Scapharca inaequivalvis: A RECENT INVADER OF THE SOUTHERN LAGOONS IN THE PO RIVER DELTA PLAIN.

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ABSTRACT. The Indo-Pacific bivalve Scapharca inaequivalvis, recent invader in the coastal waters of The Adriatic Sea, was also observed within the lagoons of the southern part of the Po river delta plain. The species is perfectly adapted to the brackish environment. It colonizes both the soft muddy bottoms and the hard substrata of the serpulid-reefs.

The Indo-Pacific bivalve Scapharca inaequivalvis (BRUGUIERE) appeared along the Upper Adriatic coast in 1969 and since then it spred to the north and to the south colonizing successfully the sandy shores of this basin (GHISOTTI, 1972, 1973, 1974; RINALDI, 1972, 1973; GHISOTTI & RINALDI, 1975). This species quickly became one of the unchallenged dominants of the SFBC biocoenosis (sensu PÉRÈS & PICARD 1964) in the Upper Adriatic Sea. In a few years S.inaequivalvis invaded the autochtonous community of suspension feeders causing a strong numerical decline of several species such as Chamelea gallina (LINNE) and other edible clams once flourishing in this environment. Possibly S.inaequivalvis took advantage of the anoxic crisis linked to the eutrophication phenomena recently affecting the Upper Adriatic. In fact, this mollusk is potentially more tolerant to low-oxygen levels than other species due to the presence of hemoglobin in its erythrocytes (CHIANCONE et al., 1979, 1981; VERZILI et al., 1982). Furthermore, some indications of a better adaptability to anaerobic metabolism with respect to C.gallina derive from an enzymatic comparative study of their PK and PEPCK modulators (CORTESI & CARPENE', 1981).

The extraordinary ecological potential of S.inaequivalvis received a full confirmation from the totally unaspected discovery of its adaptation to lagoonal brackish environments.

A recent survey of the southern part of the Po river delta plain (POLUZZI & TAVIANI, 1984) revealed infact the large presence of this bivalve within two lagoons, i.e., Sacca degli Scardovari and Sacca del Canarin (fig.1). Both lagoons are characterized by a high variability of the physical-chemical parameters. For instance, the average salinity of Sacca degli Scardovari never rises up to 21.7 ‰ , ranging between 13.0 and 30.8 ‰ (COLOMBO et al., 1979). The species appears to be perfectly acclimatized within the lagoonal environment where it forms large communities together with the brackish cockle Cerastoderma glaucum (BRUGUIERE) (Scapharca-Cerastoderma INSUS-EPSUS association of POLUZZI & TAVIANI, 1984). The lagoonal populations of Scapharca observed in late summer 1983 were made up by adult specimens attaining an average size (20 specimens measured) of 49.9 mm in lenght (O.R. = 41-63; S.D. = 7.11; V.C. % = 14.2).

Small (max. diameter ca. 15 mm) specimens of S.inaequivalvis were found also within the framework of Ficopomatus serpulid-reefs at three stations (fig.1). It is likely that larvae of Scapharca can settle within the serpulid-reef and have, at least temporarly, a normal development and growth on such an unusual bottom.

A tolerance of S.inaequivalvis to seawater dilution was already evident even before our finding as suggested by the presence of this species at the mouth of the lagoon of Porto Caleri, northern part of the Po river delta, reported by POLUZZI et al. (1981).

Remark of interest is that Scapharca inaequivalvis might have enabled to study the strategy of an opportunistic species that colonized a new body of seawater. Unfortunately this possibility has been largely eluded because only a few qualitative and semi-quantitative observations on the penetration of this mollusk into the Mediterranean exist (MONTANARI & RINALDI, 1981). For paleontologists concerned with the recurrent problem of a suddendly spreading taxon in a new environment, the history of the colonization of the Adriatic Sea by S.inaequivalvis would have been an excellent actualistic model.

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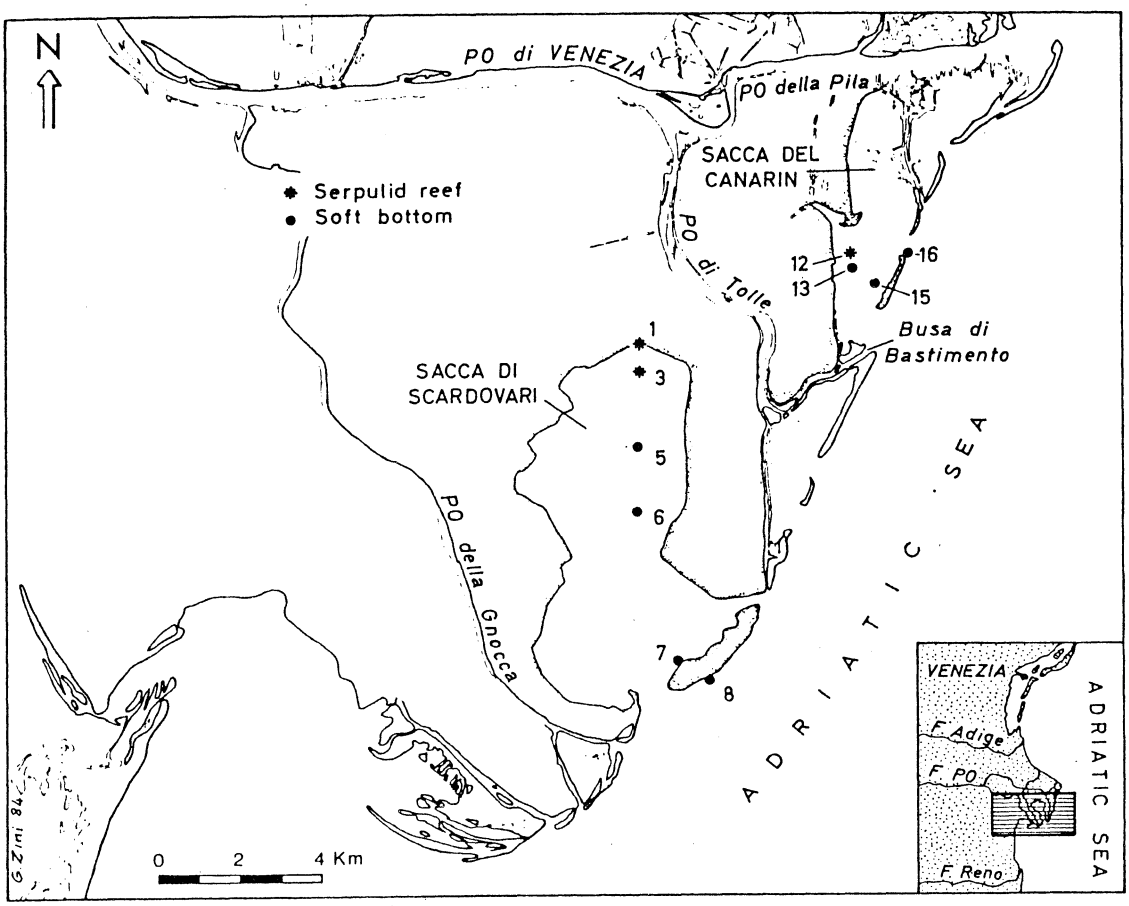

Fig.1 - Simplified map of the southern Po river delta plain showing the stations with Scapharca inaequivalvis (station identification after POLUZZI & TAVIANI, 1984).

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