

Posidonia meadows reflect pollution levels in the Mediterranean

June 17 2010



The researchers sampled more than 50 *Posidonia* in the Balearics. Credit: Antonio Tovar-Sánchez et al.

"*Posidonia oceanica* can act as an environmental tracer, reflecting different levels of local and regional pollution", Antonio Tovar-Sánchez, lead author of the study and a researcher at the Global Change research department at the Mediterranean Institute for Advanced Studies (CSIC-UIB), tells SINC.

The analysis of metal levels in *Posidonia oceanica*, which has been published in the *Journal of Geophysical Research-Biogeosciences*, provided a temporary record of large scale historic environmental changes, such as atmospheric deposition events, which are increasingly frequent in the western Mediterranean as a result of global warming.

According to the researchers, the Posidonia beds are a "tool that can be used to study past environmental events, which is essential for environmental management strategies and for studying climate change", because metals (both nutritional and toxic ones) are stored in the fibres of the plants as they grow.

Tracing metals in Mallorcan waters

The scientists gathered samples from more than 50 beds of Posidonia throughout the Balearic archipelago. They carried out a chemical analysis of the plants' rhizomes (underground stalks) to identify the metals that had reached the Mediterranean over the past 30 years, traces of which are locked up in these marine plants.

The highest levels were of aluminium, cadmium, chrome, copper, lead and zinc, on the island of Mallorca. The study shows there was a fall in silver levels over this period (by more than 80% from 1990 to 2005 in Mallorca), attributed to a decline in anthropogenic sources.

Levels of nickel and zinc were the only elements that experienced an increase since 1996 over all seasons. "This is due to the atmospheric particle load in the air across the entire Mediterranean", say the scientists. Atmospheric events would also be responsible for this.

Posidonia oceánica is a very long-living plant, with its stalks living for several decades on the sea bed, forming meadows that have existed for thousands of years. It has rigid vascular structures and it covers an area totalling more than 50,000 km² across the length and breadth of the Mediterranean. These characteristics make it a "good" indicator of environmental quality, both in terms of the past and the present.

Posidonia meadows play a crucial ecological and biological role in the Mediterranean. "They are home to a wealth of biological diversity, they

provide food and refuge for numerous sea species, they produce oxygen, store CO₂ and also protect the coast from erosion, acting as natural barriers", points out Tovar-Sánchez. Posidonia meadows are legally protected by national and European legislation.

More information: Tovar-Sánchez, Antonio; Seron, Juan; Marba, Nuria; Arrieta, Jesús M.; Duarte, Carlos M. "Long-term records of trace metal content of western Mediterranean seagrass (*Posidonia oceanica*) meadows: Natural and anthropogenic contributions" *Journal of Geophysical Research-Biogeosciences* 115: G02006, 24 April 2010. [doi:10.1029/2009JG001076](https://doi.org/10.1029/2009JG001076)

Provided by FECYT - Spanish Foundation for Science and Technology

Citation: Posidonia meadows reflect pollution levels in the Mediterranean (2010, June 17) retrieved 5 May 2024 from <https://phys.org/news/2010-06-posidonia-meadows-pollution-mediterranean.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.