HYDROID ZONATION ALONG A MARINE CAVE OF THE PENISOLA SORRENTINA (GULF OF NAPLES)

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Summary
Hydroid zonation has been studied in a 80 m long cave. Three faunal zones have been individuated. Light, food supply and water movement seem to be limiting factors for the penetration and the development of the hydroid population.

The zonation of hydroids along a 80 m long marine cave of the Penisola Sorrentina has been studied by qualitative collections and a sampling from standard surfaces of 400 cm^2. The results yielded by the two methods revealed that the surface of the standard sampling is not sufficient for the study of the hydroids living in the cave. Only nine species have been collected with this method, without any indication about the zonation of the population. On the other hand a clear zonation has been shown by the qualitative sampling, with the identification of 36 species.

Three faunal zones have been distinguished (Fig. 1). Topography is the major responsible for hydroid zonation. In fact the quality of nearly all the ecological factors (i.e. light, water movement, sedimentation, fresh water infiltration with variation of salinity and temperature, food availability) depends essentially on the conformation of the cave. The type of substratum is also important.

Light is a limiting factor for hydroid penetration in caves, because of its already demonstrated influence on the sexual activity of many hydroid species. If no alternance of light and darkness occurs, the sexual products do not reach full maturation. This could be the explanation of the absence of hydroids after the cuniculus, where darkness is complete and continuous. A hypothetic hydroid population living in a completely dark cave should have developed a light-independent life cycle, or should depend on larval supply by outer populations, or should reproduce asexually only. This is not the case for the present cave. The majority of the species living outside the cave can penetrate within the cave for considerable distances. This means that the species living in full-light conditions can settle where light is very feeble. Many species known to possess zooxanthellae are present in the cave. No zooxanthellae have been found in the specimens collected in the cave. This means that these species can survive without their symbionts. Besides the above mentioned effect on reproduction, then, light seems to have no effect on hydroid zonation.

Even if the hydroid population is well structured and rich in species, large uncolonized surfaces are available all along the cave. Even such precocious settlers as hydroids, then, cannot develop enough to occupy spaces free from competition. In this case food supply is probably the limiting factor.

Substratum inclination is very important: the majority of the species tend to colonize the roof of the cave and the vertical parts of the walls. In these locations, in fact, sedimentation is very scarce and its limiting effects, due to the covering of the smaller colonies, are very feeble.

As for food supply and sedimentation, water movement is a conditioning factor. Big ripple marks are present on the bottom of the whole cave, indicating a good water exchange with the open sea. In fact the presence of fresh water is appreciable only near the roof of the terminal part of the cave. In this case water movement contributes also to decrease the effects of fresh water penetration.

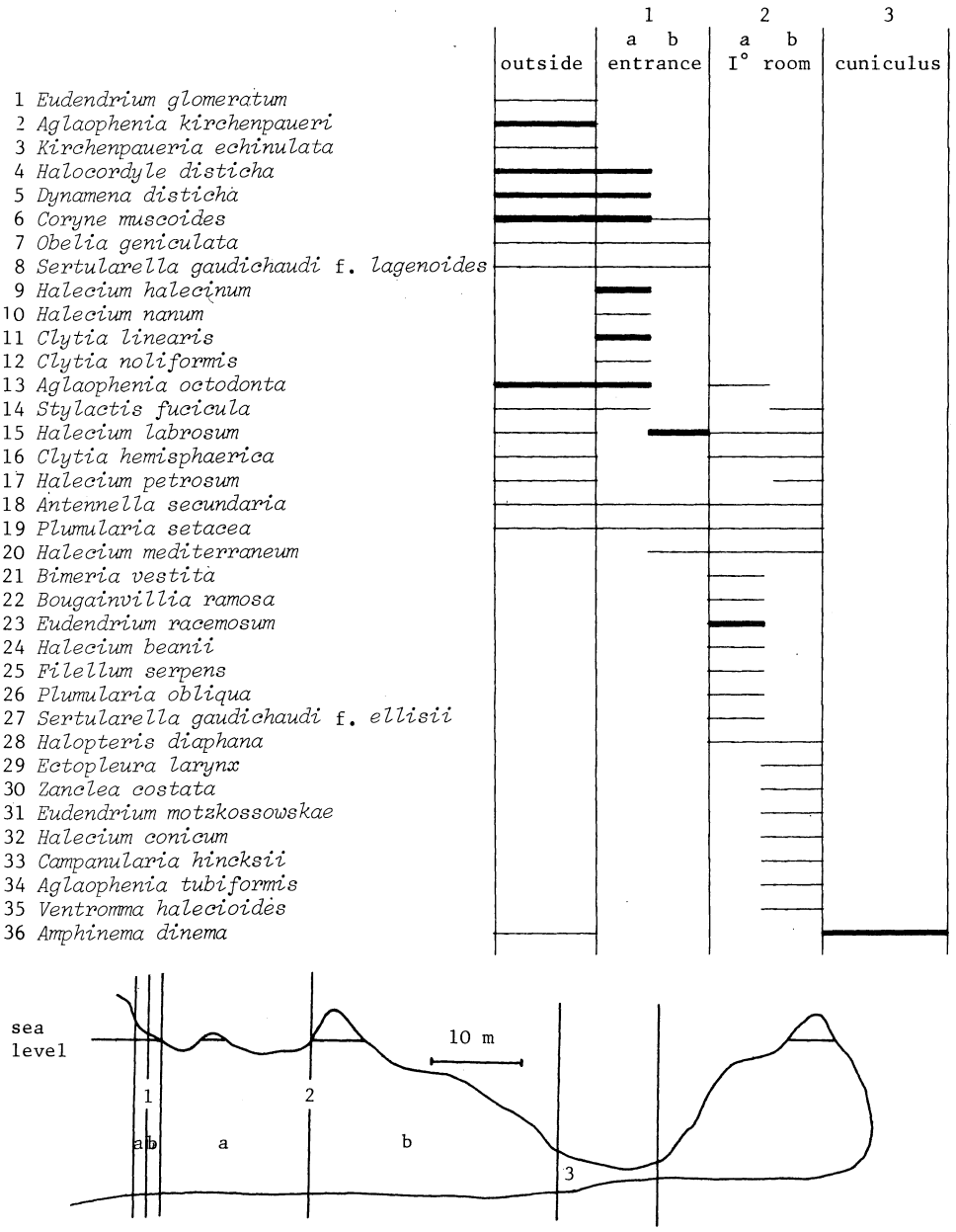

Fig. 1. Hydroid zonation in the Mitigliano Cave. The thin line indicates that the species is present. The thick line that the species is abundant.

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