



SABELLARIA FROM LARVAE TO REEF: GROWTH, ECOLOGICAL STATUS AND HABITAT MAPPING

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Worms of the family Sabellariidae are bioengineer polychaetes worldwide distributed able to build reefs on sandflats and rocks and the species *Sabellaria alveolata* (Linnaeus, 1767) and *S. spinulosa* (Leuckart, 1849) are widespread in the Mediterranean Sea. Reefs are hard compact infralittoral bioconstructions erected on solid or soft bottoms which increases volume, complexity and heterogeneity of the earlier habitat, therefore shaping the seascape. These reefs result from the aggregation of thousands of worm tubes made up of sand grains and bioclasts agglutinated with mucous.

The development of such reefs is assisted by the settlement behaviour of *Sabellaria* larvae, which settle mainly in areas of suitable sediment on existing *Sabellaria* reefs or on their dead remains.

Extended *S. alveolata* and *S. spinulosa* reefs are widespread along Atlantic and North Sea coasts of Britain and France, where they are widely studied and protected. Despite its ecological role, little is known about Mediterranean *Sabellaria* reefs along Italian coasts.

During my PhD research project, some *Sabellaria* reefs, occurring at different sites in the Tyrrhenian Sea along Latium coasts, were studied in order to: a) certify the occurrence of *Sabellaria* reefs and to map their extension; b) evaluate their ecological and conservation status; c) investigate on larval dispersal and connectivity.

In order to reach the first aim, two different approaches were employed: remote methodologies, using techniques of aerial photography, and direct observations, by means of digital and video underwater cameras. The data collected during the different survey phases were used to draw georeferenced maps. The main physiographic and hydrodynamic features of the coastal areas where the reefs occur were recorded and the data analysed by multivariate techniques, in order to stress the possible drivers for the distribution of the *Sabellaria* reefs.

For the second aim, the assessment of the conservation status of *Sabellaria* reefs were investigated, according to the literature recommended methods, inspecting both physical characteristics (such as tubes diameter and their orientation, morphology of tube mouth, thickness of the reef) and biological traits (*e.g.* worms' density, sexual maturity, presence of epibionts, abundance and composition of associated fauna).

For the third purpose, the larval supply was object of investigation, considering that *Sabellaria* reef development and dynamics are mostly controlled by dispersal via sexual propagules and larvae. Monthly plankton samplings were carrying out in order to survey the larval peaks and to define the recruitment phase during the life cycle of *S. alveolata*. In addition, a multidisciplinary approach was used to reach this aim, the influence of hydrodynamic processes on coastal larval transport was investigated in order to evaluate the possible connectivity between separate reefs and to study the role of the larval dispersal in explaining the local recruitment of the reefs scattered along the Latium coast.