SHORT COMMUNICATION

A STUDY ON DOMICILIARY COCKROACH INFESTATION IN PENANG, MALAYSIA

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Abstrak: Satu kajian ringkas terhadap infestasi lipas domestik dijalankan di empat lokasi di Pulau Pinang, iaitu, Lebuh Chulia dan Jalan Dato Keramat (28), Ujung Batu (24), Taman Permai dan Taman Pekaka, Jalan Sungai Dua (20) dan Kampung Paya, Teluk Kumbar (20). Empat spesies lipas dijumpai dan dicamkan dengan kadar kelimpahan berikut: *Periplaneta americana* (84.3%), *P. brunnea* 9.9%), *Supella longipalpa* (2.4%), *P. australasiae* (1.6%), *Neostylopyga rhombifolia* (1.6%) dan *Nauphoeta cinerea* (0.3%). Kawasan bandar (Lebuh Chulia dan Jalan Dato Keramat) mempunyai kadar infestasi yang tertinggi dengan 92.9% isirumahnya positif dengan lipas, manakala Kampung Paya, suatu kawasan luar bandar, mempunyai kadar infestasi yang terendah (70.0%). Tiada perbezaan yang signifikan didapati dari segi bilangan lipas per isirumah yang positif dalam keempat-empat lokasi tersebut.

Abstract: A short study on domiciliary cockroach infestation was carried out in four locations in Penang, viz., Chulia Street and Dato Keramat Road (28), Ujung Batu (24), Taman Permai and Taman Pekaka, Jalan Sungai Dua (20) and Kampung Paya, Teluk Kumbar (20). Six cockroach species were collected and identified with the following rate of abundance: *Periplaneta americana* (84.3%), *P. brunnea* (9.9%), *Supella longipalpa* (2.4%), *P. australasiae* (1.6%), *Neostylopyga rhombifolia* (1.6%) and *Nauphoeta cinerea* (0.3%). The urban area (Chulia Street and Dato Keramat Road) studied had the highest infestation rate with 92.9% of household positive with cockroaches whereas Kampung Paya, a rural setting, had the lowest infestation rate (70.0%). There was no significant difference in terms of the number of cockroaches per infested household caught in the four locations.

The importance of cockroaches as domiciliary pests is gaining widespread public attention in Malaysia. Yap and Foo (1984) have reported that the cockroach is the most important domiciliary pest after mosquitoes.

Basic studies on cockroaches in Malaysia especially on species composition, ecology and bionomics are still lacking. To date, only two studies on the species composition of cockroaches in Malaysia have been published, investigating the situation in Kelang, Selangor (Oothuman *et al* 1984) and in Penang (Yap *et al* 1991).

This paper constitutes a follow-up of the previous study by Yap *et al* (1991) after a five-year break.

In this study, 92 houses were sampled from four different locations in Penang, viz., Chulia Street and Dato Keramat Road (28 houses), Ujung Batu, Butterworth (24 houses), Taman Permai and Taman Pekaka, Jalan Sungai Dua (20 houses) and Kampung Paya, Teluk Kumbar (20 houses).

A sticky trap (TRAP A ROACH HOY HOY) baited with rat pellet (Gold Coin 702P) was used as the sampling technique (Lee 1993, Lee *et al* 1993). In this study, a trap was placed under the stove of every house for 48 hours, after which the traps were collected. The cockroaches trapped were counted and subsequently identified according to the taxonomic keys in Cochran *et al* (1975).

Table 1 shows the cockroach species composition found in this study. Six species of cockroaches were found with the following prevalence rates: *Periplaneta americana* (84.3%), *P. brunnea* (9.9%), *Supella longipalpa* (2.4%), *P. australasiae* (1.6%), *Neostylopyga rhombifolia* (1.6%) and *Nauphoeta cinerea* (0.3%). The area around Chulia Street and Dato Keramat Road had the highest infestation with 92.9% of household studied being positive with cockroaches (Table 2). On the other hand, Kampung Paya had the lowest cockroach infestation (70.0%). There was no significant difference in terms of the number of cockroaches caught in the four locations.

In this study, the American cockroach (*P. americana*) was found to be the most dominant. This concurs with the findings of Oothuman *et al* (1984) and Yap *et al* (1991). Generally, there are several factors that contribute to the success of this cockroach. It has the shortest ootheca incubation period among the six species found, as well as having the highest number of ootheca per female per lifespan and the highest survival ability when food and water are not provided (Willis & Lewis 1957, Cornwell 1968).

Table 1: Cockroaches species composition and number of cockroaches per household in four locations in Penang, Malaysia. [1]

Species	No. of cockroaches trapped at each location (no. of household sampled) [2,3]				
	Chulia Street & Dato Keramat Road (28)	Kampung Paya in Teluk Kumbar (20)	Ujung Batu (24)	Taman Permai & Taman Pekaka (20)	Total (%)
Periplaneta americana	79	45	112	80	316 (84.3)
P. brunnea	3	24	4	6	37 (9.9)
P. australasiae	0	6	0	0	6 (1.6)
Neostylopyga rhombifolia	2	0	4	0	6 (1.6)
Supella longipalpa	7	0	0	2	9 (2.4)
Nauphoeta cinerea	1	0	0	0	1 (0.3)
Total per location	92	75	120	88	375
No. per positive household ± S E	3.54±0.71	5.36±1.01	5.45±0.76	5.87±1.18	

1. Sticky trap (TRAP A ROACH HOY HOY) baited with rat pellet was used in this study.
2. Adult cockroaches and nymphs were counted.
3. No significant difference ($P > 0.05$) was observed in terms of the number of cockroaches trapped per household, based on One way Analysis of Variance.

Table 2: Cockroach infestation prevalence in four locations in Penang, Malaysia.

Location	No. of household examined	No. of positive household (%)
Chulia Street & Dato Keramat Road	28	26 (92.9%)
Kampung Paya, Teluk Kumbar	20	14 (70.0%)
Ujung Batu, Butterworth	24	22 (91.7%)
Taman Permai & Taman Pekaka, Jalan Sg. Dua	20	15 (75.0%)
Total	92	77 (83.7%)

The Australian cockroach (*P. australasiae*) was only found in Kampung Paya, which is a rural area. This species has been reported to be an outdoor species that prefers vegetation (Cochran *et al* 1975). It is only occasionally that it enters human dwellings at night for food. In view of its natural preference, its presence is always limited to rural areas which are rich in vegetation (Oothuman *et al* 1984, Yap *et al* 1991).

The brown-banded cockroach, *S. longipalpa*, was only trapped in very small numbers in the kitchen although it has been observed in large numbers in the premises of the household studied. This cockroach is generally found in the drier areas of the house, particularly in bedrooms, drawers, furnitures, television, etc. (Cornwell 1968). Consequently, compared to other species, the probability of encountering this species in the kitchen is very low. The trap shyness of this cockroach with regards to the sticky trap (Moore & Granovsky 1983) is another factor that contributes to the low capture of this species in the present study.

The German cockroach (*Blattella germanica*) was not found in our studies, although its presence has been previously reported in Malaysia (Yap 1979). However it has been observed that this species is found abundantly in hotels and restaurants (Yap *et al* 1991). As these places were not accessible to us during our studies, none were trapped in our studies. In Shanghai, China, Zhai (1990) has reported that this cockroach was found abundantly in hotels and restaurants only.

In this study, the households in Chulia Street and Dato Keramat Road, which constitute an urban area, had the highest rate of infestation (92.9%). The crowded and contiguous units of shop houses in this area enable the cockroaches to spread easily. The preponderance of food hawkers in this area, with their indiscriminate disposal of food leftovers, also contributes to the rapid breeding of this insect. Since these two factors are not prevalent in rural areas, the infestation rate of household in such places would be lower, eg. 70.0% in Kampung Paya.

The lack of significant difference in the number of cockroach per infested household in the four localities indicates that the level of household sanitary cleanliness in rural and urban area is quite uniform and also that household insecticides for the control of insect pests in the four areas are widely used.

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