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Antioxidant quinonoid pigments from coelomic fluid of Far Eastern sea urchins

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The coelomic fluid of the sea urchin contains cells, generically called coelomocytes, that have been studied for many decades. Due to their capability to respond to injuries, host invasion, and cytotoxic agents, coelomocytes are regarded as the immune effectors of the sea urchin. One of the subpopulations of coelomocytes are spherical cells with red cytoplasmic granules. In 1885 MacMunn isolated the red pigment from the coelomic fluid of *Echinus esculentus* and called it echinochrome A. Since that there is an opinion, that coelomic fluid of sea urchins contains echinochrome A regardless from their species. We investigated for the first time the composition of quinonoid pigments from coelomic fluid of eight sea urchin species of the Sea of Japan and the Sea of Okhotsk (*Strongylocentrotus intermedius*, *St. pallidus*, *St. droebachiensis*, *St. polyacanthus*, *Mesocentrotus nudus*, *Echinocardium cordatum*, *Scaphechinus mirabilis*, *Echinarachnius parma*) using HPLC-DAD-MS. We discovered that composition of coelomic fluid pigments differs between the species and includes all known naphthoquinones of sea urchins (echinochrome A, spinochromes A-E, binaphthoquinones) and some new compounds. Main coelomic fluid pigments were isolated previously from shells and spines of sea urchins *M. nudus* and *Sc. mirabilis* and were tested for their ability to scavenge the stable DPPH radical and to inhibit lipid peroxidation. Echinochrome A, spinochromes C and E showed the highest antioxidant activity on both models. The study of antioxidant activity of quinonoid pigments was supported by the Grant No. 16-33-00297 mol_a from Russian Foundation for Basic Research.

Biography

Vasileva Elena is a graduate student in the Laboratory of Natural Quinonoid Compounds of G. B. Elyakov Pacific Institute of Bioorganic Chemistry (Vladivostok, Russia).

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