

PRELIMINARY DATA ON SOME *POSIDONIA* FEEDERS

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ABSTRACT. Preliminary results of the analysis of gut contents from :
Sarpa salpa L., *Sphaerechinus granularis* Lam., *Haliotis lamellosa* Lam.,
Holothuria sanctori Delle Chiaje, *Holothuria polii* Delle Chiaje.

INTRODUCTION. In spite of the accumulation of much information on the faunistics of seagrass beds, studies on the functional characters of this ecosystem and quantitative evaluation of grazing by herbivores are relatively few (6). Seagrasses are digested by a very restricted number of organisms; only the sea-urchins, some fishes, turtles, Sirenia and a few species of birds graze on them (4). Most of the plant material are utilized by animals as semi-decomposed organic substances (3,8,12). In the Mediterranean, *Paracentrotus lividus* Lam. is the most conspicuous *Posidonia* feeder (9,11), but other animals consume, more or less regularly, *Posidonia oceanica* (L.) Delile. We give preliminary data on the feeding behaviour of some of these animals.

METHODS. Quantitative and qualitative analysis using the point frame method of Jones (5) was employed to study gut contents. Some samples have been analysed "in toto" to establish the dry weight (dwt.) of different components.

RESULTS. All the different species, collected in Corsica (Galeria), show a very low ratio of animals remains (frequency and/or dry weight percentage generally inferior to 5%). We have distinguished several feeding modes.

= Browsers : *Sarpa salpa* L. The browsing of *Posidonia* leaves by *Sarpa salpa* is a frequent feature (7), especially among adults. The examination of pieces of leaves seems to indicate that *Posidonia* is not digested and that the leaves covered by epiphytes (algal felt) are particularly appreciated (up to 85% of the pieces of leaves consumed).

= Grazers : *Sphaerechinus granularis* Lam. This sea-urchin is regarded by different authors as a herbivore (1,2,10); Cornet and Jangoux suspect it to be a selective deposit feeder. The study of its gut content enables us to class it among the herbivorous grazers. On rocky shore, it consumes various algae and preferentially encrusting Corallinaceae which are scraped into minute particles.

In *Posidonia* meadows, its diet appears to be well-defined : it consumes *Posidonia* rhizomes and roots (mean frequency : 51% and 19% dwt.) as well as algae of the sciaphilous under stratum (*Udotea petio-*

lata, *Peyssonnelia*). The examination of the fragments of *Posidonia* indicates that the sea-urchin scrapes the external part of the rhizomes, rich in tannin cells, and consumes the roots entirely. Thus, in sea-grass beds, *Paracentrotus lividus* and *Sphaerechinus granularis* are not competitors, the first browses the leaves and epiflora, while the second grazes on the rhizomes and the algal undergrowth.

= Grazers and detritus feeders : *Haliotis lamellosa* Lam. On rocky shore, *Haliotis* adopts a grazing behaviour, it scrapes the algae and a small fraction of fauna. In *Posidonia* meadows, it consumes almost exclusively *Posidonia* leaves (mean frequency : 89%). Since all the decay stages have been observed, it would seem to be able to digest these leaves. Its localization on the low side of pebbles suggests that it rather feeds on shed leaves than on living leaves of seagrass.

= Detritus feeders : a) *Holothuria sanctori* Delle Chiaje. The sediment fraction is comparatively low for this species and the mean frequency of *Posidonia* remains is about 20%. All the degradation stages of blades have been observed. The presence of a non-negligible fraction of rocky shore algae (about 40%) suggests also a browsing behaviour which could explain the nocturnal moving observed on rocky bottom.

b) *Holothuria polii* Delle Chiaje. For this species, the sediment fraction is very high (up to 85% dwt.). The plant matter is comparatively abundant (up to 15% dwt.) of which 95% are *Posidonia* leaves at different stages of degradation.

According to Traer (11), the *Posidonia* remains found on the gut contents of *Holothuria polii* and *Holothuria tubulosa* Gm. could come from *Paracentrotus* faeces ingested by the animal. In the case of *Holothuria polii*, the fraction of still intact pellets, from *Paracentrotus* or from other animals, is very small (0.5% dwt.), and it is difficult to draw conclusions. On the contrary, for *Holothuria sanctori* the ratio of undamaged ingested pellets may be very important (up to 13% dwt.), and the *Posidonia* particles may result from disorganized faeces. Thus, the *Paracentrotus-Holothuria* trophic relations would constitute an important sequence in the use of alimentary resources of *Posidonia oceanica*.

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