THE ENVIRONMENTAL CHANGE OF HIROSHIMA BAY JUDGED BY THE USE OF ROCKY SHORE ORGANISMS AS BIOINDICATOR

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In recent years, many shallow areas of the Seto Inland Sea have been reclaimed, taking a toll on the ecosystems, and entailing a loss of many species. In addition, some of the recent reports indicate that environmental endocrine disrupters are wreaking havoc on the reproductive functions of marine organisms, including shellfish. In fact, a dramatic decrease was seen in the populations of certain shellfish species in the Seto Inland Sea. However, the ecosystem of the sea is changing rapidly, more than expected, the number of these organisms has been recovering more recently. It is a very important subject to study in order to find the primary factors of these changes for the preservation of both the ecosystem and marine resources. Therefore, the relationship between the distribution of rocky shore organisms as bioindicator and the environment around their habitat in Hiroshima Bay has been investigated using the bioassesment technique (SAMB) since 1995. The intertidal organisms were surveyed at 7 stations from the coastal zone to the center of the bay during the warm season of 1995, 2001 and 2003. In 1995, the mean value of COD, which is 2.8 mg/l along the coastal zone (St. Ujina Is.), decreases to 2.0 mg/l near the center of the bay (St. Ookurokami Is.). Crustaceans *Capitullum mitella* and shellfish *Serpulorbis imbricatus*, which were clean water bioindicators, were prevalent species found in Ookurokami Is. It's value by the bioindicators (SAMB) was 85 points. This value decreases to 25 points in U. Is.. In this station, shellfish *Mytilus galloprovincialis*, and red algae *Chondrus* spp., which were polluted water bioindicators, were dominant species. In 2001, a distribution area of these clean water bioindicators expanded, and ascidians *Styela plicata* (polluted water bioind.) whose distribution area was decreased near the coastal zone. Thus, the value by the bioindicators was improved in these areas. In 2003, *Capitullum mitella* appeared in U. Is. after a long absence, and the value was up to 44 points. There was hardly any difference in the mean value of COD at each station in this period. One of the big changes of the ecosystem on the rocky shores of Hiroshima Bay was that the population of shellfish *Tais clavigera* shifted to increase from about 1996. Therefore, dominant organisms, which were shellfish *Crassostrea gigas* and *Mytilus galloprovincialis*, were eaten by this species of Tais, and began to decrease. Furthermore, some clean water bioindicators as *Capitullum mitella* and *Serpulorbis imbricatus* progressed into the niche after the inhabitants disappeared. The major factor in the increase of the Tais was considered to be an effect of water improvement due to the use of organic tin compounds being regulated consistently since about 1990. It is suggested that the major factor of the progression of the value by the bioindicators is this water improvement.