

Bioaccumulation of Heavy Metals in *Posidonia oceanica* (L.) Delile and *Cymodocea nodosa* (Ucria) Aschers. at an uncontaminated site in the East Coast of Spain

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Introduction and methodology.

The scarce bibliographic references to heavy metal content in mediterranean seagrasses give data on mercury (Augier et al., 1976, 1977, etc.) and other metals (Catsiki et al., 1987). Despite the fact that in these works heavy metal concentrations are compared in different seagrass species and different fractions of the plants, knowledge in this field is still incomplete, since there are no data on some important elements, like Pb or Zn.

In the present study, we compare Hg, Cd, Pb and Zn concentrations in sediment, detached dead leaves and several anatomic parts of *Posidonia oceanica* and *Cymodocea nodosa* collected at an uncontaminated site (Punta dels Molins, Dénia, Alacant, Spain) in November 1989.

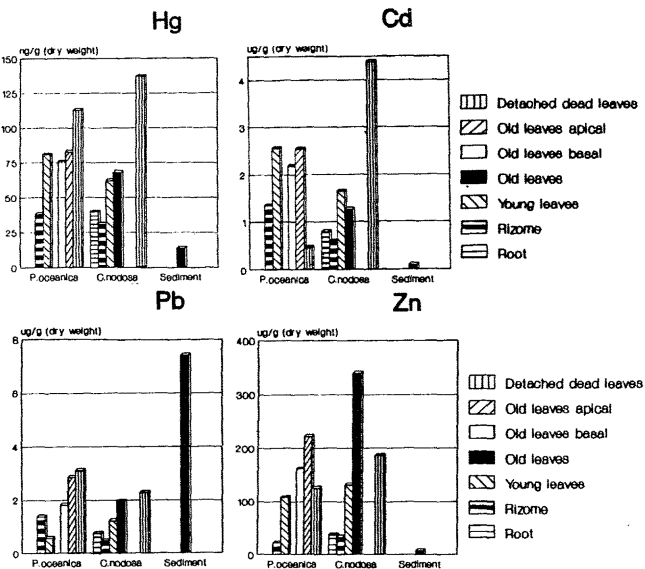
Plants were fractionated at the laboratory into roots, rizomes, young leaves and old leaves for *Cymodocea nodosa* and rizomes, young leaves, basal parts of old leaves and apical parts of old leaves for *Posidonia oceanica*. All the leaves (included detached dead ones) were scraped to remove epiphytes and rinsed with ultrapure water. Analysis was carried out with Perkin Elmer AAS equipment on the <250 µm fraction of lyophilised sediments and on lyophilised plant material after warm digestion with concentrated nitric acid.

Results and discussion.

Values obtained for sediment are comparable to levels found at uncontaminated zones of the Mediterranean (Hernández et al., 1985). All the metals except lead were more concentrated in the plant organs than in the sediment. The metal concentration in the different parts of the plant, in both species, increased generally in the order: rizomes < roots < young leaves < old leaves (in *P. oceanica*, basal parts < distal parts) < dead leaves; as was also found by Augier et al., 1976, 1977; Catsiki et al., 1987; Lyngby & Brix, 1989; etc. Values for both species were quite similar, but with some difference. Whereas concentration of Cd in *C. nodosa* is much higher in dead leaves than in old leaves, the opposite is the case in *P. oceanica*. This can be due to the fact that a considerable amount of cadmium, unlike other metals, is contained in the soluble fraction of the leaves (Fabris et al., 1982), and lost during their senescence (Lyngby & Brix, 1989), while a new cadmium could be adsorbed by the empty walls of decomposing cells. Specific differences in the amount of cadmium contained in that soluble fraction and in chemical characteristics of detritus could explain the differences observed.

Values of Hg and Cd content in the two species can generally be considered similar to those found by other authors, mentioned above, at uncontaminated zones of the Mediterranean.

Pb and Zn levels are comparable to the ones found in other seagrass species in other geographic regions with a low degree of contamination (Ward, 1989; Nienhuis, 1986).



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