and were the most dominant with mean abundance of 84% followed by harpacticoids and polychaetes with 5% each (Figure 3). The highest number of species (35) was found at station 12 and lowest (07) was at station 7 (Table 2). The total number of nematode species recorded from the study area was 94 (Table 2). The family Xyalidae was the most dominant and was represented by 13 out of 94 species (Table 3). The multi-dimensional scaling ordinates for nematode species abundance shows a clear

differentiation between the habitats where the estuarine stations show grouping (stations 5 to 10) and the shelf community can be seen separated (stations 11 to 18) and the deepest (500 m; stations 1 and 2) are again well separated from others (Figure 5). Cluster analysis depicts that station 3 and 4 are part of the shelf community (station 11 to 18) while a very different estuarine community (stations 5 to 10) is separated from the continental marginal (station 1 and 2) and shelf community (Figure 6). As station 3 and 4 falls in the depth range of the shelf region and share similar hydrodynamic settings, the nematodes also reveal marked similarity with the shelf community. Habitat heterogeneity clearly separates the nematode community according to the habitats and the hydrodynamics of that particular location (Schratzberger et al. 2006; Vanaverbeke et al. 2000). The most widely distributed nematode was *Desmoscolex* sp., accounted from all the stations (Table 2). The species *Polysigma* sp. was most conspicuous in occurrence in terms of abundance (126 nos/10cm²). Food source is also an important aspect for the distribution of nematode species (Moens et al. 1999). Organic matter plays an important role in structuring the nematode community (Pusceddu et al. 2009) and apparently nematode abundance shows positive correlation with sediment organic carbon ($r=0.73$, $p<0.05$; Figure 4). It may suggest the dependence of the nematode community on the bacterial biomass and the organic matter reaching the sediments (Meyer-Reil and Faubel 1980; Danovaro 1996).

The percent dominance was calculated for mean abundance of *T. longicaudata* at all the stations. *T. longicaudata* was present at 12 out of the 18 sampled locations (Table 3). The highest percent dominance was observed at station 18 (86%) and it constituted about 21% of the nematode community and 15% of the meiofauna (Figure 7).

T. longicaudata is a selective deposit feeder (Wieser 1953) mainly feeding on heterotrophic bacteria and detritus with EPS (Rezeznik-Orignac et al. 2008). It has been reported from most of the world's oceans and estuaries and was typically the dominant species in soft sediments from inshore water and is also considered as having a cosmopolitan distribution (Bhadury et al. 2005).

The presence of *T. longicaudata* in heterogeneous habitats proves its ubiquitous distribution in the marine sediments such as mangroves, mudflats (Hodda and Nicholas 1985) various subtidal habitats (Heip et al. 1985; Tita et al. 2002; Schratzberger et al. 2004; 2006; Bhadury et

al. 2005; Travizi and Vidakovic 1997) seagrass bed (Novak 1989) and lagoons (Villano and Warwick 1995). The species is also known to excel in anthropogenically disturbed and polluted habitats (Liu et al. 2008; Schratzberger and Warwick 1998; Lamshead 1986). *T. longicaudata* seems to show affinity towards silty sediment type (Tietjen 1980) and this stands true in this part of the tropical Indian Ocean (Figure 7).

Dominance of *T. longicaudata* from the intertidal regions of Eastern Australia and seagrass bed has been reported by Alongi (1990) and Fisher and Sheaves (2003) respectively. The dominance of *T. longicaudata* at most of locations might be due to few factors but the most evident is the silty sediment type.

The presence of *T. longicaudata* in most of the marine habitats indicates its adaptability to different type of sediments (Sergeeva 1991). Detailed phenotypic variation in *T. longicaudata* along with molecular evolutionary studies has already been initiated (Bhadury et al. 2005). Comparison of molecular data from various locations will probably provide direct evidence of genetic variability, if any, and be the pathway for determining worldwide distribution of this species. The present study confirms its presence from the coastal Indian Ocean and supports the notion of its ubiquity with species preference for silty sediments.

Acknowledgements

The authors thank the Director, NIO, Goa for the facilities. They would like to express their gratitude to all the cruise participants for their assistance in onboard sampling. They acknowledge the help of Dr. Melanie Austen, of Plymouth Marine Laboratory, Plymouth, UK, for confirming the nematode taxonomy through the Darwin nematode workshop and the three anonymous reviewers for providing helpful comments on the manuscript. This is the contribution no.NIO (CSIR) Goa.

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Table 1: Showing the stations and the parameters.

Station	Lat. (°N)	Long. (°E)	Depth (m)	Substrate	Gear Used	Chl (µg/g)	OC (%)
1	17 30 00	71 12 00	500	Clayey	Box corer	0.11	2.17
2	17 30 00	71 12 00	500	Clayey	Box corer	0.16	1.88
3	17 30 00	72 44 00	50	Silty sand	Box corer	0.5	1.84
4	17 30 00	72 44 00	50	Silty sand	Box corer	0.19	3.56
5	15 25 02	73 48 00	15	Silty	Van Veen Grab	0.04	0.58
6	15 25 40	73 48 17	9	Clayey	Van Veen Grab	0.02	1
7	15 25 60	73 48 40	9	Clayey	Van Veen Grab	0.02	1.55
8	15 25 00	73 48 40	8	Clayey	Van Veen Grab	0.04	0.5
9	15 24 99	73 48 63	7	Clayey	Van Veen Grab	0.03	1.96
10	15 25 04	73 48 85	7	Silty	Van Veen Grab	0.02	1.44
11	15 30 00	73 40 00	23	Silty	Van Veen Grab	0.09	0.11
12	15 30 00	73 35 00	35	Silty	Van Veen Grab	3.22	0.14
13	15 30 00	73 00 00	112	Silty sand	Van Veen Grab	2.21	0.14
14	15 00 00	73 45 00	43	Clayey	Van Veen Grab	3.22	0.06
15	14 06 00	74 18 00	32	Silty	Van Veen Grab	2.9	0.08
16	13 00 76	74 30 11	29	Silty	Van Veen Grab	3.36	0.07
17	13 00 00	74 15 00	60	Silty sand	Van Veen Grab	1.75	0.04
18	13 00 11	74 03 00	97	Silty	Van Veen Grab	2.35	0.03

Table 2: Occurrence of nematode species at the sampling stations

Genus\Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Actarjania</i> sp.	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+
<i>Aerolaimus paucisetosus</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Anoplostoma</i> sp.	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Apodontium</i> sp.	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
<i>Ascolaimus</i> sp.	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-
<i>Axonolaimus</i> sp.	-	-	+	+	-	-	+	+	-	+	+	-	-	-	-	+	+	-
<i>Bathylaimus</i> sp.	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Calligyryus</i> sp.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
<i>Calomicrolaimus</i> sp.	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-
<i>Campylaimus</i> sp.	-	-	+	+	-	-	-	-	-	-	+	+	+	-	-	+	-	-
<i>Cantholaimus</i> sp.	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	-	+	-
<i>Ceramonema</i> sp.	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetonema</i> sp.	-	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-
<i>Chromaspirina</i> sp.	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chromadorita</i> sp.	-	-	-	+	-	-	-	+	-	-	-	+	+	-	+	+	+	+
<i>Cobbia trefusaeformis</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
<i>Comesa</i> sp.	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-
<i>Daptonema</i> sp.1	+	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+

<i>Daptonema</i> sp.2	+	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	
<i>Desmodora</i> sp.	-	-	-	-	-	+	-	-	-	-	+	+	+	+	-	-	+	-
<i>Desmoscolex</i> sp.	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-
<i>Dichromadora</i> sp.	-	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	-
<i>Diplopeltoides</i> sp.	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Dorylaimopsis</i> sp.	-	-	-	-	-	+	-	-	-	-	+	-	+	+	-	+	+	+
<i>Draconema</i> sp.	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Elzalia</i> sp.	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Enoplolaimus</i> sp.	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-
<i>Epacanthion</i> sp.	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	+	-
<i>Eumorpholaimus</i> sp.	-	+	-	-	+	+	-	-	+	-	-	-	-	+	-	-	-	-
<i>Eurystomina caesiterides</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Gammanema</i> sp.	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Gnomoxyla</i> sp.	-	-	+	-	+	-	+	-	+	-	-	-	-	-	-	+	-	-
<i>Gomphionchus</i> sp.	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	+	-	-
<i>Gonionchus</i> sp.	+	+	-	-	-	-	-	-	-	-	+	+	+	+	+	-	+	+
<i>Greeffiella</i> sp.	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Halalaimus isaitshikovi</i>	-	+	+	+	-	+	-	-	+	+	+	+	+	+	+	+	+	-
<i>Halanonchus</i> sp.	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Halichoanolaimus</i> sp.	-	-	+	+	-	+	-	+	-	-	+	+	+	-	-	+	-	-
<i>Hopperia</i> sp.	-	-	-	-	+	+	-	+	-	+	+	+	+	-	-	-	-	-
<i>Latronema</i> sp.1	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Latronema</i> sp.2	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	-	-	-

<i>Leptolaimus</i> sp.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Marylynnia</i> sp.	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Megadesmolaimus</i> sp.	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
<i>Metachromadora</i> sp.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Metacyantholaimus</i> sp.	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	
<i>Metadasynemalla</i> sp.	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Metalinhomoeus</i> sp.1	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	
<i>Meyersia</i> sp.	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	
<i>Microlaimus</i> sp.	-	-	-	-	-	+	+	-	-	-	-	+	+	+	-	-	+	+
<i>Molgolaimus</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
Monhystrid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
<i>Notochaetosoma</i> sp.	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oncholaimid	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Oncholaimus</i> sp.	+	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-
<i>Onyx</i> sp.	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Oxystomina</i> sp.	-	-	+	-	-	-	-	-	-	-	+	+	+	+	-	+	+	+
<i>Paracomesoma</i> sp.	-	-	-	-	-	-	-	-	-	+	+	+	-	+	+	+	-	-
<i>Paralinhomoeus</i> sp.	-	+	-	+	-	-	-	-	-	-	+	+	+	+	+	+	+	+
<i>Paralongiciantholaimus</i> sp.	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	+	-	-
<i>Paramesonchium</i> sp.	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
<i>Paramicrolaimus</i> sp.	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Paramonhystera</i> sp.	+	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-

<i>Pierrikia</i> sp.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Polysigma</i> sp.	+	+	+	+	-	+	-	-	+	-	+	+	+	+	-	-	+	-
<i>Promonhystera</i> sp.	-	+	+	-	+	-	-	-	-	-	+	+	+	+	-	+	+	+
<i>Pselionema</i> sp.	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-	+	+	-
<i>Quadricoma</i> sp.	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	+	-
<i>Rhabditis</i> sp.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Rhabdocoma</i> sp.	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Sabatieria</i> sp.	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	-	-	+
Sclachinematidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
<i>Siphonolaimus</i> sp.	-	-	-	-	+	+	-	+	+	+	-	-	-	+	-	+	+	-
<i>Sphaerolaimus</i> sp.	-	-	+	+	-	-	-	-	+	-	+	+	+	+	+	+	-	-
<i>Spirinia</i> sp.	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Spirobolbolaimus</i> sp.	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-
<i>Steineria</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
<i>Subsphaerolaimus</i> sp.	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-
<i>Tarvaia</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
<i>Terschellingia</i> sp.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
<i>Terschellingia</i> <i>longicaudata</i>	-	-	+	+	+	+	-	-	+	+	+	+	-	-	+	+	+	+
<i>Terschellingia</i> sp.	-	+	+	+	-	-	-	-	-	-	+	-	+	+	+	+	+	-
<i>Theristus</i> sp.	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	-	-	+
<i>Theristus</i> sp.2	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoma</i> sp.	-	-	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-

<i>Trissonchulus</i> sp.	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Vasostoma</i> sp.	-	-	+	-	-	-	-	-	-	-	+	+	+	-	+	-	+	+
<i>Viscosia abyssorum</i>	-	-	-	+	-	-	-	+	+	-	+	-	-	-	-	-	-	-
Unidentified	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Total No. of species	20	25	30	26	10	19	7	12	13	15	32	35	34	33	20	25	29	16

Table 3: Details of nematode family and genera and percent occurrence and prevalence of *T. longicaudata* at various stations

Station. No	Nematode			<i>T. longicaudata</i>	
	Families	Genera	Species	Occurrence	% Abundance
1	14	20	20	-	0
2	17	25	25	-	0
3	16	30	30	+	9
4	16	26	26	+	5
5	6	9	10	+	37
6	11	18	19	+	8
7	7	7	7	-	0
8	9	11	12	-	0
9	10	12	13	+	5
10	8	14	15	+	54
11	17	32	32	+	60
12	17	35	35	+	13
13	17	34	34	-	0
14	17	33	33	-	0
15	12	20	20	+	29
16	15	25	25	+	57
17	17	29	29	+	7
18	8	16	16	+	86
Mean	13	22	22	-/+	21

Figure legends

Figure 1: Showing station locations marked by numbers in the study area.

Figure 2: Correlation of water depth with the sediment chlorophyll-a ($\mu\text{g/g}$) and sediment organic carbon (%).

Figure 3: Abundance ($\text{nos}/10\text{cm}^{-2}$) of meiofaunal taxa at each station location

Figure 4: Correlation of meiofaunal and nematode density with sediment chlorophyll-a ($\mu\text{g/g}$) and sediment organic carbon (%).

Figure 5: Multi-Dimensional Scaling (MDS) ordination for untransformed meiofaunal (a) and nematode (b) abundance on a two dimensional scale at each station location.

Figure 6: Bray-Curtis similarity Cluster analysis based on nematode species abundance at each station location.

Figure 7: Total percentage of *T. longicaudata* in nematodes and meiofauna (*- Stations with silty type of sediment).

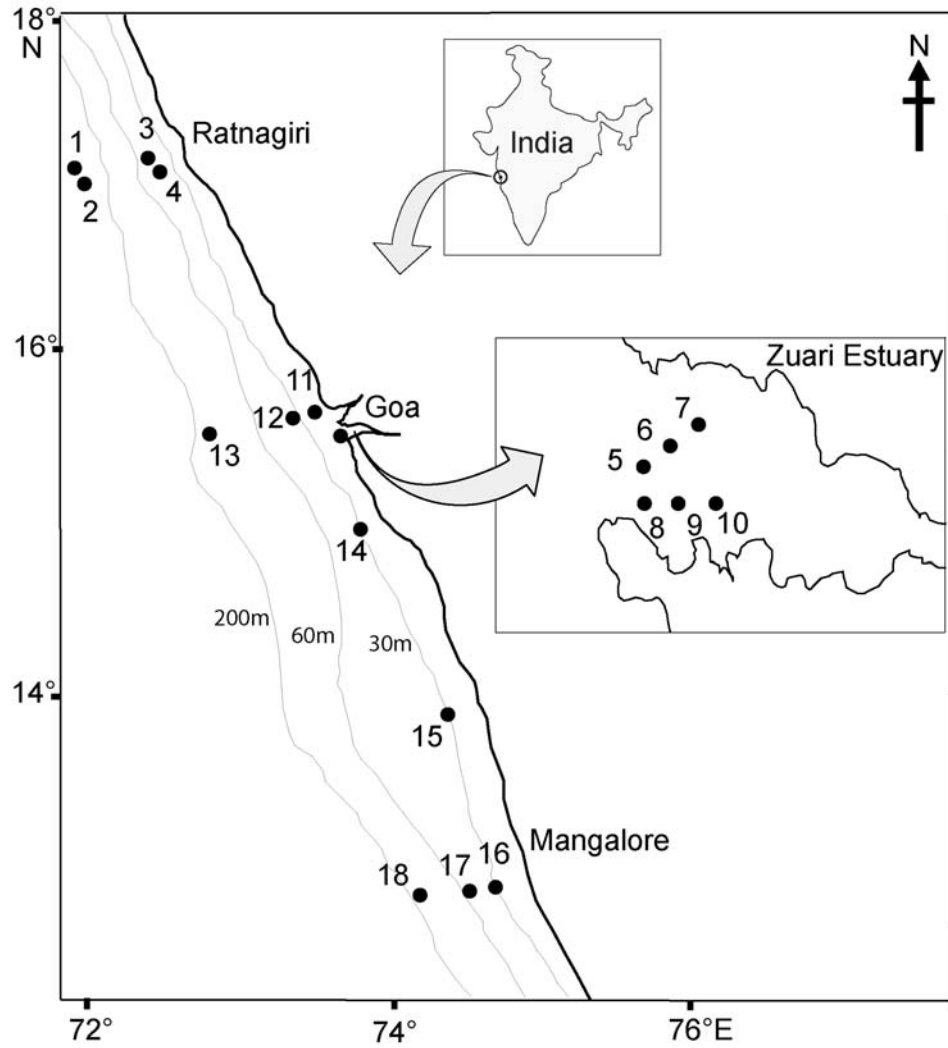


Figure 1

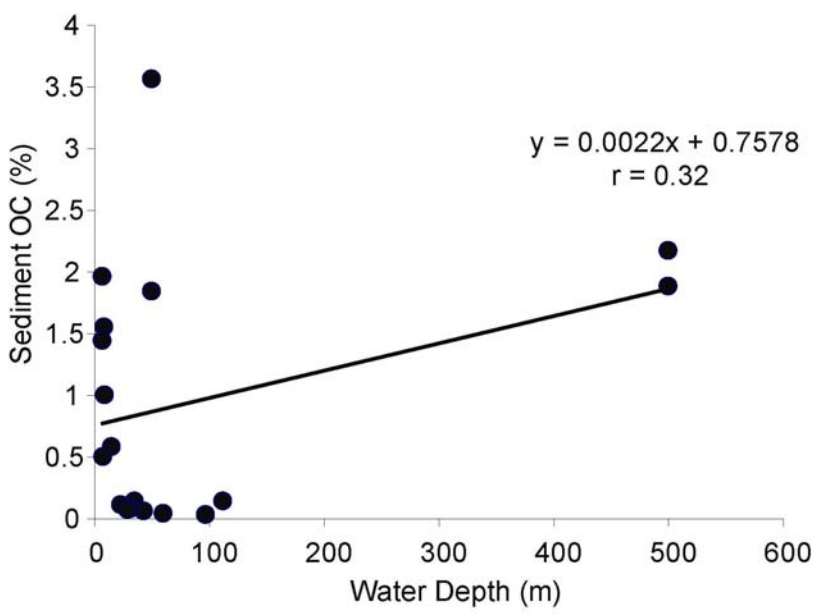
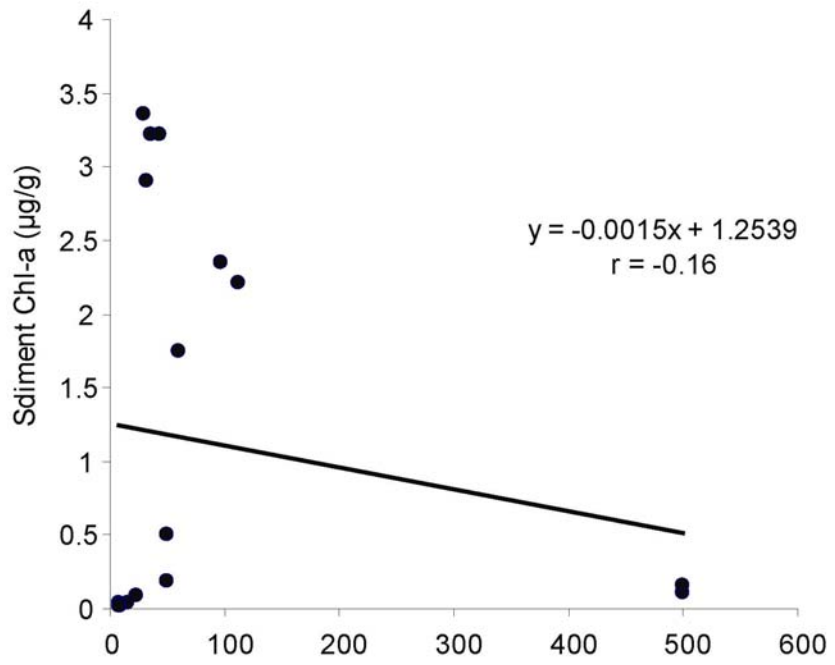


Fig 2

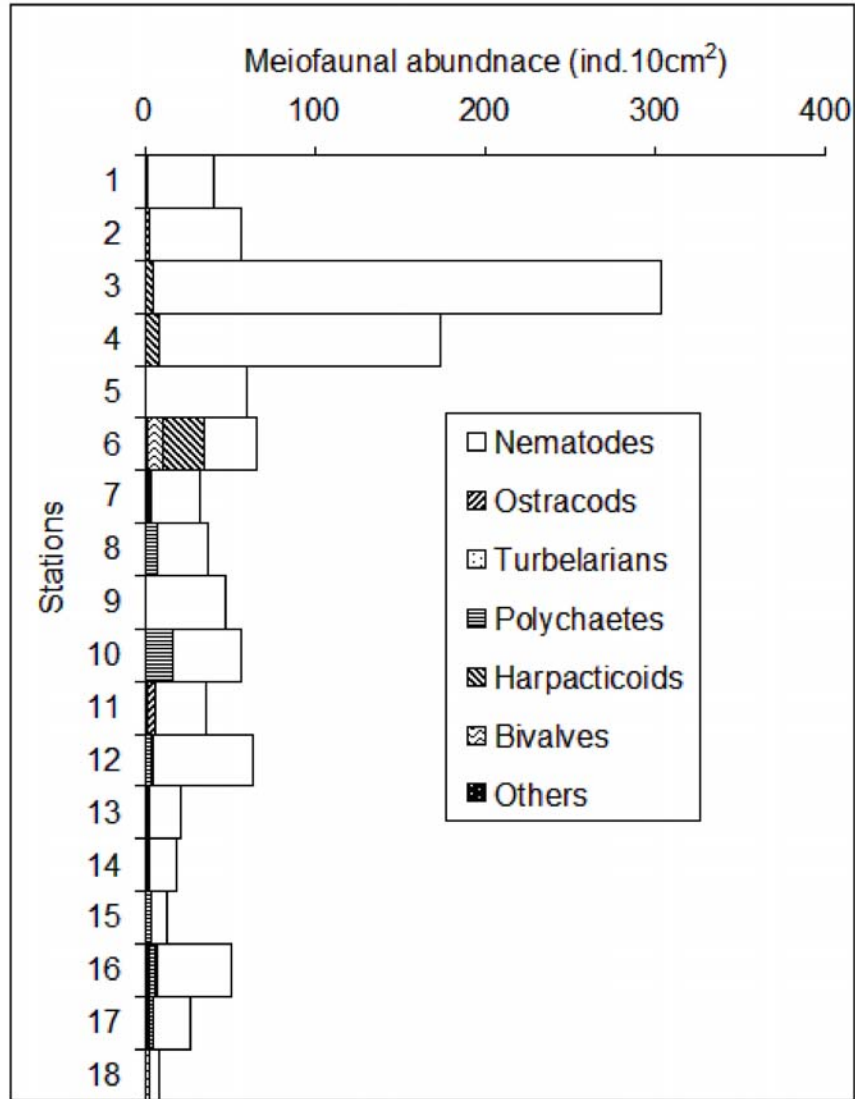


Figure 3

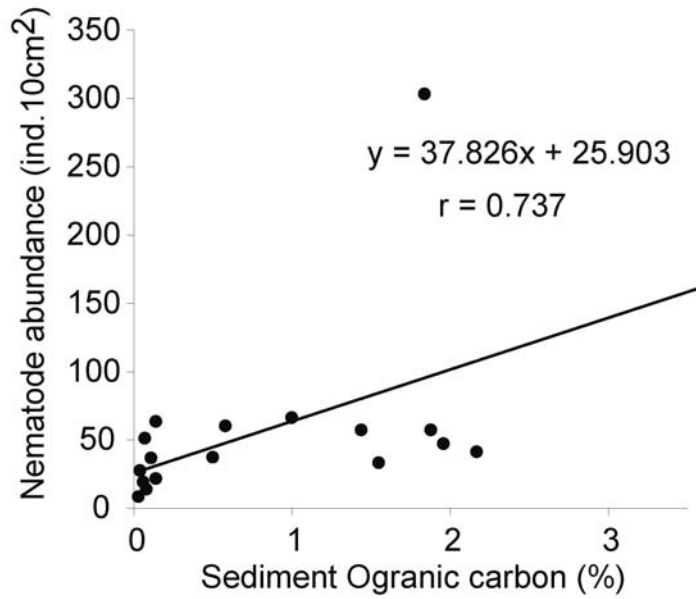
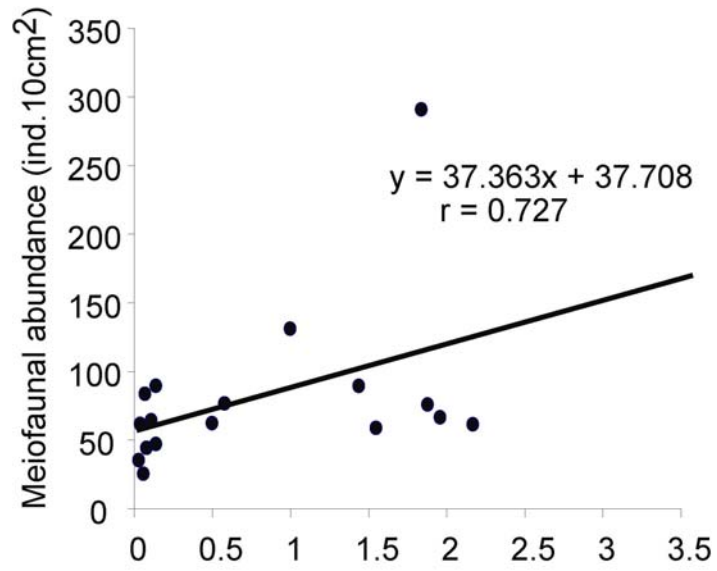


Figure 4

Resemblance: S17 Bray Curtis similarity

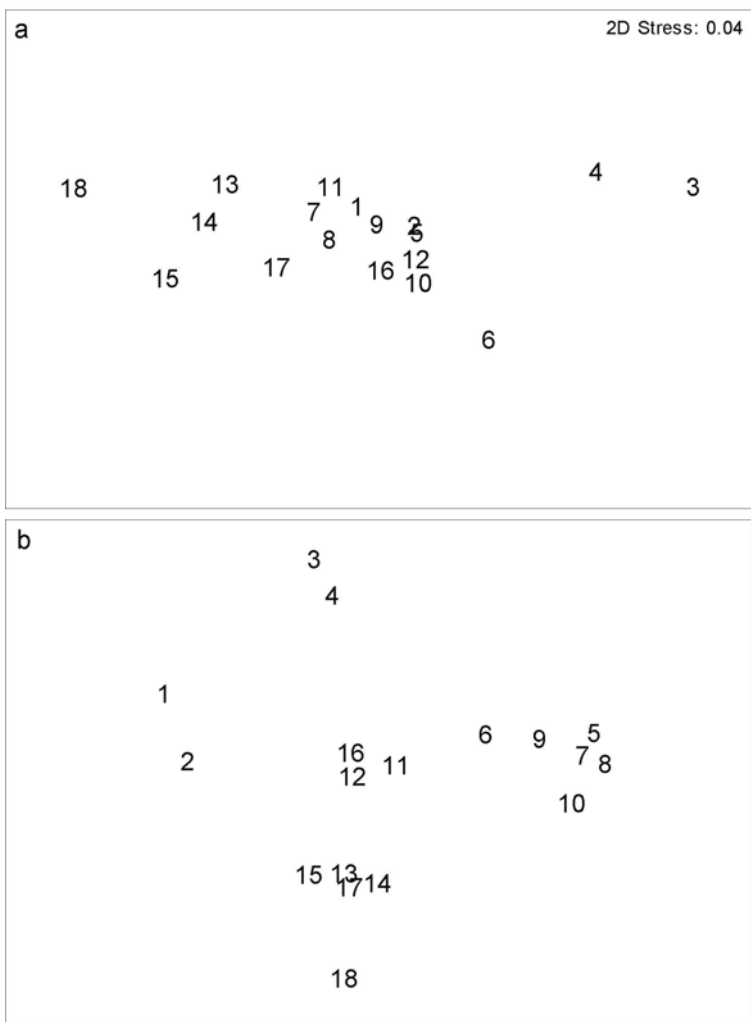


Fig 5

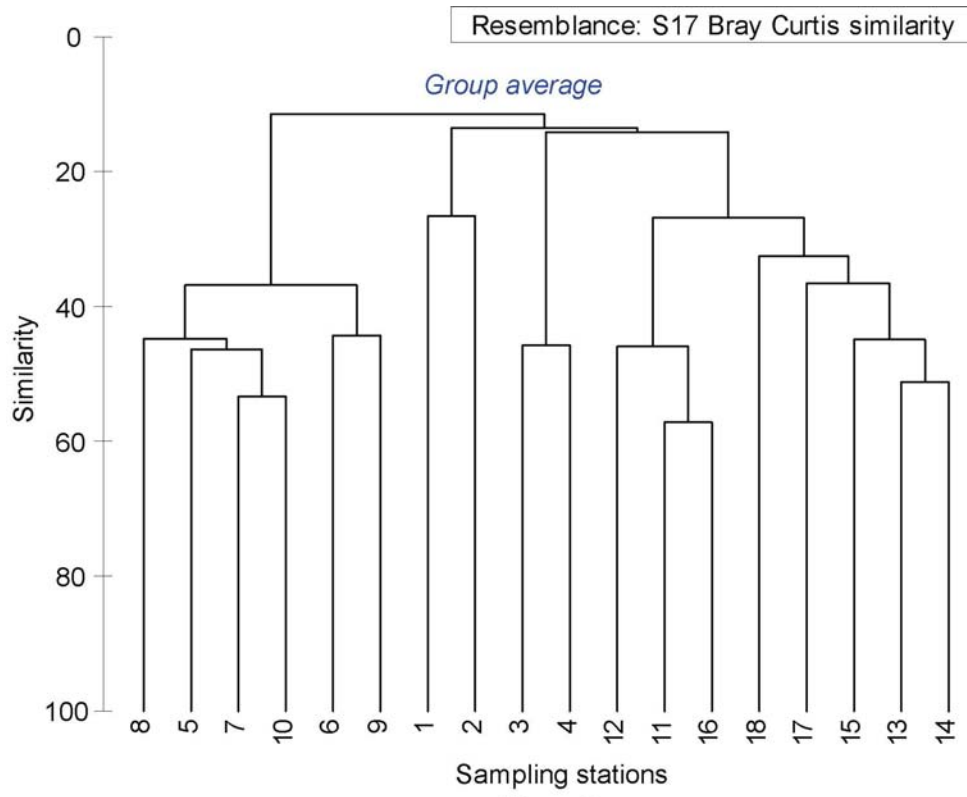


Figure 6

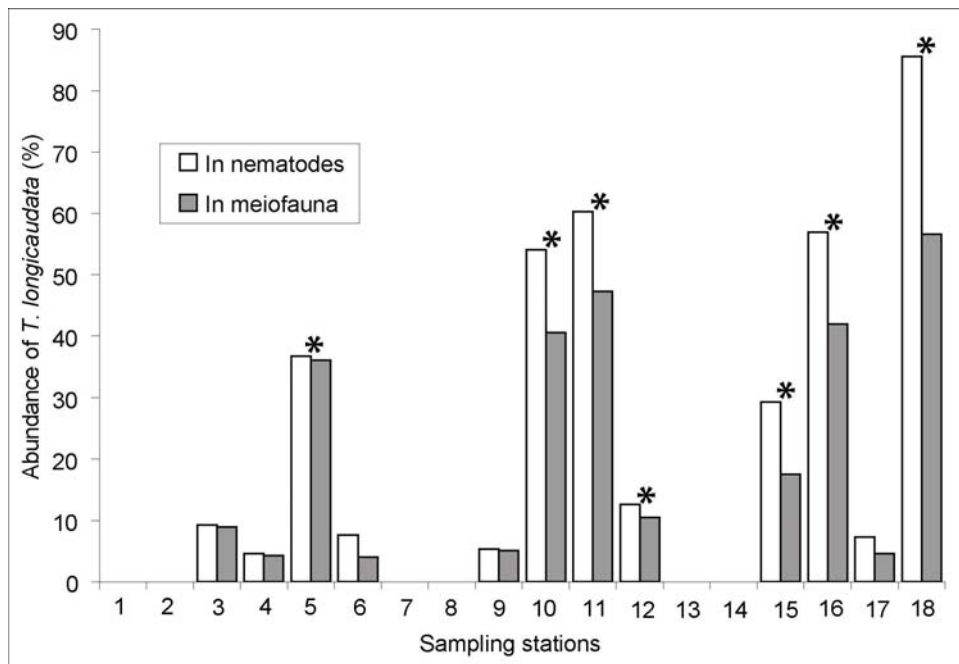


Fig 7