

**FORAGING DISTANCE IN THE STINGLESS BEE *Trigona thoracica***

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The foraging patterns of stingless bees are dependent on resource availability. Human alterations to natural areas will affect the condition of local habitats, and influence the bees' foraging behavior. In this study, we assessed the familiarity of *Trigona thoracica* with two distinct habitats. This study investigates the familiarity of the stingless bee *Trigona thoracica* with two distinct habitats. It has the dual purpose of comparing foraging distance between the intact forest and disturbed environments, and of evaluating the idea that bees create memory patterns for navigational purposes en route to destinations. We hypothesized that bees forage more frequently in the natural environment than in the disturbed environment, and are therefore more familiar with forested terrain. We also suspect that bees are able to form a visual memory in transport, and that they will integrate cues they acquire in transition to guide themselves home from unfamiliar locations. We selected a (medium-sized) colony of *Trigona thoracica* at the base of a *Ficus microcarpa* tree near the entrance to the Khao Chong Peninsular Botanic Gardens. The nest was located in a relatively open area, adjacent to two distinct environments: a densely wooded forest to the east and an altered, semi-natural environment along a highway to the west. One transect line was placed in each of these two areas, and three release points along the transects were determined using GPS (East – Forest area: 350, 650, 1200m; West - Highway: 400, 800, 1200m).

Outgoing bees were collected in plastic bags and tagged with paint markers. Collections ranging in size from sixteen to seventy bees were then transported in an insect cage to designated release points either on foot or on motorbike. At each location, two samples (covered and uncovered) were released at staggered times. The two transects were completed over the course of three days, with a total of twelve releases. On each day we had similar sunny and dry weather conditions. On each day, the nest was observed from the first release to at least 1.25 hours after the last release; the activity of marked bees (entering or exiting the hive) was recorded, as well as the time of that activity. Percentage returns were calculated for each batch of marked bees released from each of the three releasing points on each transect, according to the recorded number of returns for each batch.

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There was no significant difference between the number of covered and uncovered bees that returned. This leads us to believe that the bees do not form memory when they are artificially transported, which may be due to factors, which differ between artificial transport and normal flight behavior. Possible factors include the rate of movement, and the height of travel. Additionally, the mesh-and-plastic carrying cage may have skewed the bee's exposure to sunlight and added an abnormal level of stress for the bee, altering the bee's ability to assess the solar pattern. These factors would contribute to the bee's incapacity to use egocentric methods for homeward navigation. We found that the bees are more familiar with the natural habitat than the disturbed habitat. The forage distance was determined to be 3.676 km in the forested area and 1.973 km along the highway.