

Benthic polychaetes off Edward VIII Plateau in the continental shelf of East Antarctica

¹Usha V. Parameswaran, ¹Abdul Jaleel K. U., ¹Sanjeevan V. N., ²Antony P. J. and ³Elizabeth John

¹Centre for Marine Living Resources & Ecology, Ministry of Earth Sciences, Block C, 6th Floor, Kakkanad, Kochi 682 037, India

²Department of Zoology, St. Michael's College, Cherthala, Alappuzha 688 539, India

³Protein Engineering Lab, Molecular Biology Division, Pusan National University, 30 Jangjeon-dong, Geumjeong-gu, Busan 609 735, South Korea

[E- Mail:ushaparam25@gmail.com.]

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Samples of marine benthos were collected from three stations (200-300 m depth) off the Edward VIII Plateau (Enderby Land, East Antarctica) during the Third Indian Expedition to the Southern Ocean (2009). Dominant taxonomic groups collected were the polychaetes (165 individuals), nematodes (71) and crustaceans (83), along with echinoderms (19), bivalve molluscs (18), mast pycnogonids (4) and bryozoans. Among the polychaetes, 53 species could be identified. Syllids were represented by the most number of individuals (18.5%), followed by the paraonids (13.1%), spionids (12.5%) and cirratulids (11.9%). Most abundant species collected were *Brania* sp. (Syllidae) and *Laonice weddellia* (Spionidae). The polychaete species represented in the samples are listed.

[**Keywords:** Antarctica, Benthos, Polychaetes, Continental shelf]

The benthic fauna of the shelf off East Antarctica is relatively unexplored, when compared to regions like the West Antarctic Peninsula and Ross Sea¹. The continental shelf of Antarctica is unusually deep (average depth 450 m) and in some places as wide as 125 km². Though this shelf covers a vast area (nearly 11.4% of the world continental shelf area), baseline information on species occurrence in this region was very poor until recently¹. Under the auspices of the Census of Antarctic Marine Life (CAML), International Polar Year (IPY) and the Scientific Committee on Antarctic Research Marine Biodiversity Information Network (SCAR-MarBIN), taxonomic lists of species recorded in the Southern Ocean have been compiled to form the Register of Antarctic Marine Species (RAMS), which currently includes over 1.02 million records of 10,042 species³. Among the marine benthos, over 4100 species have been described from the Antarctic continental shelf alone^{2,4,5}. Availability of datasets from such databases

has enabled several attempts to define the biogeography of the Antarctic shelf. A zoogeographic zonation based on peracarid crustaceans revealed that the East Antarctic region harbours highest species richness for this group⁶. Based on richness of gastropod and bivalve molluscs, Linse *et al.*⁷ and Clarke *et al.*⁸ were able to subdivide this wide region (0°-170° E) into three sub regions, viz. Dronning Maud Land (0°-45°E), Enderby Land (45°E-55°E) and Wilkes Land (55°E-170°E). An unusually high richness of molluscs has been reported from off Enderby Land⁷.

Polychaetes represent an important component of the benthic community, in terms of abundance, species richness and diversity in the Antarctic, as in other parts of the world ocean^{9,10}. Although polychaete species of the Southern Ocean have been described since late 19th Century, most of the knowledge about taxonomy and distribution of polychaetes in this region comes from the more comprehensive works such as those of Hartman¹¹⁻¹⁴ and Hartmann-Schroeder

& Rosenfeldt^{15,16}. More recently, detailed studies have been carried out on polychaete diversity and ecology in smaller geographic regions, like the Magellan region^{17,18} and the Ross Sea¹⁹⁻²⁵. Descriptive and revisional works on selected orders and families have also been published²⁶⁻²⁸ and new taxa continue to be discovered in the Antarctic & Sub-Antarctic regions^{25, 27,29-33}. Currently, 548 valid polychaete species are listed in the RAMS³.

During the Third Indian Expedition to the Southern Ocean (February-May, 2009) benthic infauna were collected from three sites (detailed in Table 1 & Fig. 1) on the continental shelf off the north of the Edward VIII plateau (Enderby Land, East Antarctica), at depths between 200-300 m, on board

Akademik Boris Petrov. Sampling was carried out on 5th March, 2009. A Van-Veen Grab (0.7 m² area) was operated at the 3 sites and the samples were sieved on-board through a 500µ mesh sieve, before preservation in 7% formaldehyde containing Rose Bengal stain. In the shore lab, the samples were sorted to groups, and the polychaetes were then identified using the keys of Fauchald³⁴ and relevant taxonomic papers. The sediment texture of the samples was analyzed using a Sympatec Particle Size Analyzer.

The near-bottom water temperature recorded during the collection was -1.4°C and the near bottom salinity was 34.33. Anchored ice and icebergs were observed around the area. Sediment texture analysis revealed that the sediment was sandy (93.4% sand). Small stones along with biogenic components (bryozoan hash, foraminifer shells, sponge spicules etc.) were also present.

Polychaetes were the numerically dominant group in the samples, contributing 46% of the total abundance. Other groups represented were nematodes (>500µ), crustaceans, echinoderms, molluscs, pycnogonids and bryozoans (Figure 2). A total of 165

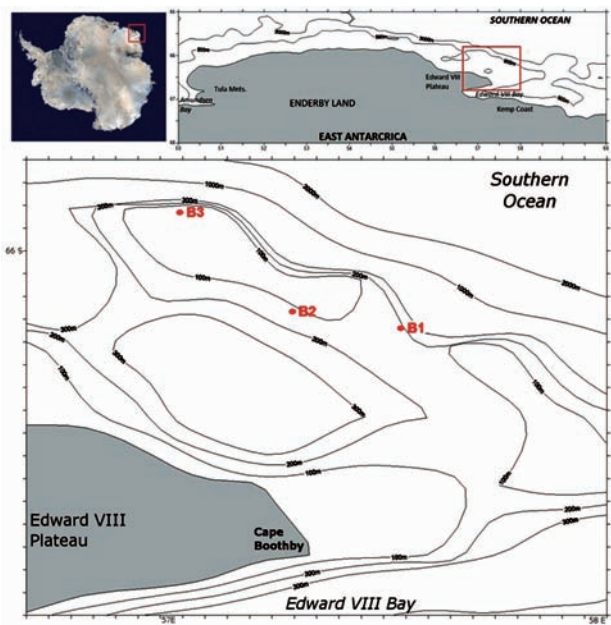


Fig. 1—Study area and station locations

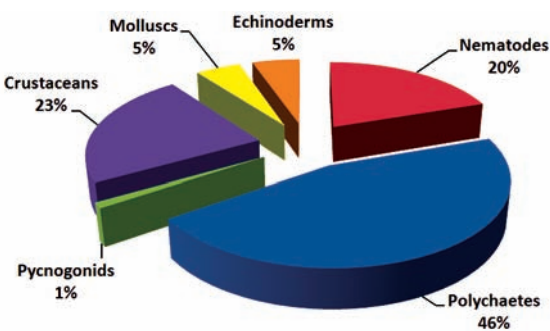


Fig. 2—Group-wise composition of macrobenthos

Table 1—Station Locations & Sampling time

Station	Date	Time (hrs)	Latitude	Longitude	Depth
B1	5/3/2009	1145	66° 10.176' S	57° 32.342' E	394.7 m
B2	5/3/2009	1500	66° 07.991' S	57° 17.723' E	203.5 m
B3	5/3/2009	1820	65° 54.939' S	57° 02.647' E	281.0 m

Table 2—List of polychaete taxa

	B1	B2	B3		B1	B2	B3
				<i>Aricidea suecica</i>		+	+
Amphinomidae				<i>Aricidea sp.</i>	+	+	
Amphinomid sp.		+		<i>Levisenia sp. 1</i>			+
Phyllodocidae				<i>Levisenia sp. 2</i>	+		
<i>Phyllodoce sp.</i>	+			Paraonid spp.	+	+	+
Phyllodocid sp.		+		Opheliidae			
Syllidae				<i>Ophelina cylindrica</i>	+	+	
<i>Brania sp.</i>		+		<i>Ophelina sp.</i>	+	+	
Eusyllid sp.		+	+	<i>Travisia antarctica</i>		+	
Glyceridae				Opheliid spp.	+	+	
<i>Glycera capitata</i>	+	+		Capitellidae			
<i>Glycera sp.</i>			+	<i>Capitella capitata</i>	+		
Lacydonidae				<i>Notomastus laticerus</i>			+
<i>Lacydonia antarctica</i>	+			Maldanidae			
Dorvilleidae				<i>Notoproctus oculatus</i>	+		
Dorvilleid sp.	+			<i>Maldane sarsi</i>			+
Lumbrineridae				<i>Maldanella sp.</i>	+		+
<i>Lumbrineris coccinea</i>		+		<i>Rhodine sp.</i>		+	
Spionidae				Maldanid sp. 1			+
<i>Laonice weddellia</i>	+	+	+	Maldanid sp. 2	+		
<i>Spiophanes soederstomi</i>			+	Oweniidae			
<i>Spiophanes tcherniai</i>	+	+		<i>Myriochele sp.</i>		+	
<i>Prionospio sp. 1</i>			+	Ampharetidae			
<i>Prionospio sp. 2</i>		+		<i>Amphicteis gunneri</i>		+	
Cirratulidae				<i>Ampharete sp.</i>		+	
<i>Chaetozone pinguis</i>		+		Ampharetid sp. 1		+	
<i>Tharyx marioni</i>	+			Ampharetid sp. 2		+	
<i>Cirratulus sp.</i>		+		Terebellidae			
Cirratulid sp.	+			<i>Amphitrite cirrata</i>		+	
Flabelligeridae				Trichobranchidae			
<i>Flabelligera sp.</i>		+		Trichobranchid sp. 1		+	
Chaetopteridae				Trichobranchid sp. 2	+		
Cahaetopterid sp. 1	+			Sabellidae			
Cahaetopterid sp. 2	+			<i>Potamilla antarctica</i>			+
Orbiniidae				<i>Chone sp.</i>	+		
<i>Haploscoloplos kerguelensis</i>		+	+	<i>Euchone sp.</i>		+	+
<i>Orbiniella drakei</i>	+			<i>Jasmineira sp. 1</i>		+	+
Paraonidae				<i>Jasmineira sp. 2</i>			+
				Sabellid sp.		+	

polychaetes falling under 53 species from 21 families were represented (Table 2). Of these, 20 were identified up to species level and 19 to generic level. Attribution of the remaining 16 taxa beyond family level was not possible due to irreversible damage sustained by the specimen. Syllidae (represented by 31 individuals belonging to 4 species) along with Spionidae (22 individuals, 5 species), Paraonidae (22 individuals, 4 species), Cirratulidae (19 individuals, 4 species), Maldanidae (8 individuals, 6 species) and Sabellidae (10 individuals, 5 species) were the important families among the polychaetes. The most abundant species collected were *Brania* sp. (27 individuals), along with *Laonice weddellia* (14 individuals), an unidentified trichobranchid (12), an unidentified paraneid (9) and *Chaetozone setosa* (8); amongst these *Laonice weddellia* and the paraneid species were represented in all three stations, while *Brania* sp., *Chaetozone setosa* and trichobranchid species were represented only in Station B2. Species numbers was highest in Station B2 (species count, $s=29$, Margalef's richness, $d=6.08$) while higher diversity (Shannon-Weiner Index, $H' \log_2 = 4.22$) was obtained in station B1. The majority of polychaetes in the samples were surface and sub-surface deposit feeders (66%), while carnivores (25.6%) and suspension feeders (8.4%) were also represented.

High species richness has been reported in the continental shelf of East Antarctica in the case of molluscs and peracarid crustaceans⁶⁻⁸. Relatively high species diversity of polychaetes was revealed off Enderby Land in the present study, despite the limited observations. The species records in the present study are important since there are no previous records of benthic polychaetes from this region, and the data presented herein can be used for detailed analysis of polychaete biogeography in a large spatial scale.

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