DOI: 10.46991/JISEES.2025.SI1.119

# Serotonergic System in the Eye of *Pomacea Canaliculata*

Irina N. Dominova*, Valeria V. Kotova, Viktoria A. Kalinina, Valery V. Zhukov

Institute of Medicine and Life Sciences (MEDBIO), Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation

## ABSTRACT

The presence of 5-HT and its receptors (5-HTR) is found in the retina of both invertebrate and vertebrate animals. While several types of 5-HTR have been found in the vertebrate retina, their identification in the gastropod's retina has not yet been accomplished. The latter is despite the fact that serotoninergic innervation of the eye of these molluscs has been shown. Previously we've shown the presence of 5-HT-immunoreactive structures in close vicinity of the retina in freshwater gastropod *Pomacea canaliculata*. Moreover 5-HTR genes transcripts (*XM_025238755.1*, *XM_025238614.1*, *XM_025223758.1*) were identified in the mollusc eyes, although their relative transcription levels (RTL) were significantly downregulated compared to the central ganglia. Transcription of the 5-HT transporter (XM_025237076.1) gene was recorded as well. The present study focuses on the 5-HT quantification and transcript identification of tryptophan hydroxylase (TPH) and aromatic L-amino acid decarboxylase (AADC) genes in *P.canalicilata*. As result TPH (XM_025243266.1) and AADC (XM_025258217.1) transcripts were identified in eye and central ganglia of mollusc. The RTL of TPH was higher in eye compared to central ganglia. Whereas AADC showed the opposite pattern. HPLC showed a higher 5-HT concentration in the central ganglia compared to the eyes. The obtained results strengh the opinion about serotoninergic modulation of the retina in *P.canaliculata*.

**Keywords:** serotonin, gastropods, eye, gene expression

## References:

1. Masson, J. Serotonin in retina. *Biochimie* **2019,** *161*, 51–55. DOI:10.1016/j.biochi. 2018.11.006
2. Zhukov, V.V. On the problem of retinal transmitters of the freshwater mollusc *Lymnaea stagnalis. J. Evol. Biochem. Physiol.* **2007**, *43*, 524–532. DOI:10.1134/S0022093007050118
3. Dominova, I.N.; et al. Some Components of the Serotonergic System in the Eyes of Two Species of Freshwater Molluscs. *J. Evol. Biochem. Physiol.* **2023,** *59*, 1954–1965. DOI:10.1134/S0022093023060054

## *Corresponding Author:

Irina N. Dominova, Institute of Medicine and Life Sciences (MEDBIO), Immanuel Kant Baltic Federal University, 2 Universitetskaya str., Kaliningrad, 236040, Russian Federation.
Email: irinadominova@gmail.com