

CONCENTRATION OF MERCURY IN MARINE PHANEROGAM *POSIDONIA OCEANICA*. PRELIMINARY RESULTS

Christine PERGENT-MARTINI, Patricia GUERRINI

EP CNRS 0075, Ecosystèmes Littoraux, Université de Corse, BP 52, 20250 Corte, France

The accumulation of trace metal in the tissues of marine phanerogams has been the object of numerous studies. It seems that mercury concentration measured in the leaves of *Posidonia oceanica* is representative of levels present in sea water (AUGIER *et al.*, 1978). The base of the leaves of *Posidonia oceanica* (sheath) presents the particularity of remaining attached along the rhizome, after the fall of the limb, and of remaining within the mat for several decades. Furthermore, thanks to the variations in thickness of the sheath (a cycle limited by two minima of thickness corresponds to one year), it is possible to date their period of formation very precisely with a technique which can be assimilated to dendrochronology : lepidochronology (PERGENT, 1990). These remains of sheath, which can inform us on the conditions prevailing at the time of their formation (temperature, turbidity, sedimentation rate,...) can also memorize levels of radioelements present in the environment (e.g. Caesium 137 in CALMET *et al.*, 1991).

For the purpose of the present study, 48 orthotropic rhizomes were collected in January 1993 from one site of the bay of Calvi (Corsica) by scuba-diving at -10 m depth. They were separated into three equal parts dissected according to the lepidochronological method. *Posidonia oceanica* leaves were separated according to their type (adult or intermediate). The old sheaths, present on each rhizome were very carefully detached, respecting the distichous insertion order (rank), and numbered from the more recent (near the living leaves) to the older (near the base). Sections of rhizomes, delimited by two minima thickness (corresponding to one annual cycle), were equally selected. Mineralization of the samples was realised with a mixture of acids (sulfonitric) and oxygenated water, in Nalgene FEP Teflon bottles put in the microwave. Dosage of mercury was performed with the help of a flameless atomic absorption

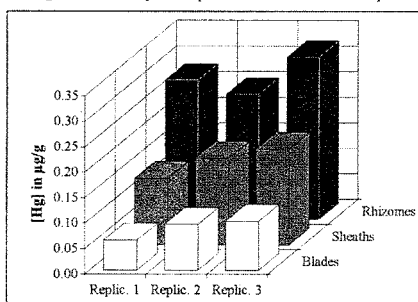


Figure 1 : Mercury levels in the different tissues of *Posidonia oceanica* collected in January 1993.

spectro-meter (MAS 50B, Perkin Elmer). If, for a given structure (blades, old sheaths or rhizomes), mean mercury concentration levels vary according to its age, one notes that registered levels in the rhizomes are higher than those registered in other structures (Figure 1). This preferential accumulation of mercury in the rhizomes is already mentioned in the literature on sites of weak environmental contamination (MASERTI *et al.*, 1988).

The date of sampling (season) could however also play an essential role in the accumulation of mercury in

the leaf tissues of *P. oceanica*, as this has already been observed with other phanerogams (WARD, 1987). Our results show that mercury concentrations do not occur at random in the sheaths of *P. oceanica*. Concentrations are strongly correlated to the weight of sheaths ($y = 0.29 - 0.55 x$, $r = 0.74$). By erasing this correlation it is possible to assess the difference between theoretical concentration (only due to the weight) and observed concentration (Figure 2). It then appears that this difference reflects seasonal patterns of accumulation. They provide evidence of the occurrence of cycles of mercury concentration, according to sheath insertion rank. These cycles are synchronized with the sheath thickness variation cycles.

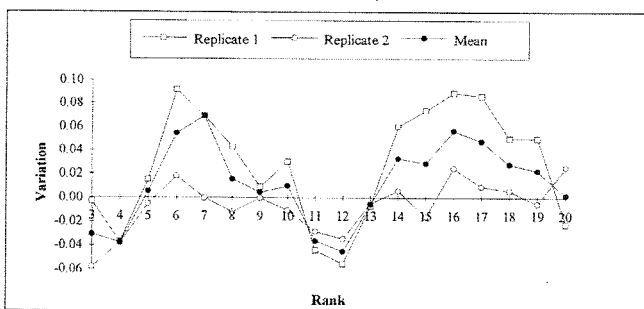


Figure 2 : Variation (in µg/g) between theoretical and observed mercury concentration, in *Posidonia oceanica* sheaths, on the basis of the insertion rank.

In the future, we plan to investigate whether the accumulation of trace metal by *Posidonia oceanica* shows significant variations according to the season. We shall therefore analyse trace metal concentrations in the various leaf tissues of *Posidonia oceanica* over an annual cycle.

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