

Antiradical Activity of Alkaloids from Marine Sponges

Aleksandra E. Makarchenko^a, Natalia K. Utkina^b

^aFar Eastern State University, Oktiabrskaya street, 27, 690600, Vladivostok, Russia

^bPacific Institute of Bioorganic Chemistry, FEBRAS,

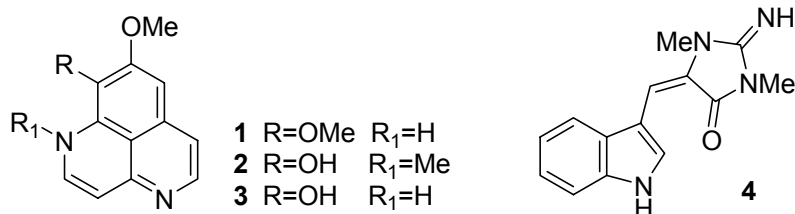
pr. Stoletia, 159, 690022, Vladivostok, Russia

Fax: (4232) 314050

E-mail: aleksandra_makar@mail.ru

Oxidative damage induced by reactive oxygen species causes a variety of human diseases. Antioxidants with free radical scavenging activities play an important role in the prevention and therapy of these diseases.

Marine sponges are a promising source of secondary metabolites showing a wide range of biological activities. In the course of our search for antioxidants from marine sponges, we have isolated 1,6-naphthyridin alkaloids **1-3** from a Vietnamese marine sponge *Aptos* sp. and indole alkaloid **4** from an Australian marine sponge of the genus *Aplysinopsis*. Isolated sponge metabolites aaptamine (**1**), iso-aaptamine (**2**), demethylaaptamine (**3**) and aplysinopsin (**4**) were tested for their ability to scavenge the stable free 1,1-diphenyl-2-picrylhydrazyl radical (DPPH) and hydroxyl radicals (OH[•]) forming in Fenton reaction.



Compounds **1-4** exhibited the potent antiradical activity in DPPH scavenging (IC₅₀: 5,63; 2,50; 1,25; 1,02 μM, respectively) and in OH[•] scavenging (IC₅₀ 5.1; 1.5; 1.3; 1.02 μM, respectively). It was shown that antiradical activities of aaptamines depend on number and the position of a hydroxyl group.

We studied UV-stability and UV-screening properties of **1-4**. The test on UV-stability showed, that all metabolites were UV-stable in 2 h and adsorbed UV-B radiation.

This research was supported by grants 03-04-49515 (RFBR), The program of the Presidium of Russian Academy of Sciences "Molecular and Cell Biology", IIII-725.2003.4 (President of the Russian Federation), and by Far Eastern State University.