Living sessile epiphytic foraminifera from *Posidonia oceanica* meadows of Ischia and Ponza Islands (Tyrrhenian Sea, Italy)

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*Posidonia* prairies play a significant role in temperate and tropical coastal marine systems, mostly in the structuring of habitats through the production of organic matter and oxygen. In the Tyrrhenian Sea (Vulcano Island), comparative studies on recent epiphytic foraminifera have been carried out only by Langer (1993). Preliminary analyses conducted on several samples of *Posidonia oceanica* allowed us to observe foraminifera in their living position and habitat. This study focuses on permanent or temporarily stationary foraminifera that are firmly attached to leaves by the secretion of adhesive materials such as glycosaminoglycans which could eventually become calcified (Langer, 1992). In order to study the living epiphytic assemblage only the foraminifera still attached to the *Posidonia* leaves have been considered. Living foraminifera (Rose Bengal stained) present in the sediment of *Posidonia* meadows, although alive at the sampling time, should not always be considered epiphytic because they could simply live in the sediment characterized by *Posidonia* meadows.

Several sheaves (6-7 leaves each) of *P. oceanica* have been sampled by a scuba diver in the seagrass habitat of Ischia Island and Ponza Island (Tyrrhenian Sea) at five stations comprised between 15 and 22 m water depth. The *Posidonia* leaves were immediately cut and immersed in a solution of distilled water and ethanol to preserve both the organic matter and the carbonate. The samples were initially studied at the optic binocular microscope to record the whole living assemblage that consists of foraminifera, still in their living position, bryozoans, polychaets and the calcareous algae *Hydrolithon, Melobesia* and *Pneophyllum* (Corallinaceae, Rhodophyta). Subsequently, pieces of the leaves with foraminifera have were on stubs and photographed at the SEM and with a digital camera.

Qualitative analyses of the foraminiferal content allowed us to recognize many epiphytic foraminifera. These are all hyaline taxa belonging to Cibicididae, Homotrematidae, Planorbulinidae and Rosaliniidae. The most abundant species are *Cyclocibicides vermiculatus, Lobatula lobatula,*
Miniacina miniacea, Neoconorbina posidonicola, Planorbulina mediterranensis, Rosalina bradyi and Tretomphalus concinnus. Electrae posidonia and Lichenopora radiata are the most abundant bryozoans. The leaves of *P. oceanica* are intensely epiphyted by diatoms, fungi and bacteria that are considered the principal food source for foraminifera (Lee & Anderson, 1991). We noticed that the apical, older portion of the leave is preferred by the foraminifera whereas the proximal portion presents only fewer juvenile forms of foraminifera (mostly *P. mediterranensis*). The flat and long leaf of *P. oceanica* present two sides colonized by different organisms. One side of the leaves is usually colonized by crustose corallines algae; not many foraminifera live on this side except for *P. mediterranensis* and *T. concinnus* that on the contrary, reach high frequencies. On the other side, where the algae are rare, a higher number of foraminifera and a more elevated species diversity (of foraminifera and bryozoans) are found. Furthermore, foraminifera are larger and more developed than on the algae-side. This may be due to mechanic reasons (foraminifera do not stick well to the algae) or, more likely, the presence of a carbonate substrate could limit the capacity of the foraminifera to join the bacteria, diatoms and fungi that represent their food source. The presence of the species *M. miniacea* is limited to the rhizomes, but it is very abundant and shows the characteristic pink/red color.

References
Table I

1 – (Sample IS-2; 15 mwd). Leaf of *P. oceanica* highly colonized by the calcareous algae *Hydrolithon, Melobesia* and *Pneophyllum* (Corallinaceae, Rhodophyta). This side is intensely epiphyted so that numerous thalla are superimposed. Conceptacles are also visible. 

2 – (Sample IS-2; 15 mwd). *Lobatula lobatula* (Cibicididae) is very frequent on *P. oceanica* leaves. We usually found it on the side not colonized by calcareous algae. It characteristically sticks to the leaf with the flat, dorsal side and it can be covered by organic material.

3 – (Sample IS-3; 20 mwd). *Planorbulina mediterranensis* (Planorbulinidae) and *Lobatula lobatula* (Cibicididae). 4 – (Sample IS-3; 20 mwd). *Planorbulina mediterranensis* (Planorbulinidae). Curve morphotype adapted to the curve substratum. 5 – (Sample IS-2; 15 mwd). *Planorbulina mediterranensis* (Planorbulinidae) is the most abundant foraminifer in our samples. We found it on both sides of the *Posidonia* leaves and when the algal cover was very thick. It takes different shapes, adapting to the morphology of the substrata. 6 – (Sample IS-4; 22 mwd). *Cyclocibicides vermiculatus* (Cibicididae) occurs only on the side of the leaf without calcareous algae. Furthermore, it is always found in association with Briozoans. 7 – (Sample IS-4; 22 mwd). The presence of the species *Miniacina miniacea* (Homotrematidae) is limited to the rhizomes of *P. oceanica*. This species usually shows the characteristic pink/red color, but it also occurs in a white morphotype.