

SURVEY on DIVERSITY of STRUCTURE-INFESTING PEST ANTS and THEIR PEST STATUS in MALAYSIA

Chow-Yang Lee, Julie Pei-Siew Na¹, and Leng-Choy Lee²

Urban Entomology Laboratory, Vector Control Research Unit, School of Biological Sciences, Universiti Sains Malaysia, 11800 Penang, Malaysia

¹Current address: Flick Pest Control Sdn Bhd (M), Johor Bahru, Johor, Malaysia

²Current address: Dow AgroSciences Asia, Petaling Jaya, Selangor, Malaysia

INTRODUCTION

Structure-infesting ants are an important group of insect pests in many parts of the world, particularly in residential premises, food outlets, and factories. In Malaysia, it is gradually becoming a major problem especially in urban settings (Lee et al., 1999; Lee and Robinson, 2001). Currently, ant control constitutes about 10-15% of the total business turnover of the pest control industry in Malaysia. Problems associated with ant infestations include food contamination, stings, bites, allergies and contamination of surgical instruments in hospitals.

Information on species composition and correct identification of structure-infesting ants are essential to better planning of an integrated control programme against these pests, because different ant species often exhibit varying behavioural characteristics as well as different feeding preferences. In addition, knowledge about homeowners' perceptions of ant infestation is also important. Despite that, little is known about the species composition of structure-infesting ants in Malaysia. In this study, we surveyed the diversity of structure-infesting pest ants, species compositions, and their pest status.

MATERIALS and METHODS

A total of 256 houses were surveyed in this study, which consisted of various types of residential structures from urban to rural areas in Penang Island, Malaysia. The index card method was used in the survey (Lee, 2000). It is essentially a 6 x 7 cm ruled card, baited with peanut butter (21.5% protein and 23.8% fat) and honey (75% carbohydrate). A total of five index cards were placed in locations within the premises where ant trails were sighted, or where ants were suspected to be nesting. In addition, a short questionnaire survey was also conducted by interviewing the homeowners on their perceptions of household ant infestation. About 40 minutes after placement of index cards, the ants found foraging on the index cards were collected and brought back to the laboratory for identification. They were examined under a dissecting scope and identified.

RESULTS and DISCUSSION

A total of 24,479 ants were collected covering 16 species in 11 genera. *Anoplolepis*, *Camponotus*, *Dolichoderus*, *Monomorium*, *Odontoponera*, *Prenoleopis*, *Paratrechina*, *Pheidole*, *Solenopsis*, *Tapinoma*, and *Tetramorium* were found in and around the structures surveyed (Table 1). The diversity of pest ants in suburban areas was higher than that of those from urban and rural areas, with higher richness and evenness indices.

Table 1. Species composition of structure-infesting ants in Malaysia (n = 24479)

Species	% of total collection	Species	% of total collection
<i>Anoplolepis longipes</i>	0.4	<i>Prenolepis imparis</i>	0.2
<i>Camponotus</i> sp.	< 0.1	<i>Paratrechina longicornis</i>	4.9
<i>Dolichoderus bituberculata</i>	0.1	<i>Pheidole</i> sp.	37.3
<i>Monomorium destructor</i>	6.0	<i>Solenopsis geminata</i>	0.1
<i>Monomorium floricola</i>	3.0	<i>Solenopsis invicta</i>	1.9
<i>Monomorium minimum</i>	2.0	<i>Tapinomamelanocephalum</i>	30.8
<i>Monomorium pharaonis</i>	4.4	<i>Tapinoma indicum</i>	8.9
<i>Odontoponera</i> sp.	< 0.1	<i>Tetramorium</i> sp.	0.1

Many ant species trapped in this study are tramp species that are of cosmopolitan distribution. These included *Monomorium* spp., *Paratrechina longicornis*, *Tapinoma* spp., *Pheidole megacephala*, and *Anoplolepis longipes*. Tramp ants are defined as ants that are polygynous, unicolonial, reproduce by budding, are largely dispersed worldwide through human commerce, live in close association with humans, and exhibit great ability for nest changes (Holldobler and Wilson, 1990; Passera, 1994). Nesting in unstable habitats in the human environment requires frequent migration; thus migration becomes a unique characteristic of tramp ant species (Passera, 1994).

The questionnaire survey revealed that mosquitoes were the most important insect pests (49%), followed by ants (16%), flies (14%), termites (12%), and cockroaches (9%). Ants were considered as a more important pest than mosquitoes among the respondents from the urban and suburban areas. A total of 62% of the respondents responded that ant trails are a daily problem in their houses. We also found that most respondents had a relatively low level of tolerance to ants, but often resorted to wrong or impractical methods of ant control. The majority of the respondents were not aware of the availability of baits for ant control.

REFERENCES

- Holldobler, B., and Wilson, E.O. 1990. *The Ants*. Cambridge: Harvard University Press.
- Lee, C.Y. 2000. Performance of hydramethylnon- and fipronil-based containerized baits against household ants in residential premises. *Trop. Biomed.* 17: 45-48.
- Lee, C.Y., and Robinson, W.H. 2001. *Handbook of Malaysian Household and Structural Pests*. Kuala Lumpur: Pest Control Association of Malaysia.
- Lee, C.Y., Yap, H.H., Chong, N.L., and Jaal, Z. 1999. *Urban Pest Control – A Malaysian Perspective*. Penang: Universiti Sains Malaysia Press.
- Passera, L. 1994. Characteristics of tramp species. Pp. 23-43 in: Williams, D.F., ed. *Exotic ants – Biology, impact, and control of introduced species*. Boulder: Westview Press.