

New Trends of Marine Biotechnology Development

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For the last 15-20 years marine animals and plants have attracted the particular attention of scientists from many countries. Institutes and Centres of marine biotechnology, special departments and laboratories at Universities have been organized in Japan and America. The Pacific Institute of Bioorganic Chemistry (PIBC) located in Vladivostok has become such a Centre of marine biochemistry and biotechnology in Russia.

Intensive studies on marine low molecular weight bioregulators (isoprenoids, quinoids, alkaloids and others) and biopolymers (poly- and oligosaccharides, peptides) are under way at PIBC. Chemical structures of many "marine" compounds have been elucidated. Correlation between chemical structure and biological functions has been cleared up.

To apply successfully all the compounds obtained for medicine and agriculture, reliable resources of raw materials are of paramount importance. The most promising trend of marine biotechnology is employment of marine microorganisms for producing biologically active substances. The collection of symbiotic and free-living marine microorganisms (KMM) has been created at PIBC. It contains more than 8000 strains of bacteria, actinomycetes and fungi. Possibilities for cultivation of some of them are discussing now.

Another way to develop marine biotechnology is to use wastes of fishing industry. Some examples of the waste utilization to produce useful compounds (enzymes, polysaccharides) are given in the report.

Marine biotechnology can also use methods of genetic engineering and total chemical synthesis. So, a natural antioxidant, echinochrom, was synthesized in six stages at PIBC. Echinochrom is a basic component for producing effective cardioprotector, histochrom. Fascoplysin, antimicrobial and cytotoxic red pigment of the sponge *Fascaplysinopsis sp.*, was obtained by five-step synthesis from tryptamine.