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Serotonin and dopamine in the nervous system and gonads of the sea cucumber during reproductive cycle, and their possible applications in aquaculture

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Serotonin (5-HT) and dopamine (DA) are major neurotransmitters that have been reported extensively to play physiological processes in both vertebrates and invertebrates. In the present study, the distribution and dynamic expression of 5-HT and DA in the central nervous system (CNS) and gonads of the sea cucumber *Holothuria scabra* during gonadal development cycle have not yet been reported. Therefore, the aims of this study were to investigate the existence and expression of these neurotransmitters in the CNS and gonads in various stages of ovarian cycles. 5-HT-immunoreactivity (-ir) was more intense in the neurons and neuropils of neural parts of ventral nerve cord in late stages, whereas DA-ir was detected at high intensity at the early stages. In the ovary, high 5-HT intensity was present in the late oocyte stages, while DA-ir showed high intensity in early oocyte stages. The changes in the levels of the 5-HT in the neural tissues are coincident with changes in the ovarian tissue levels. In contrast, DA concentrations in the nervous tissues and oocytes were more intense and decrease in late stages. These findings suggest that the presence and distribution of 5-HT and DA may be involved in modulation of the reproductive process, including development of oocytes in this species, and this work provides important point of view of these major neurotransmitters in possible applications in sea cucumber aquaculture.

Biography

Arada Chaiyamoon is a PhD candidate, from the Department of Anatomy, Faculty of Science, Mahidol University, Thailand. Her researh area focuses on endocrinology of the sea cucumber and possible applications in aquaculture.

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