

A Compared Phenology between the Mar Menor (Murcia, S.E. Spain) seaweeds and the Mediterranean ones

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Mar Menor is a coastal-lagoon placed in the South East of Spain. Its area is about 135 Km² and its deepest profundity is 6.5 m. The salinity varies between 42‰ and 49‰ along the year. Its water is oligotrophic and the temperature varies between 9°C minimum and 31°C maximum (PEREZ-RUZAFÁ, 1989).

A research on 75 benthic macrophytes species has been carried out in the period 1985-1987. They were taken from 124 samples: 40 in Spring (March-November), 46 in Summer (June-August), 18 in Autumn (September-November) and 20 in Winter (December-February). The patterns carried out by CORMACI *et al.* (1984) in their study about the reproduction in East Sicily Ceramiales has been followed. The comparison has been made with the phenology data given by FELDMANN (1937-42), RIBERA (1983), BARCELO (1987) and SOTO (1987).

Summer has been the season with the highest number of species (60 taxa) present in the zone, followed by Spring (54 taxa), Winter (45 taxa) and Autumn (38 taxa). Only 26 of the 75 studied taxa fit to the vital-cycles described for the Mediterranean sea. All the rest choose different strategies in order to adapt themselves to the notable seasonal dynamism of the lagoon.

During the warmest months the number of taxa with a tropical affinity increases (*Acetabularia calyculus*, *Alsidium corallinum*, *Spyridia filamentosa*, etc). The presence of Boreal taxa, however, hasn't been observed during the Winter period.

Other taxa have been only observed in the lagoon when they are more frequent in the Mediterranean sea. We are talking about *Wrangelia penicillata*, *Antithamnion cruciatum*, *Styposcaulon scoparium*, *Dictyota dichotoma*, *Boergeseniella fruticulosa* and *Callithamnion corymbosum*. During the cold months *Padina pavonica*, *Alsidium corallinum*, *Cystoseira compressa* and *C. ercegovicii* disappear from the lagoon.

Species that are fertile during the whole year in the Mediterranean sea tend to be unfertile or just disappear in the lagoon during Autumn-Winter. That is the behaviour of *Fosliella farinosa*, *Chondria tenuissima*, *Herposiphonia secunda*, *Titanoderma litorale* and *Chylocladia verticillata*.

In other cases the species usually loose some parts of their thallus during Autumn and Winter. This is the strategy of *Sphaecelaria rigidula*, *S. tribuloides*, *Gelidium crinale* y *Cladophora* spp.

Cladophoropsis modonensis, *Acetabularia acetabulum* y *Siphonocladus pusillus* are fertile during the warm season in the Mediterranean sea. In the lagoon they have a precocious development (February-March), related to the swift rising of the temperature of the lagoon.

Ectocarpus siliculosus, an opportunist species appears in Mar Menor in Autumn and Spring, when the pioneer communities settle the lagoon.

In the Mediterranean sea (Figure 1) the presence of the taxa is almost stabilized (77-86%) along the year. In the lagoon a deep seasonal fluctuation appears (79-89% in Spring-Summer to 54-56% in Autumn-Winter).

A light decrease of the maximum fertility can be observed in this lagoon comparing it with the Mediterranean sea (55% in the Mediterranean sea and 47% in Mar Menor). The presence and fertility have a similar behaviour, we mean that in the Mediterranean sea the fertility index is stabilized (55-44%) and in Mar Menor we can see a clear seasonality (47-49% in Spring-Summer and a 20-17% in Autumn-Winter).

The plants that settle these environments modify their phenologic behaviour from the one that they have in the close Mediterranean sea. In Mar Menor we can see a clear unfavorable period during Autumn-Winter specially in Rhodophyceae, they are reduced to a 24% in the cold months. In the Mediterranean sea the maximum decrease is in Autumn (68%).

The percentage of annual taxa against the perennial ones is, here, higher than in the Mediterranean sea. MATHIESON & PENNIMAN (1986) observed the same in the estuary of New Hampshire (USA).

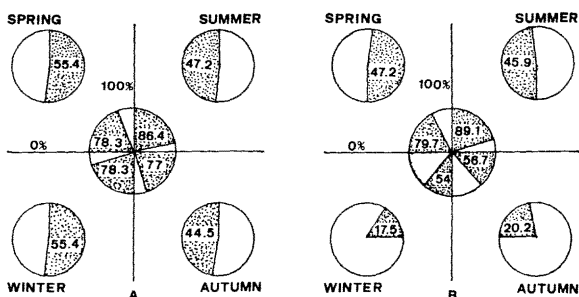


Figure 1. Percentages of taxa present in each season (large circle) and percentage of fertile taxa in each season (small circle) in the Mediterranean sea (A) and Mar Menor (B).

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