

The radioactivity of some plankton and Sea water samples collected during 1960-1968 period

by

LAURA TASSI PELATI* and CESARE TRIULZI**

* Department of zoology, University, Parma (Italie)

** Laboratories C.I.S.E., Milan (Italie)

Abstract*

Since 1960 the Zoology Department of the University of Parma, in cooperation with the Radiochemistry of C.I.S.E., has been studying the radioactivity of the marine environment.

Gross beta radioactivity measured in plankton samples is useful for an immediate visualization of the environmental radioactive contamination level : trends of plankton radioactivity from both North Adriatic and Ligurian-Tyrrhenian Seas collected during the 1960-1968 period are presented in fig. 1 and 2 correlated with the same zone fallout.

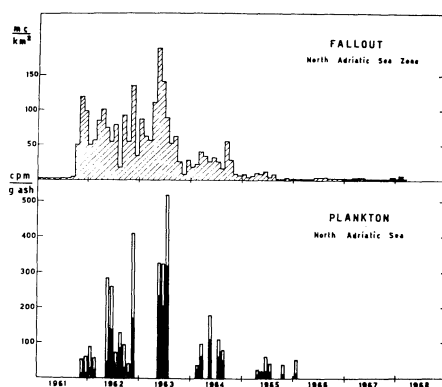


Fig. 1

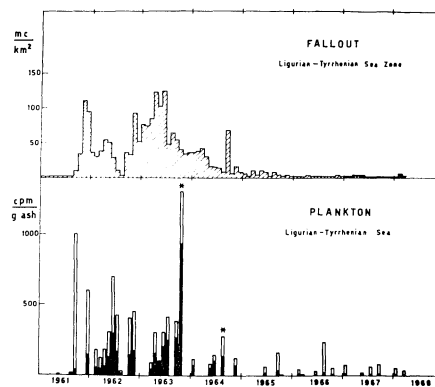


Fig. 2

Gross beta radioactivity for such samples of plankton reached its highest values in 1963, following successively the trends of the fallout debris; in 1968 the same values recorded in 1961 were reached.

By considering the gross beta decay curves of each plankton samples, it was calculated the ratio between the data measured 15 and 200 days after collection : from the values of this ratio it is possible to have an 'a posteriori' information if the marine samples were contaminated from fresh or old fission products (see fig. 3).

Beta trends of plankton contamination were confirmed by the contents of the radionuclides as Ce^{144} , Mm^{147} , Eu^{155} , Zr^{95} , Sb^{125} , Mn^{54} determined both in plankton and in sea-water samples.

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Moreover a comparison between the radioactivity values for Sr^{90} in sea-water and in plankton samples both for North Adriatic and Ligurian-Tyrrhenian Seas was made (see fig. 4). Sr^{90} contamination of sea-water is higher in the Adriatic than in the Ligurian-Tyrrhenian Seas; Sr^{90} present in Ligurian-Tyrrhenian plankton is always higher than the Adriatic one.

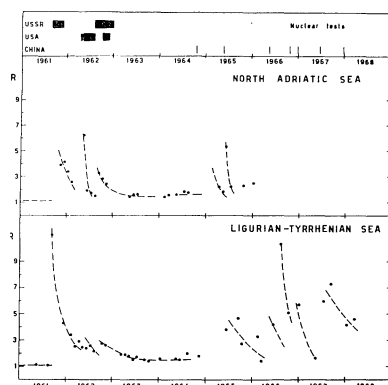


Fig. 3

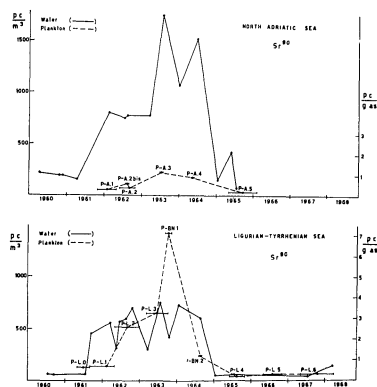


Fig. 4

As we have already reported in our previous works, plankton collections were performed in the Ligurian-Tyrrhenian Seas, where Acantharia are present, and in the North Adriatic Sea, where they are quite absent.

Values concerning the Concentration Factor for plankton samples result to be about 10 times more (average value) for Ligurian-Tyrrhenian plankton than for the Adriatic one. Obviously this fact must be correlated with the presence of Acantharia, as specific strontium accumulators.

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