Bioactive marine metabolites from Okinawan waters -Compounds which inhibit the development of sea urchin embryos-

PS-18 **Bioactive marine metabolites from Okinawan waters -Compounds which inhibit the development of sea urchin embryos-**

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Okinawa is Japan's southernmost prefecture, and consists of hundreds of islands known as the Ryukyus, in an island chain over 1000 km long, which extends southwest from Kyusyu (the southwesternmost of Japan's main four islands) to Taiwan. The warm waters of the Kuroshio Current have developed and sustained the coral reefs of Okinawa, which are among biologically the most diverse and the richest coral reefs in the world.

Biotic stress factors due to predation are usually severe in coral reefs whose biota is characterized by rich and diverse fauna and flora. Many of sessile organisms such as sponges, ascidians, soft corals, etc. have had toxins and noxious compounds to protect themselves from the predators. These bioactive secondary metabolites may be important sources for natural products based drugs and medicines.

The fertilized sea urchin egg assay is useful because the assay can detect such selective agents as microtubule assembly inhibitors, DNA synthesis inhibitors, RNA synthesis inhibitors and protein synthesis inhibitors, and it can be also performed easily.[1), 2)] A number of chemically and biologically interesting marine natural products have been isolated by the technique of this bioassay so far.

As part of our continuing chemical investigation of Okinawan marine invertebrates, we examined the constituents of three unidentified sponges whose crude EtOAc extracts displayed inhibition of the cell division of fertilized sea urchin eggs. Bioassay- and NMR –guided fractionation of the extract of a sponge from Kume Island led to the isolation of a series of polyoxygenated steroids. These compounds arrested the development of sea urchin embryos at the concentration of 3 to 5 ppm. The known agosterol C induced lack of forward movement of free-swimming embryos after hatching and caused rapid spinning of the embryos, which showed that agosterol C should be a tubulin modulator. An unidentified sponge collected in Hateruma Island gave five sesquiterpenoid quinones that showed cytotoxities against the fertilized sea urchin eggs or HCT116 cancer cells. A yellow sponge from Hateruma Island whose EtOAc extract inhibited cell division of fertilized sea urchin eggs contained toxic nitrogenous sesquiterpenes.

In this meeting we will present the isolation, structure determination and activities of the secondary metabolites from the Okinawan marine sponges.

References

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