Marine Pollution Bioassay by Using Sea Urchin Eggs in the Tanabe Bay, Wakayama Prefecture, Japan, 1970–1987

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The results of 18 years bioassays of the water at the Seto Marine Biological Lavoratory and around the Hatakejima island, Shirahama, Wakayama Pref., was shown according to the methods of Kobayashi's. During 1982 and 1987, very polluted water (Grade 3-5)was observed around Hatakejima island and Tsunashirazu cove in early autumn to winter. As these phenomena differed from the tendency of polluted water observed mainly in summer of each year, the presence of very polluted water mass was suggested at that time, such as containing tributyltin oxide(TBTO).

The author proposed in 1971 the use of sea urchin eggs and embryos as indicatory organisms in marine pollution bioassay and actually this was applied to the survey of the sea water pollution in the Inland Sea of Japan : Ranking I (Kobayashi et al., 1972). The method was then improved to enhance the sensitivity byusing aged eggs : Ranking II (Kobayashi, 1974). The sperm condition was taken into consideration when an improved version of the previous method (Kobayashi, 1974) was formulated, and both aged eggs and sperm were used : Ranking III(Kobayashi, 1984, 1985). By using aged eggs and sperm, the sensitivity of this method has been markedly increased.

At the Seto Marine Biological Laboratory of Kyoto university, Shirahama, Wakayama Prefecture, has started the marine pollution bioassay by sea urchin eggs in the Tanabe Bay since the spring of 1970. The Hatakejima island is the experimental field of the Laboratory, situated in Tanabe Bay, inhabited by several hundred species of tropical, subtropical and temperate-zone organisms because ofits rich topographical diversity and thus the area has been for ages one of the most important places in Japan indispensable for researches and education in the marine biology. Meanwhile, the natural environment of the vicinity has been more or less damaged by over-collecting of littoral organisms and marine pollution caused by steadily increasing sewage, reclamation of coves and crowded net-cages for fish rearing, etc.

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