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Phytocenoses in the Mar Piccolo in Taranto (Ionian Sea, Southern Italy) : mesolittoral level and infralittoral fringe

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A study has been made of phytocenoses in the mesolittoral level and upper infralittoral fringe of the Mar Piccolo at Taranto (Ionian Sea - Southern Italy), an area till now scarcely studied from a botanical point of view except for some notes (PIERPAOLI,1923;1959;1960). The Mar Piccolo, which has a surface area of 20.72 Km^2 lies to the North of the city of Taranto and is divided by two promontories of land into two basins, which are called the First and the Second Inlets. It contains several submarine fresh water springs, called "citri". This study was carried out, during the months of June and September 1987, using the phytosociological method. The samples were taken from 21 squares of 400 cm^2, each square being at a different station. Twentyone Rhodophyceae, 1 Phaeophyceae and 18 Chlorophyceae in addition unclassified Cyanophyceae and Diatoms were found. It is noteworthy that Hypnea cervicornis J.Agardh which is spreading accross the Mediterranean was found there. In the mesolittoral level the predominant species are Enteromorpha prolifera (Mueller) J.Agardh and Enteromorpha intestinalis, (L.) Link (RIZZI-LONGO and GIACCONE, 1974). In highly polluted areas these species usually substitute the Enteromorphetum compressae association. As pollution increases even these species become scarcer and finally are substituted by a coating of Cyanophyceae and Diatoms in colonies. This process was observed in September at the stations near sewer outlets. In the upper infralittoral fringe the Pterocladio-Ulvetum association is well represented. From a phytosociological point of view there are the following syntaxa: Pterocladio-Ulvetum (25% of the species found); Acrochaetietalia (22.5%); Cystoseiretalia (12.5%); Rhodymenietalia (12.5%), whose presence is probably due to the increasing turbidity. A considerable incidence (27.5%) of the ubiquitous species was also observed. In particular it was noticed that Ulva rigida C.Agardh, which was predominant in June, was substituted in September by Ulva curvata (Kuetzing) De Toni (this substitution has been observed in the Venetian Lagoon by RIZZI-LONGO and GIACCONE (1974)) and by Ulva scandinavica Bliding. Similarly Enteromorpha flexuosa (Wulfen ex Roth) J.Agardh and E.intestinalis, which were dominant in June, were substituted by E. prolifera in September. In order to evaluate the environmental quality the following biological indexes (CORMACI et al., 1985) have been calculated: 1) mean total covering expressed as a percentage (June:64.3%, September:45.7%), 2) mean number of species found in the samples (4.6 in June, 4.1 in September), 3) mean diversity index (H'=1.2 in June and 0.8 in September); 4) mean Rhodophyta/Phaeophyta ratio (R/P=3 in June and 2 in September). The values found, both in June and in September, show that the system balance had been strongly altered; in fact the mean number of species for each sample and the values of mean diversity index were very low. Even if the R/P index values were apparently regular, it is necessary to consider that there was a very high percentage of samples (85.7% in June and 90.5% in September) whose R/P ratio could not be calculated owing to the lack of Phaeophyceae and even Rhodophyceae. In September the environmental conditions compared with June showed a worsening. In fact in this period, high temperatures in the surface waters (28°C) were recorded with a consequent reduction in the oxygen concentration, which was already low as a result of the effects of mineral oils and hydrocarbons that are always present on the surface. Variance analysis was carried out for the values of the above-mentioned biological indexes of each sample, in order to find out whether they varied by months and/or by the specific characteristic of the two Inlets. The results showed that only the values for total covering were influenced, but these varied only by seasons. The other three indexes were not influenced either by seasons or by the typical characteristics of the two Inlets. In order to underline the existence of real differences between the two Inlets of the Mar Piccolo, a similarity analysis was carried out using Sorensen index, for both sampling months. This analysis showed that the First Inlet stations were not homogeneous. This is probably due to the larger scale of the residential development along the coast of this basin as compared to that of the Second Basin; such developments cause variations of ecological factors along the coast, which influence the composition of the species making up the algal mantle. The stations of the Second Inlet had virtually similar results for the composition of the species. This leads to the conclusion that in this basin the environmental conditions were virtually homogeneous.

CONCLUSIONS

This research confirms that the Mar Piccolo in Taranto is a basin with typical lagoon peculiarities. This has been underlined by the general appearance of vegetation, which is typical of lagoon environments in the High Adriatic. In particular it shows many similarities with the Venice and Grado Lagoons. A typology study of vegetable associations has shown that the basin is suffering from urban development projects, which have degraded its environment.

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Connaissances actuelles sur la flore benthique de la Sardaigne. Quelques considérations

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Ce travail a pour but de faire le point sur les connaissances actuelles de la flore benthique et surtout d'évaluer l'actualité effective d'un recensement floristique des entités algales benthique présentes en Sardaigne qui puisse être mis en rapport avec les connaissances géobotaniques de la Méditerranée. En effet, certains travaux phytogéographiques (Cormaci, 82; Furnari, 84) ne considèrent pas le contingent algal sarde-corse dont les signalisations dépassent le nombre de 600.

La flore de la Sardaigne a été extraite des travaux suivants:

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MOLINIER R., 1955 - Apercu de bionomie marine sur le cotes septentrionales de la Sardaigne. Bul.Staz.Acquic.Peche, Castiglione 7:373-400

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SOLAZZI A., 1968 - flora algale della Sardegna Nord-Occidentale (I.di Tavolara , Molara e Scoglio Molarotto) - Accademia Naz. dei Lincei Ser.VIII Vol XLV fasc. 6

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Le contingent actuel arrive à 427 entités partagées en 103 Phaeophyceae, 240 Rhodophyceae, 57 Chlorophyceae et 27 Cyanophyceae.

Le rapport Rh/Ph est de 2,3, ce qui montre que le nombre des Rhodophyceae est certainement sous-estimé, surtout si on le compare à celui de la Méditerranée centre-orientale qui est, lui, d'environ 3,1.

Le spectre chorologique (fig. 1) est donc cohérent avec celui des principales flore méditerranéennes. Le degré de superposition floristique évalué sur les espèces sardes qui soient également présentes dans d'autres zones de la Méditerranée mais qui ne soient pas cosmopolites, nous permet de déterminer le niveau d'affinité entre la flore sarde et les autres (fig. 2).

On remarque un degré de superposition considérable entre la Corse, l'Ouest et le Nord-Est de la Sicile, alors que celui qui concerne la flore de l'Adriatique est par contre plutôt difficile à interpréter.

Il est nécessaire de préciser que: a) les travaux de Piccone et Barbey remontent au siècle dernier; b) de nombreuses signalisations sont douteuses et ne sont pas controlables du fait que les exemplaires d'herbier n'existent plus; c) a cette époque, les échantillonnages furent effectués à l'aide de bennes au lieu que grâce à l'observation directe; d) les localités examinées sont surtout celles du sud de l'île et quelques-unes d'entre elles seulement ont été examinnées selon une méthode moderne.

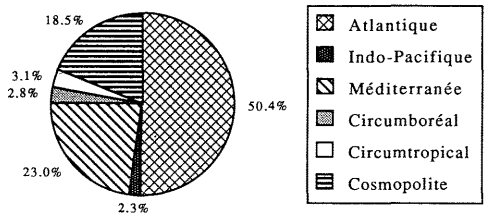

Fig. 1- Spectre Chorologique des entités algales de la Sardaigne

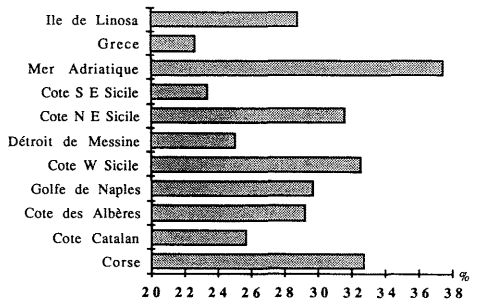

Fig. 2 - Niveau de superposition entre le contingent algal sarde et celui des autres zones de la Méditerranée

En Conclusion on peut donc affirmer que la flore algale de la Sardaigne est bien loin d'être définie surtout en ce qui concerne les Rhodophyceae. Notre objectif futur est celui de déterminer les typologies les plus caractéristiques de l'île et d'obtenir grâce à elles, avec des récoltes saisonnières sur les différents niveaux du litoral, un échantillon suffisamment représentatif pour la définition de la flore de la Sardaigne.

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