

Trace metals in sediment cores from Santa Giusta Lagoon (Sardinia, Italy)

Marco SCHINTU, Pulchérie GUENEAU*, Patrizia MELONI and Antonio CONTU

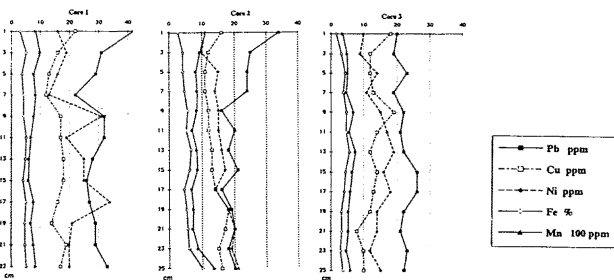
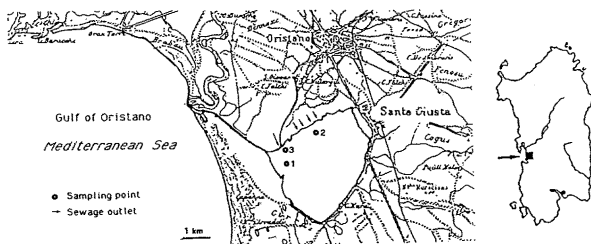
Università di Cagliari, Istituto di Igiene e Medicina Preventiva, CAGLIARI (Italy)

*International Marine Centre Lungomare, TORREGRANDE (Italy)

The Santa Giusta lagoon, on the western coast of Sardinia, in the Gulf of Oristano, is the third largest coastal lagoon of Sardinia (830 ha). In the 60's the lagoon was among the most productive fisheries in Europe (850 kg/ha). However, the increasing discharge of raw sewage from Oristano and Santa Giusta (about 40.000 inhabitants), agricultural runoff and reduced water circulation considerably lowered the water quality and the fish production. Moreover the lagoon suffers from a large development of *Ficopomatus enigmaticus* banks and from occasional microalgae blooms, along with anoxic conditions - in the ultimate years, several massive fish death occurred. No major industrial development is present in the area.

In October 1991 sediment cores were taken from three sites (cf. Fig.): in front of a canal linking the lagoon with the sea, built in 1952 to improve the water renewal (K1); in the area exposed to waste discharge from a series of small canals (K2); at the outlet of the S. Giovanni canal, which carries untreated wastewaters from Oristano (K3). The frozen cores were sliced into 1 cm (superficial sediment) and 2 cm sections and air dried. Subsamples were ground in an agate mortar, sieved, and the fraction < 75 µm was collected for the analysis. Metals were extracted with a mixture of concentrated HNO₃ and HCl (90:10) (SCHINTU *et al.*, 1991). Lead, Cd, Cu, Ni, Fe and Mn were determined by atomic absorption spectrophotometry. Organic carbon was determined by digesting the sediments with H₃PO₄ and 0.1 N K₂Cr₂O₇ in H₂SO₄, and back-titrating the excess with 0.25 N FeSO₄.

Cadmium concentrations were always below the detection limit of the method (0.1 µg/g d.w.). The mean organic carbon concentration in the cores (C%) was: K1 1,69%; K2 1,09%; K3 0,96%. Lead, Ni, Cu, and organic carbon concentrations in core K1 were higher than in cores K2 and K3. Metals are probably associated with the organic matter, which is an excellent scavenger for a large number of them. In cores K2 and K3 metal concentration profiles show comparable tendencies and the concentration of all metals but Pb does not vary significantly as a function of depth. While the sediments present low concentrations of these metals, even when compared to other sardinian lagoons and coastal areas exposed to sewage discharge (CONTU *et al.*, 1983; SCHINTU *et al.*, 1991), the increase of the Pb concentration in the upper profile of the cores K1 and K2 suggests a growing input of this metal in the lagoon throughout the last years.



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