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Variation the oviposition behavior by the stingless bee, *Heterotrigona itama* (Hymenoptera, Apidae, Meliponini)

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**Variation the oviposition behavior by the stingless bee, *Heterotrigona itama* (Hymenoptera, Apidae, Meliponini)****Fahimee J<sup>1,2</sup>, Nursyazwani N<sup>1</sup>, Fairuz K<sup>3</sup>, Rosliza J<sup>1</sup>, MR Mispan<sup>1</sup>, Idris A.G<sup>2</sup>**<sup>1</sup> Agrobiodiversity and Environmental Research Centre, MARDI Headquarters, 43400 Serdang Selangor.<sup>2</sup> Centre of Insect Systematics, National University of Malaysia, 43600 Bangi, Selangor<sup>3</sup> Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA, Melaka Branch, Jasin Campus, 77300 Merlimau, Melaka, Malaysia.**Corresponding author**

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**Abstract**

A study to determine the variation of ovipositioning behavior of stingless bees, *Heterotrigona itama* (Cockerell, 1918) was conducted on three colonies on June 2015. A digital single-lens reflex (DSLR) camera with a macro lens attached was used to record every movement of *H. itama* in its colonies for 20 min hour between 0800h and 2000h for seven days and seven month. The daily egg laying rate and time for laying eggs in colony-B and colony-C were significantly ( $P < 0.05$ ) higher than the colony-A. However, time to close the brood was not significantly different among colonies. The fastest egg oviposition time was 4 seconds by the colony-B and the slowest was 6 seconds by the colony-A. In addition there are no significant trends on brood produced per day, laying time of eggs, and the closing time of the brood after the oviposition process from June to December 2016. This result is useful for understanding the behavior of egg laying process by the queen bees and necessary to deal with problems of management and reproduction in the near future.

**Keywords:** *Heterotrigona itama*, Queen bees, Oviposition, Apidae**Introduction**

Ovipositioning behavior is a process of laying eggs by a queen bee (Sakagami et al., 1965; Veen, 2000). There are six phases in the oviposition process namely prefixation, fixation, provisioning, patrolling, oviposition and cell operculation (Sakagami & Zucchi, 1974). The process of ovipositioning starts with worker bees are constructing a brood cell and depositing larval food. After that, a queen bee lays an egg in the brood cell, before the cell is closed back by worker bees (Drumond et al., 1999; Sakagami & Zucchi, 1967). In other sides, this behaviour was called provisioning and ovipositioning process and can be divided into two types of behaviour namely successive and synchronous (Zucchi R et al., 1999). Successive is a continuous process by workers to develop the brood cells in a various stages. Therefore, the queen will oviposit the egg all the time. While the synchronous is a process by the workers to

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