Research Note

The diurnal activities of *Musca domestica* Linnaeus and *Chrysomya megacephala* Fabricius in Bangkok

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Abstract: The activities of adult *Musca domestica* and *Chrysomya megacephala* were studied in Bangkok by using fly traps set at 2-hr intervals for 24 hr. *Musca domestica* was diurnally periodic with a peak at 12:00–14:00 o'clock and *Chrysomya megacephala* was diurnally periodic with a peak at 16:00–18:00 o'clock.

Although several text books on flies have been published (Senior White *et al.*, 1940; Oldroyd, 1964; Van Emden, 1965; Kano *et al.*, 1967; Kano and Shinonaga, 1968; Shinonaga and Kano, 1971; James and Harwood, 1970; Soulsby, 1973) not much consideration has been given to the activities of flies of the 24 hr. Fly surveys in Bangkok and neighbouring provinces have already been done by Sucharit *et al.* (1976) and Tumrasvin *et al.* (1977, 1979).

The periodicity of flies is reflected in variations in the number of flies collected at different hours. These variations are related to the fly density which is used for various studies of fly prevalence, fly control and others. *Musca domestica* and *Chrysomya megacephala* are the most important species of flies in Thailand from the medical standpoint. The authors, therefore, investigated the diurnal activities of these flies in a 24-hr period in Bangkok.

The activities of flies during 24-hr period were studied by counting the number of flies collected with fly traps which were used in the previous study by Sucharit *et al.* (1976).

The traps were set at 2-hr intervals from 6 o'clock for 24 hr at the garbage piles outside the cafeteria of the Faculty of Tropical Medicine, Bangkok. The flies collected were counted and identified separately for each time interval. The traps were set for 10 days during July 1979.

From the 1,358 flies collected in 10 days, 3 genera and 6 species were found. *M. domestica* was the most common species. *C. megacephala* was the secondary common (Table 1). The activities of *M. domestica* started from 6:00–8:00 o'clock, rose sharply during midday and then sharply decreased.

Few flies were trapped at 18:00–20:00 o'clock and no fly was found during the night. The peak density was at 12:00–14:00 o'clock with a minor peak around 8:00–10:00 o'clock. *M. domestica* revealed a markedly diurnal activity. The activity of *C. megacephala* was diurnal with a peak at 16:00–18:00 o'clock (Fig. 1).

The activity of *M. domestica* was diurnally periodic with a peak at 12:00–14:00 o'clock and a minor peak around 8:00–10:00 o'clock. The number increased or decreased in correlation with time lapses before and after midday correlated with the amount of light. The greater the amount of light the greater the number of flies. Phototaxis seems to be playing an important role. From our observation in the laboratory, adult *M. domestica* gradually aggregated at the lighted area when the cage was halfway covered with dark cloths in contrast to maggots, which migrated to the darker places. Van Emden (1965) stated that *M. domestica* do not fly toward the light when disturbed. This statement does not agree with our observations. It may be that the flies do not respond to light immediately but if observed long enough the flies will certainly aggregate in a lighted area.

The activity of *C. megacephala* was diurnally periodic with peak at 16:00–18:00 o'clock. The light density seems to have no direct effect on the activity of this fly. *C. megacephala* breeds mainly in decomposing animal matters. Garbage is dumped in the morning and is markedly decomposed in the late afternoon. The decomposing matter attracts *C. megacephala* enormously dur-

Table 1 Number of flies of each species collected at various time-intervals

Species	Time (hr)												Total
	6-	8-	10-	12-	14-	16-	18-	20-	22-	24-	2-	4-	
<i>Musca domestica</i>	80	159	106	436	333	166	5	0	0	0	0	0	1,285
<i>Chrysomya megacephala</i>	5	4	8	6	11	16	0	0	0	0	0	0	50
<i>Chrysomya albiceps</i>	0	0	2	1	2	0	0	0	0	0	0	0	5
<i>Musca sorbens</i>	0	1	2	8	0	0	0	0	0	0	0	0	11
<i>Parasarcophaga knabi</i>	0	0	0	0	0	1	0	0	0	0	0	0	1
<i>Parasarcophaga ruficornis</i>	2	0	2	0	2	0	0	0	0	0	0	0	6
Total	87	164	120	451	348	183	5	0	0	0	0	0	1,358

Fig. 1 Periodicities of *Musca domestica* and *Chrysomya megacephala*

ing the late afternoon. At sunset when the light which stimulates fly activity fades out, no flies are captured.

During the nighttime in tropical countries flies rest on vegetable, electric wires, etc. This finding is similar to those of Reid made in Malaysia in 1953 (Reid, 1953). In temperate countries flies came indoors at night to shelter from the cold (Oldroyd, 1964). Night resting habits vary among the fly species. In Japan, *M. domestica* rest indoors on the ceiling during the night time, whereas the blow flies rest on plants. These indicate differences in habits of flies from different localities.

The fly density is an essential factor in studying the seasonal prevalence of flies, fly control, etc. The periodicity of flies is directly related the fly population collected at different times of the day and in different localities. Further fly studies and evaluations

must be based on a fixed time schedule appropriate to the species of flies and locations.

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REFERENCES

- James, M. T. and R. F. Harwood (1970): Herms's Medical Entomology, 6th edition, 484 pp., The Macmillan Company Collier-Macmillan Ltd., London.
- Kano, R., G. Field and S. Shinonaga (1967): Fauna Japonica Sarcophagidae, 168 pp., Biogeogr. Soc. Japan, Tokyo.
- Kano, R. and S. Shinonaga (1968): Fauna Japonica Calliphoridae, 181 pp., Biogeographical Society of Japan, Tokyo.
- Oldroyd, H. (1964): The Natural History of Flies, 201 pp., Weidenfeld and Nicolson, London.
- Reid, J. A. (1953): Notes on house-flies and blow-flies in Malaya. *Bull. Inst. Med. Res. Malaya*, 7: 26.
- Senior White, R., D. Aubertin and J. Smart (1940): The Fauna of British India, Diptera. Vol. 6, 138 pp., Taylor and Francis Ltd., London.
- Shinonaga, S. and R. Kano (1971): Fauna Japonica, Muscidae 1, 233 pp., Keigaku Publishing Co., Ltd., Tokyo.
- Soulsby, E. J. L. (1973): Helminths, Arthropods and Protozoa of Domesticated Animals, 824 pp.,

- Williams & Wilkins Company, Baltimore.
- Sucharit, S., W. Tumrasvin and S. Vutikes (1976): A survey of house flies in Bangkok and neighbouring provinces. *Southeast Asian J. Trop. Med. Public Health*, 7: 85.
- Tumrasvin, W. and S. Shinonaga (1977): Studies on medically important flies in Thailand III. *Bull. Tokyo Med. Dent. Univ.*, 24(3): 209-218.
- Tumrasvin, W., H. Kurahashi and R. Kano (1979): Studies on medically important flies in Thailand VII. *Bull. Tokyo Med. Dent. Univ.*, 26(4): 243-272.
- Van Emden, F. I. (1965): The Fauna of India and the Adjacent Countries. *In* Diptera Vol. 7,

Muscidae Part 1, Zoological Survey of India, Government of India, Calcutta.

摘 要

バンコクにおけるイエバエとオビキンバエの日周活動について

バンコクにおけるイエバエとオビキンバエの日周活動を、2時間おきに24時間、ハエトラップを設置して調査した。その結果、イエバエは明らかな昼間活動性を示し、12時から14時の時間帯に山がみられ、オビキンバエでは昼間活動性ではあるが、イエバエよりかなり遅れ、16時から18時の時間帯に山がみられた。