Sustainable development concerns, indicators, sustainable development of coastal and marine resources

Macroalgae On Concrete Contained Amino Acid

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Microalgae are a primary producer in a water ecosystem, and have an important function also as fixation of carbon dioxide, the nest of fishes, and human being's food. For Japan surrounded by the sea in the four quarters, it is a serious problem that the marine forest of a neritic region decreases in recent years. Various organizations have been tackled to regrow of the marine forest in various places in Japan. An important point is how to regrow a marine forest efficiently. Arginine which is a kind of amino acid is mixed and environmentally vitalizing concrete has the function to promote growth of algae. It is checked in the experiment in Osaka Bay for two years that the growth speed of the algae accelerated 5 to 10 times with Arginine. Moreover, the algae which grew thick on concrete were Chlorophyceae, Diatoms, and Sargassum horneri. This experiment proved that Arginine has the function to promote growth of Microalgae. However, there is no telling whether other amino acid has the same effect. Then, we experimented in whether amino acid other than Arginine has an effect which growth of microalgae promotes. We chose Sargassum horneri and Rhodophyceae as microalgae. These are widely distributed over every place in Japan, and are grown ordinarily also to an inner bay. Sargassum horneri is not only nest of fish and shellfishes but edible materials. And we have been used Gelidium elegans as a material of agar. We chose Arginine, Lysine, and Sodium Glutamate Acid as amino acid added to concrete. An ordinary concrete was put on the conditions as comparative data. Each amino acids of the quantity equivalent to 1% of nitrogen concentration is contained in concrete. We put the ripe alga of Gelidium elegans and embryo of Sargassum horneri on the concrete. These were sunk into the sea water tub and the growth situation of seaweed was observed periodically. Sargassum horneri on the concrete showed rapid growth in one month after the start of test. About growth of Sargassum horneri, the ordinary concrete was as same as Arginine concrete, but Lysine and Sodium Glutamate Acid concrete were less than the ordinary concrete and Arginine concrete. 2month after, Arginine concrete surface was covered with other algae than Sargassum horneri. About growth of Gelidium elegans, the alga grew mostly on a Sodium Glutamate Acid concrete. Because, others algae which were carried in from sea water on concrete grew preferentially than Gelidium elegans .Therefore, Gelidium

elegans on the Sodium Glutamate Acid concrete with few other algae showed good growth. Thus, the concrete which added amino acid is expectable in early growth of macroalgae. However, when putting the concrete in which was added Arginine which shows a good effect of growth to any algae, it is necessary to choose the season to put. In doing so, by using proper amino acid to the target microalgae, a marine forest would be developed at an early stage.