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Short Communication

Tsunami and marine biodiversity concerns

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Absract

Two species of bryozoans hitherto recorded only from the benthic region of the Indian seas were collected from the coast of Kanyakumari [08°30'01" N lat. 77°50'68" E long.], 2030 km away from the point of origin of the tsunami waves. Bioinvasion of animals has been recognised in marine biota due to natural and anthropogenic factors. The bryozoan species *Hippopetraliella magna* (D' Orbigny, 1852) and *Triphyllozoon philippinense* (Busk, 1884), collected from the coast of Kanyakumari indicate undisruptive bioinvasion.

Biodiversity is an integral part of marine biogeography. Phylum Bryozoa, comprising of around 6000 living species and 22,000 fossil species is one of the oldest groups of marine invertebrates to colonize the world oceans. The classical work of Harmer (1934, 1957) has shown faunistic similarities between bryozoans of the Indian and Pacific oceans. Curiously enough the Indo-Australian archipelago, a well-known earth quake prone chain of islands has many common bryozoan inhabitants from the southwest Pacific and southeast Indian Ocean. The paleontological history of bryozoans dates back to the Paleozoic era. Characteristically capable of maintaining very stable external and internal morphology, the species of this phylum enjoy geological distribution from the Ordovician to the Recent.

An undersea earthquake in the bed of Indian Ocean with an intensity of 9.0 on the Richter's scale generated a tsunami that struck the coasts of India on 26th December 2004. The earthquake triggered tsunami waves travelled from Sumatra to the Indian Ocean striking both the Bay of Bengal and the Arabian Sea. Tsunami can influence the pattern of distribution of marine benthic animals since this phenomenon results in the transport of enormous quantities of seawater, sweeping through the continental slope and shelf. The resulted environmental hazards are short lived; though the physical and biological effects due to the perturbation can last for several weeks. Investigations on the sediment characteristics of Nagapattinam, a tsunami affected area in the east coast of India revealed predominantly dark and coarse sediments with extraordinary high content of metallic salts and phosphates (Sujatha, 2007). It is known that the changes that occurred in the faunistic characteristics, especially of the benthos due to tsunami could be relevant signatures of massive water and sediment transport. The abyssal plain to the south of Bay of Bengal is the flattest large area of the earth surface (Ingole and Koslow, 2005). The transportation of water mass with the sediment was at a speed of 800 km/hr from the Sumatra across the southern Indian Ocean to the Bay of Bengal (*http://earthsci.org/geopro/tsunami/tsunami.html*; Anon., 2005). The debris deposited in the subtidal areas of Kanyakumari included mashed exoskeleton of two species *viz*. *Hippopetraliella magna* (D'Orbigny, 1852) and *Triphyllozoon philippinense* (Busk, 1884), transported from greater depths. Bryozoans are very common inhabitants of live coral reefs and the tsunami waves swept through one of the most biodiverse coral reef regions of the tropical world oceans (Groombridge and Jenkins, 2002; Keesing

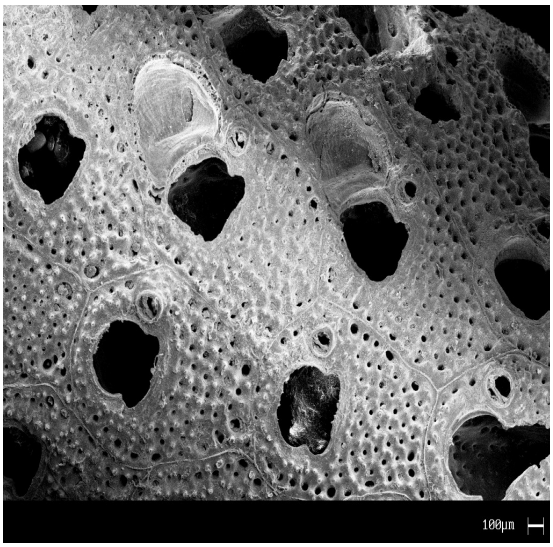
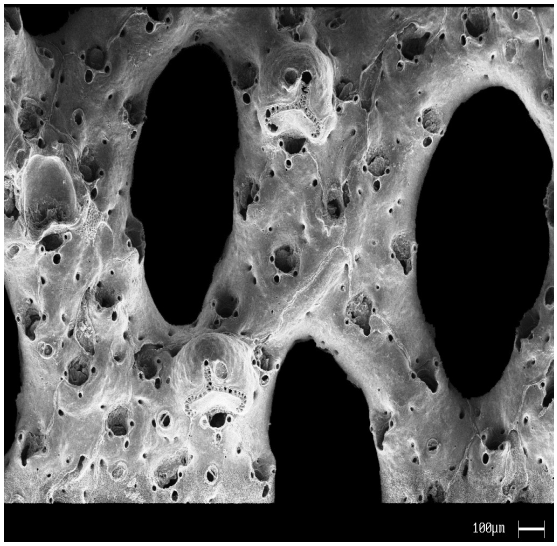


Fig. 1a. *Hippopetraliella magna,* a tubular species (SEM)



b. *Triphyllozoon philippinense,* a fenestrated species (SEM)

and Irvine, 2005). The two species of bryozoans collected from the coast of Kanyakumari are colonial animals morphologically akin to coral reefs. It is interesting to note that bryozoans being eurybathic and stenohaline probably can colonize localities away from their usual place of occurrence.

These coralline colonies are very brittle and are often broken by the force of waves. These tubular, foliaceous and highly calcified coral reef dwellers are important indicators of oceanic perturbations. Both the species recorded are inhabitants of Philippines and the Sulu Archipelago (Harmer, 1934, 1957). *H. magna* is a native of the Indian Ocean having large hemescharan zoarium. *T. philippinense* form large coralline structure by anastomoses of tubular branches. Scanning electron micrographs of the two pieces collected from the coast of Tamilnadu are presented here to give a general impression of the coralline nature of the colonies (Fig. 1a, b). The exoskeletal cases of these animals found in the subtidal area of Kanyakumari suggest possible colonization of the region by these otherwise benthic species. *H. magna* inhabits the Arctic also and is known to descend to greater depths as it approaches the equator (Canu and Bassler, 1929). The present finding is a clear indication of episodic change in the endemic distribution of these species. These species have not so far been cited in the EEZ of India (Menon and Menon, 2006). Natural upheavals are probably the causative factors for the introduction of exotic species in geographically alien localities. The faunal changes at many instances are related to transgressions and regressions of sea level (Ross and Ross, 1996). The highly calcified exoskeletal cases and well-preserved microstructure sufficiently substantiate the presence of this phyletic group in geological formations world over. The strategraphic value of these species and its applications to economic problems in ecology demands further scientific attention.

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