



Roles for worms in reef-building

Colonial sabellariid polychaete worms form mound-like and tabular aggregations, in some cases distinct reefs, throughout the temperate and tropical oceans (see Caline et al. in Kirtley 1992). These constructions usually occur in the near-shore surf zone, where there is an abundant supply of unconsolidated sand-sized sediments, vigorous wave action and strong tidal currents. Sabellariid worms such as these pictured here commonly form structures up to 5 m in maximum dimension on the intertidal reef flat of the Bay of Wrecks on the east side of the Kiritimati atoll (central Pacific, due south of Hawaii at 2° N). These worms construct rigid sand tubes by producing minor amounts of mucroprotein cement, and use elongate,

flattened shell fragments to construct a characteristic "hood" or "porch" at the orifice of each tube (see photos). Because many sabellariids are restricted to intertidal and subtidal habitats, they have the potential to be sensitive sea level indicators. Sabellariids can be very efficient at retaining suspended sediment, impounding as much as 96 % of the sediment that washes over them. In such places, they may be important in beach-sand stabilization.

Today, Sabellariid reefs flourish best where vigorous wave- and current-action cause the suspension and transport of sand-size particles (Kirtley 1994). In some areas (e.g. east and northeast Brazil and southwest India), sabellariid reefs may extend laterally for thousands of kilometers along the shores of modern seas. Sabellariids have rarely been recognized as extensive reef builders in the geological past. Two exceptions might be the Devonian (≈ 380 my ago) of north Germany and the Miocene (≈ 6 my ago) of the Betic Cordillera of Spain (refs. in Kirtley 1994). Some fossil tube structures, such as some representatives of the trace fossil *Skolithus*, strongly resemble tube structures produced by modern sabellariids (Eckdale and Lewis 1993). Recognizable sabellariid tube fossils have been reported from the Quaternary in Chile, Baja California and the deep (≈ 2000 – 3500 m) floor of the eastern Mediterranean; the Cretaceous (≈ 80 my ago) from northern France; and the Pennsylvanian (≈ 300 my ago) from Oklahoma (refs. in Kirtley 1994). We encourage future workers to search for fossil sabellariid reefs concentrating on areas of high sedimentation in both tropical and temperate regions.

References

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Reef sites

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