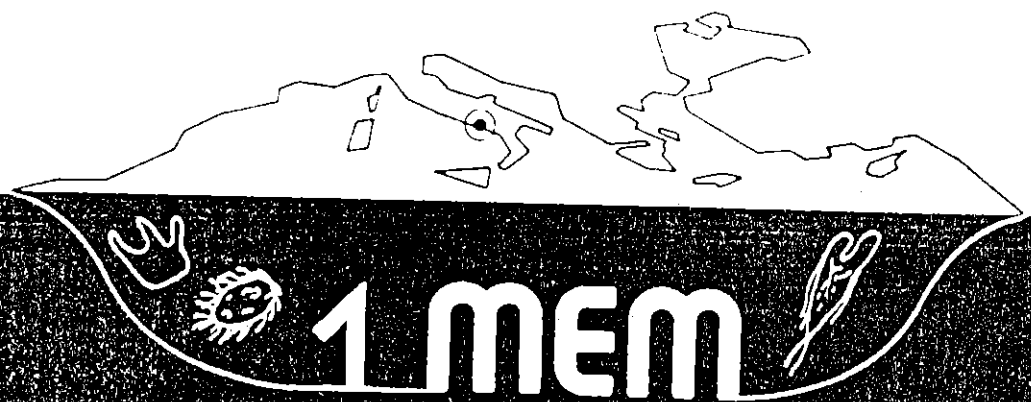


The First International Symposium on
Microbial Ecology of the Mediterranean Sea



Abstracts

**Hotel Ambasciatori
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The First International Symposium on

Microbial Ecology of the Mediterranean Sea

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BIOTRANSFORMATION OF BIS(TRIBUTYLTIN)OXIDE IN THE AQUATIC ENVIRONMENT

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In the last years the world production of organotin compounds has notably grown, exceeding 63,000 ton/y. These compounds find numerous industrial applications: catalyzers and stabilizers in the production of plastic materials, stabilizers for lubricating oils, biocides, etc. The toxicity of organotin compounds to humans is long known, but at present our knowledge about a possible impact of these compounds on the environment is not yet complete.

We studied the bis(tributyltin)oxide (TBTO), a compound having a potential wide use as a biocide in the antifouling paintings industry and constitutes a major route of diffusion into the aquatic environment.

The biotransformation of TBTO was determined in our laboratory, using a 100 litre glass tank with seawater provided with an aerator. Stock solution of TBTO was prepared on weight/volume basis by adding appropriate amounts of the chemical to acetone as a solvent. We used a concentration of 0.2 μ g/l of TBTO in seawater. Organic species and total tin concentrations present in seawater were periodically determined by GC-FPD. Furthermore, the total bacterial charge was determined both in the seawater tank containing TBTO and in another one serving as a control.

The TBTO showed a degradation rate of 50% during the first 15 days. Afterwards the degradation rate occurred so slowly that 80% of TBTO remained in the tributyltin species rather than the di- and monobutyltin species after 40 days. The bacterial population showed notable decrease during the first week and after the 40th day almost disappeared compared with the control tank.

Consequently this compound can involve a serious environmental hazard as a consequence both of quite long persistence of TBTO in the aquatic environment and the octanol-water partition coefficient ($\log.P=3.30$). These findings suggest that TBTO could be a potential source of environmental accidents, involving food chains.