

Spatial structure of several epibenthic assemblages in the White Sea

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Summary

Benthic communities that develop on hard substrata mainly consist of sessile species. Their adult stages spend the whole life being attached to the surface of a stone, shell or another epibiont's body. It was already shown that the successful existence of the sessile organisms often strongly depends on the way they interact with their neighbours. Probably those interactions may result in specific spatial distribution of epibionts. The main goal of this work was to show the regularity of the epibiosis spatial structure and to discuss the genesis of that regularity. There are three main aspects of the spatial structure the regularity may express in: substrate preferences, location preferences and orientation preferences. Three simple epibenthic systems are analysed each study stressing one of the mentioned aspects.

Substrate preferences were studied on solitary kamptozoans *Loxosomella nordgardi*. It was shown that the most preferable substrata for that species are living bryozoan colonies. *Loxosomella* seem to occupy predominantly colonies of those bryozoan species which possess relatively large polypide tentacle crowns. Observations on living kamptozoans demonstrated that they use water currents generated by bryozoan host in their feeding activity. This fact is used to explain the nature of this substrate preference.

The distribution of epibionts over the substrate surface was investigated. For that, an attempt to quantify the structure of *Circeis armoricana* (Polychaeta, Spirorbidae) settlement on *Dendrobeania murrayana* (Bryozoa) colonies was made. The worms significantly prefer the surface of lateral zooids in the youngest parts of bryozoan branches rather than any other locations within the colony. Alteration of hydrodynamical conditions by feeding bryozoan polypides was considered as a main reason of structure regularity in this system.

Orientation was studied on intertidal cirripedians *Semibalanus balanoides*. It was shown that on horizontal surfaces barnacles tend to orient their carino-rostral axis across the local surf direction. Observations on the feeding activity of *Semibalanus* indicated that the position barnacles prefer to occupy provides them the most effective feeding conditions.

The epibiosis associated with *Balanus crenatus* (Crustacea, Cirripedia) aggregations was studied to analyse more complicated system. Several species demonstrated specific preferences of substrata types, population of primary substrata being compared with barnacle shells and shells of living barnacles being compared with dead ones. Several epibionts were significantly more frequent on some parts of the barnacle shell surface than on the rest of it. A proposed explanation of those facts stresses the role of barnacles in environmental conditions altering and thus affecting the distribution of other epibiotic species.

The conclusion is that epibenthic assemblages demonstrate the regularity in spatial structure, and it depends, at least partially, on interactions between sessile organisms.