

OBSERVATIONS ON THE DISTRIBUTION OF Cymodocea nodosa(UCRIA)ASCHERS. PRAIRIES AROUND THE ISLAND OF ISCHIA (GULF OF NAPLES).

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Résumé. Dans le cadre d'une recherche relative à la phanérogamie marine Cymodocea nodosa on a étudié sa distribution autour de l'île d'Ischia (Golfe de Naples). Cymodocea forme des prairies très étendues soit superficielles (0.5 - 6m), soit profondes (9 - 21m); en particulier, on la trouve surtout dans les parties nord et nord-est des côtes de l'île. Dans la zone plus superficielle, C. nodosa forme des prairies et a aussi une distribution à taches; elle s'accroît, en outre, dans les chenaux intermattes et sur les mattes de Posidonia. Les prairies plus profondes se trouvent entre la côte rocheuse et la limite supérieure de la prairie profonde de Posidonia.

The distribution of the seagrass Cymodocea nodosa(UCRIA)ASCHERS. together with its bathymetric limits has been investigated around the Island of Ischia (Gulf of Naples). The relationships between the Cymodocea prairies and the Posidonia oceanica (L.)DELILE beds, which cover large areas around Ischia (COLANTONI et al., 1979 ; COLANTONI et al., 1982), were noted; the presence of another phanerogam, Zostera noltii HORNEM. in the Cymodocea prairies was also observed.

Transects, both along the coastline and from the coastline to the open water were performed all around the island using the bathyscope. Underwater observations by Scuba-diving were used to localize the deep prairies and to obtain a detailed map of one C. nodosa prairie. A rope of a known length, marked in meters, was utilized to measure the surface colonized by this phanerogam.

Preliminary observations, started in summer 1983, in the first 20 meters of depth, showed that C. nodosa was widely distributed around the island, from 0.5 m to 21 m, although, unlike the P. oceanica beds, the distribution was uneven. Cymodocea nodosa seems to be more abundant in the north and north-east coasts of the island (Fig. 1). In shallow waters, between 0.5 m to 6 m, several well-defined stands were found (Castello Aragonese, East-North East, between 2 and 6 m, on an "intermatte" Posidonia channel; San Pietro, North-East, from 0.5 to 4 m; Lacco Ameno, North, 2.5

m). Moreover, *Cymodocea* colonizes substrata adjacent to the defined prairies; between two prairies it shows a patchy distribution mixed with the rocky substratum and *P. oceanica* patches. In deep water only defined prairies were found (San Montano, North, 15 m; in the Bay of San Pancrazio, South-East, from 6 to 10 m; in front of "Scarrupata di Barano", South-South East, from 9 to 14 m and from 10 to 14 m; Punta Caruso, West-North West, from 17 to 21 m). The deep *Cymodocea* prairies are located between the rocky coastline and the upper limits of *Posidonia* meadows, forming a band between the two systems. Like *Posidonia* (COLANTONI et al., 1982), it is not present in the Bay of Maronti (Fig.1). In the located prairies the colonized substratum varies from sand (Lacco Ameno) to coarse sand (San Montano) and mud (San Pietro); furthermore *Cymodocea* settles also on both dead (Castello Aragonese) and live ("Scogli di Sant'Anna", 1.5m) *Posidonia* "matte". Erosion phenomena were observed both in the deep prairie of San Montano and in the shallow stands of San Pietro and Castello Aragonese, mostly in winter time. A recolonization, however, took place in the same areas in a different season. The hydrodynamic energy present along the north oriented coasts of the island, determines a continuous alteration of the prairies.

A detailed map, with the definition of the exact surface colonized by *C. nodosa*, was drawn only for the shallow prairie of San Pietro. The total covered area, determined in May 1983, was about 3400m² with a 85m maximum length in the direction North East-South West, and a 40m mean width in the direction South East-North West (Fig.2). This prairie is settled on a terrace formed by a thick interlacement of old rhizoms and roots of *Cymodocea* plants. The north-west edge is almost entirely protected by an artificial cliff. The east and north-east oriented borders show a step of about 30cm, beyond the north-east border the plant colonizes the adjacent sandy substratum. The south-south west border is settled on sandy substratum very close to the shoreline. This kind of settlement seems to reflect a constant expansion of the prairie whose youngest limit is found to be at the southern side. Observations in January 1984 showed an erosion along the north-east and east sides of the prairie. In this prairie and in the shallow prairies of Castello Aragonese and Lacco Ameno an intrusion of the seagrass *Zostera noltii*, was observed. The *Zostera* colonization in the *Cymodocea* prairies changes according to the season.

In conclusion, unlike *P. oceanica*, the *C. nodosa* prairies are not stable since they are subjected to continuous alteration, therefore it is useful to follow their evolution over a prolonged period. Moreover, *Cymodocea nodosa* and *Posidonia oceanica* seem to colonize adjacent substrata, the former in shallower depths, as also found by MEINESZ and SIMONIAN (1983). *Cymodocea* colonizes both *Posidonia* "intermatte" channels and

"dead matte" in confirmation of an earlier report by ALEEM (1955), and only in few cases a coexistence of the two phanerogams ("Scogli di Santa Anna") has been found.

Future investigations will attempt to establish the relationships between the three different marine phanerogams found around the Island of Ischia and factors controlling their distribution.

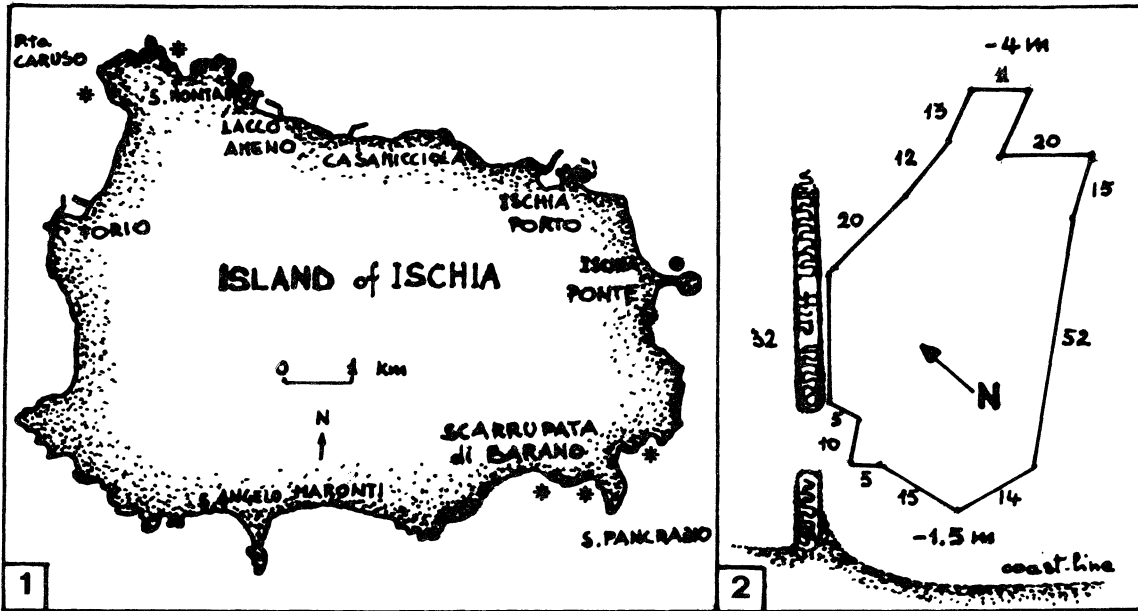


Fig. 1. Map of the Island of Ischia with the location of *C. nodosa* prairies. Shallow(●), deep(*) prairies.

Fig. 2. Map of the "San Pietro" prairie.

Acknowledgements

This work is a part of the "Cymodocea project" supported by the "Comune di Ischia".

References

- ALEEM, A.A., 1955. Structure and evolution of the sea-grass communities *Posidonia* and *Cymodocea* in the southeastern Mediterranean. Essays in the natural science in honor of Captain Allan Hancock on the occasion of his birthday, July 26, 279-298.
- COLANTONI, P., P. GALLIGNANI, F. CINELLI & E. FRESI, 1979. Premières données sur la sédimentologie et la distribution de *Posidonia oceanica* autour de l'île d'Ischia-Golfe de Naples (Italie). Rapp. Comm. int. Mer Médit., 25/26(4):203-204.

- COLANTONI P., P. GALLIGNANI, E. FRESI & F. CINELLI, 1982. Patterns of Posidonia oceanica (L.) DELILE beds around the island of Ischia (Gulf of Naples) and in adjacent waters. P.S.Z.N. I: Marine Ecology, 3(1):53-74.
- MEINESZ, A. et M. SIMONIAN, 1983. Cartes de la végétation sous-marine des Alpes Maritimes (côtes françaises de la Méditerranée). II La végétation mixte à Cymodocea nodosa - Zostera noltii - Caulerpa prolifera et la limite supérieure de l'herbier de Posidonia oceanica entre Juan-les-Pins et Golfe Juan. Ann. Inst. Océanogr. Paris, 59(1):21-35.