**Evaluating nest site exploration by termite mating pairs using posture tracking**

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**Abstract**

**Introduction**

1. Termite: mating pair as an important unit to think about pest management. However, termites damage human property when they are in the mature colony, so less attention has been paid to mating partner. However, even though the mature colony is millions of indiviudals, all colonies need to start from a mating pair (with a few exceptions).

About termite tandem running. It is a critical life stage for colony establishments, biological invasion, and pest management. But this is not well appreciated.

2. mate pairing termites. how far they can go? Answer question C. formosanus how far they can go after attracted by light trap?

I study tandem running behavior of a termite.

Here I estimate how much tandem running pair can walk to look for nest site.

Here I summarize and reanalyze all published information about tandem running behavior in pest termite species (Reticulitermes speratus, Coptotermes formosanus, Coptotermes gestroi). Based on the data, I modeled their movement patterns to simulate how much they can disperse over time and how termites encounter partners. I also evaluated the effects of light trapping on their encounter process and colony foundation.

3. Mizumoto and Dobata 2019 evaluated searching strategies. They use body center. Current advancement in posture tracking this last 10 years.

4. In this study

Methods

Behavioral data

I used the videos obtained in a previous study.

Experiments with C. formosanus and R. speratus were performed as part of a study on sexually dimorphic movements of termites during mate search (Mizumoto and Dobata, 2019). Alates from 2 colonies of C. formosanus were collected in Wakayama, Japan, in June 2017; alates from 5 colonies of R. speratus were collected in Kyoto, Japan, in May 2017. After controlled nuptial flight experiments, termites that shed their wings were selected and used for tandem run experiments. Experiments were performed in a Petri dish (145 mm Ø) filled with moistened plaster whose surface was scraped before each trial. A female and a male termite were introduced in the experimental arena with the opportunity to tandem run for up to 1 hr. A total of 17 experiments were performed for C. formosanus and 20 experiments for R. speratus using different individuals. Tandem runs were recorded at 30 frames per second using a video camera with a resolution of 640 by 480 pixels.

Ideas

Fig. 1

**Acknowledgments**

Thank you for nomination.

HATCH project number.

**References**