

A note on the biogenic honeycomb like reef structures by Sandcastle worms



Fig.1. *Sabellaria alveolata* Dorsal view

Unusual honeycomb-like structures were observed along Majali Beach (Karnataka) and Talpona Beach (Goa) during field visits in the month of January 2026. The formations were identified as biogenic reefs constructed by sandcastle worms, commonly referred to as honeycomb worms (family Sabellariidae). These reef-like structures represent a remarkable example of ecosystem engineering in the intertidal zone, where small invertebrates significantly modify their physical environment. The Majali Beach, Karnataka (14°53'53.9"N 74°05'44.4"E) is an exposed sandy beach influenced by strong wave action and abundant sediment supply. Talpona Beach, Goa (14°58'25.1"N 74°02'35.5"E) is a relatively undisturbed beach with a mix of sandy substrate and scattered hard surfaces suitable for organism

attachment. Both sites fall within the intertidal to shallow subtidal zone, providing ideal conditions for reef-building organisms due to the availability of suspended sand particles and firm anchoring substrates.

The observed structures appeared as tightly packed, hexagon-like tubular formations, and extended over several meters in length in certain areas. Each visible cell represented an individual tube constructed by a single worm. The reefs were composed of sand grains and shell fragments, bonded together using a protein-based bio-adhesive secreted by the worms. The coloration of the structures varied from pale brown to grey, reflecting the local sediment composition of each beach. Notably, these reef structures were recent formations, as no such features

had been documented during earlier visits, suggesting a possible recent colonization or environmental shift favouring reef development.

The colonies of sandcastle worms (*Sabellaria alveolata*) where each polychaete worm constructs its own tube and the close proximity of individuals results in a collective reef-like structure that provide protection and survival for the colony is remarkable. When submerged by the tide, the worms extend feathery tentacles to filter feed of floating particles of plankton and detritus from the water column. The worms can seal the entrance of their tubes with a shield-like operculum when the tide is out, trapping seawater inside to prevent dehydration. These honeycomb reefs also function as microhabitats and biodiversity hotspots that supports various



Fig. 2. Colonies of sandcastle worms

associated organisms, including small crabs, bivalves, sponges, molluscs, juvenile fish and other invertebrate marine organisms. By transforming loose sandy environments into structured habitats, sandcastle worms act as ecosystem engineers, enhancing local biodiversity and stabilizing sediments. The recent appearance

of these reefs at Majali and Talpona beaches may indicate changes in sediment availability, wave dynamics, or larval recruitment patterns. Such biogenic structures play a crucial role in coastal ecosystems, yet they are often overlooked due to their cryptic nature. Their presence highlights the dynamic and responsive nature of intertidal ecosystems, where even

small organisms can create large-scale ecological impacts.

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