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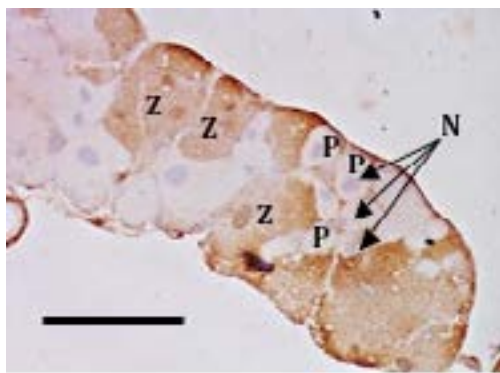
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Regulations of serotonin and dopamine in the salivary glands of the red palm weevil, *Rhynchophorus ferrugineus* (Coleoptera: Dryophthoridae) during feeding and starvation

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Statement of the Problem: *Rhynchophorus ferrugineus* or Red Palm Weevil (RPW) is the important pest for Palmaceae plants. However, there is no effective way to control its infestations as it only shows symptom until the late stage of infestation where the plant could not survive anymore. Fundamental studies need to be done to understand its physiology so that it can be applied to control this pest by targeting its biological system. Serotonin (5-HT) and dopamine (DA) has been known as potent biogenic amines that control the physiological events in the insect. Methodology & Theoretical Orientation: This study focuses on its important feeding organs that is salivary gland where the role of 5-HT and DA in the regulations of salivary gland of RPW during feeding and starvation of 24h, 48h and 72h were determined. Samples were collected from infested coconut plantation in Terengganu state Malaysia and were reared in the lab. Immunohistochemical (IHC) analysis was done to determine the distribution of these amines in the salivary glands while enzyme-linked immunosorbent assay (ELISA) was conducted to quantify these amines during different feeding status. Findings: IHC staining had indicated that 5-HT and DA are positively present within cells of the salivary gland where 5-HT is more dominant on zymogenic cells while DA stained mostly on parietal cells. The IHC stained were more intense in salivary tissues for a longer period of starvation (72h) suggesting that these biogenic amines also regulate the glands during the non-feeding period. From the ELISA assays, the level of 5-HT and DA increased significantly during the starvation period (72h) ($p < 0.05$) where the 5-HT level was increased dramatically compared to DA. Conclusion & Significance: Further work is necessary to understand the agonistic and antagonistic role of these amines in controlling the feeding of RPW that can be manipulated in future by targeting its pathway for the development of bio-pesticide.



Recent Publications

1. Nurul Wahida, O., Nur Hudawiyah, A., Roslim, R., Nur Khairunnisa, S., Norela, S, (2018) Mouthpart and digestive tract morphology of the synchronized firefly, *Pteroptyx tener* (Coleoptera: Lampyridae), Serangga. 23(2): 170-182

2. Maizom Hassan, Norazila Yusoff, Wan Mohd Aizat, Nurul Wahida Othman & Idris Abd Ghani (2018) Optimization method for proteomic analysis of the larva and adult tissues of *Plutella xylostella* (L.) (Lepidoptera: Plutellidae), *Sains Malaysiana*. 47(12): 2975-2983
3. Farah Nadiyah R., Norefrina Shafinaz M.N. and Nurul Wahida O., (2018) Preliminary study on gut bacterial abundance in *Rhynchophorus ferrugineus* (Coleoptera: Dryophthoridae) fed on different diets. *Serangga*. 23(1): 126-138
4. Muhamad Azmi Mohammed, Ameyra Aman-Zuki, Nurul Othman Wahida, Yohsuke Tagami, Salmah Yaakop (2018) The role of a novel *Wolbachia* (Rickettsiales: Anaplasmataceae) synthetic peptide, WolFar, in regulating prostaglandin levels in the hemolymph of *Acheta domesticus* (Orthoptera: Gryllidae). *Turkish Journal of Zoology*. 42(4): 422-431
5. Wan Nurul 'Ain Wan Mohd Nor, Nurul Wahida Othman, Salmah Yaakop, Norefrina Shafinaz Md Nor, (2018) Morphology and histology of reproductive organ and first screening of *Wolbachia* in the ovary of red palm weevil, *Rhynchophorus ferrugineus* (Coleoptera: Dryophthoridae), *Serangga*. 23(2): 183-193

Biography

Nurul Wahida Othman received her PhD from Australian National University, Canberra in 2013. She is currently a Senior Lecturer in Universiti Kebangsaan Malaysia (UKM) and Head of the Centre for Insect Systematics (CIS), UKM. She has more than 30 publications ranging from journal articles, proceedings and chapters in book since she started her academic career in UKM. She also actively presented her work at a few international and local seminars and conferences. Her research interest is on insect physiology that focused on the anatomy, histology and regulations of the digestive, nervous and reproduction system of pest insects and aesthetics insects.

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