

Memorization of heavy metals by *Posidonia oceanica* preliminary results

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The aims of this preliminary study, which is part of the European Community Commission STEP programme (STEP - 0063 - C), are the quantification of trace elements stored in the living part of the meadow (e.g. heavy metals), and an investigation of whether rhizomes and sheaths, which decay little, can provide a record of previous trace element content level, and thus provide a means of reconstituting the chronology of content level over a long period (10 to 30 years). In fact, for Cesium 137, it has been shown that rhizomes and sheaths "memorise" the content level that prevailed at the time of their original growth (CALMET *et al.*, 1988).

This study was carried out on different Mediterranean sites; these preliminary results only concern the Marseilles area (in the vicinity of the Cortiou out, station - 10 m). Three replicates of ten orthotropic rhizomes were collected at random by SCUBA diving. For each shoot, sheaths and rhizome segments were carefully detached, according to the lepidochronological method (PERGENT, 1990). For each lepidochronological year, heavy metal content in the various parts of the plant are measured by atomic absorption.

These preliminary results provide evidence of :

(i) The accumulation of various trace elements that are present in the environment by *Posidonia oceanica* according to AUGIER *et al.* (1980), CALMET *et al.* (1988) and PANAYOTIDIS *et al.* (1990),

(ii) A decrease in heavy metal content levels since 1975 (Figure 1), including iron, which gives distinctly higher values (from 931 to 175 µg/g).

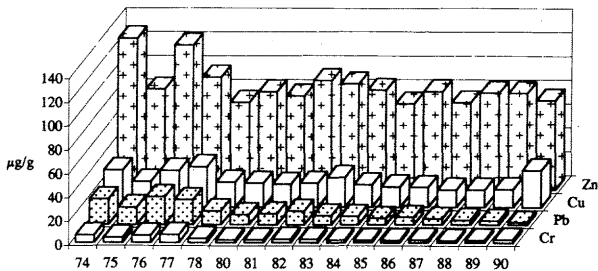


Figure 1: Heavy metal concentrations in *Posidonia oceanica* (in µg/g) en fonction de lepidochronological year.

(iii) Significant correlations between sheaths and rhizomes for lead, iron, chrome and for zinc, the correlation is negative (Figure 2).

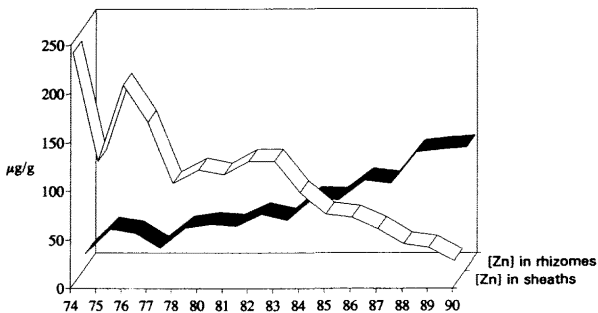


Figure 2: Zinc content (in µg/g) in *Posidonia oceanica* sheaths and rhizomes with lepidochronological year.

(iv) There are significant correlations between the lead content recorded in the water or the sediment, within the same area (c.f. Réseau National d'Observations de la Qualité du Milieu marin) and that measured in the *Posidonia oceanica* rhizomes.

Nevertheless, it would be premature at this stage to offer any interpretation of these results, which require confirmation after further analysis.

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