

STUDIES ON MEDICALLY IMPORTANT FLIES IN THAILAND. IV.

Altitudinal Distribution of Flies Belonging to Muscidae and Calliphoridae in Doi Indhanondh Mountain, Chiangmai, in Early Summer Season

BY

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ABSTRACT

The study on the altitudinal distribution of muscid and calliphorid flies was firstly carried out in the Doi Indhanondh mountain in March 1976. Twenty-eight species of muscid and calliphorid flies, belonging to 10 genera, were collected in this study. The calliphorid flies were classified into 7 genera and 19 species (2,442 individuals) and the muscid flies were classified into 3 genera and 9 species (1,061 individuals). The data and figures are shown in this paper.

INTRODUCTION

This is the first report on the altitudinal distribution of the flies in Thailand. The authors carried out the survey in the Doi Indhanondh mountain because it is the highest mountain (2,667 m above sea level) in Thailand, and the Palearctic species are found in the places above 2,000 m of the mountain.

In this paper, the authors give a general outline of the altitudinal distribution of medically important species of flies, in the families Muscidae and Calliphoridae, in this mountain in the early summer season.

METHODS

The survey was made in the Doi Indhanondh mountain from the 6th to the 10th of March, 1976. Fly traps were used to collect the flies. Eight sampling stations

were selected at every 300 m above sea level as follows: 500, 800, 1100, 1400, 1700, 2000, 2300 and 2667 m (highest). The altitude was measured by the altimeter, then 4 fly traps were set at every station for six hours and decomposed meat was used as the bait to attract the flies. Moreover, the flies were also collected by the same method in the town of Umper Jomtong (500 m), near by the Doi Indhanondh mountain. The flies collected were killed by chloroform and brought back to the laboratory where the flies were identified and counted.

RESULTS AND DISCUSSION

From Table 1, it shows clearly that the species and the numbers of flies collected are obviously different at each altitude. Most of the flies collected were calliphorids, the larvae of which feed on the decaying animal matters, including the excrements.

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Table 1. Muscid and calliphorid flies collected in Doi Indhanondh mountain with four traps using decomposed meat bait during the period from 6th to 10th, March, 1976.

	500m		800m		1100m		1400m		1700m		2000m		2300m		2667m		Total		
	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	M(F)	
MUSCIDAE																			
<i>Musca domestica</i>	29 (316)	14 (272)	9 (108)	4 (53)	7 (46)	2 (11)	1 (7)											66 (813)	
<i>M. pattoni</i>	(1)	(4)	(2)	(1)	(1)													1 (9)	
<i>M. sorbens</i>	1 (27)	1 (1)	1 (1)	2 (1)	(1)													4 (31)	
<i>M. ventrosa</i>	3 (7)	1 (6)			(3)													4 (16)	
<i>M. conducens</i>	1 (5)	(2)		(1)														1 (8)	
<i>M. formosana</i>			(11)	1 (8)	(14)													1 (33)	
<i>Morellia biseta</i>		(2)	(9)	1 (4)	(1)													1 (16)	
<i>M. sp.</i>		(1)	(3)	1 (12)	(2)													1 (18)	
<i>Eypellia malaisei</i>																(36)		(36)	
Total	34 (356)	17 (288)	9 (134)	9 (80)	7 (68)	2 (11)	1 (7)									(36)		79 (980)	
CALLIPHORIDAE																			
<i>Calliphora vomitoria</i>																			
<i>C. pattoni</i>		3 (9)	9 (7)	1 (1)														3 (78)	
<i>Catapicephala sinica</i>		1 (4)	2 (7)	2 (0)														5 (11)	
<i>C. nichikoeae</i>		(1)	3 (0)	1 (1)														4 (2)	
<i>C. kurashii</i>		3 (17)	14 (76)	5 (21)														24 (136)	
<i>Chrysomya pinguis</i>																			
<i>C. thanomithini</i>																		2 (62)	
<i>C. megacephala</i>	14 (196)	9 (218)	11 (176)	6 (38)	2 (21)	2 (18)	(31)											43 (733)	
<i>C. defixa</i>		3 (4)	17 (46)	18 (31)	(2)	1 (5)												39 (88)	
<i>C. nigripes</i>		4 (21)	17 (72)	6 (44)	2 (21)	1 (1)												29 (159)	
<i>C. villeneuvei</i>		9 (13)	1 (48)	3 (29)	2 (12)	2 (2)												15 (104)	
<i>C. albiceps</i>	5 (17)	12 (54)	8 (37)	1 (28)	(10)													26 (146)	
<i>Hypopygiopsis infumata</i>		1 (6)	2 (5)	1 (0)	(1)													4 (14)	
<i>H. tumasvini</i>		(2)	(1)	(1)														1 (4)	
<i>Hemipyrellia ligurians</i>	1 (7)	2 (16)	7 (15)	1 (6)														11 (45)	
<i>Lucilia papuensis</i>		(2)	17 (42)	2 (63)	5 (19)	1 (4)												25 (130)	
<i>L. cuprina</i>		(1)	1 (3)	(1)	(1)													1 (27)	
<i>L. porphyrina</i>			2 (27)	1 (54)	5 (97)	2 (114)	4 (71)											15 (409)	
<i>Idiella sp.</i>		(5)	1 (11)	(4)														1 (20)	
Total	20 (242)	47 (364)	112 (573)	48 (381)	18 (203)	8 (173)	4 (103)											261 (2181)	

M=Male, F=Female

The number of muscids collected was small when compared with the calliphorids. This might be because the bait used was decayed meat but most of these flies were herbivorous, usually found on the decomposed vegetable, including the herbivorous animal faeces.³⁾

Twenty-eight species of the muscid and calliphorid flies, belonging to 10 genera, were collected in this study. The calliphorid flies were classified into 7 genera and 19 species (2,442 individuals) while the muscids were classified into 3 genera and 9 species (1,061 individuals). *Musca domestica* (879 individuals) belonging to Muscidae and *Chrysomya megacephala* (776 individuals) belonging to Calliphoridae were most numerous in each family.

Fig. 1 shows the total number of muscid and calliphorid flies at altitudinally different places. About 70 (69.71) percent of the flies collected were calliphorids and about 30 (30.29) percent were muscids. Among the 9 stations, the largest population of the muscid and calliphorid flies was recorded at the town station and the 800 m station, respectively. Most of them were *M. domestica* and *C. megacephala*. It was very

strange that between the 2,000 m and 2,300 m stations, the muscid flies did not appear at all and the smallest population of the muscid flies was at the level of 2,000 m. For the calliphorid flies the smallest population was recorded at the 2,300 m station. This might be possibly due to that there were no mountainous human dwellings at these levels of the mountain or other factors might be involved.

Fig. 2 shows the altitudinal distribution of the 9 muscid species. Among these flies, *M. domestica* occupied 82.85 percent of the total number of muscid flies collected. They appeared from the town to the 2,000 m station, but were chiefly collected at the town station. It was very obvious that every species of the *Musca* collected was also the town species, but *Morellia* spp. and *Rypellia malaisei* were shown to be the true mountainous or forest species, especially *R. malaisei* which appeared at the high level of the mountain with cool weather.

Fig. 3 shows the altitudinal distribution of 19 species of calliphorid flies. Among these flies the population of *C. megacephala* was the largest. It occupied 31.78 percent of the total calliphorid flies. Only *C. megacephala*, *C. albiceps*, *Hemipyrellia liguriens* and *Lucilia cuprina* were distributed in the town station. *Calliphora vomitoria* and *C. pattoni* were collected at the 2,300 m and 2,667 m (highest) stations only, because these 2 species are the Palearctic species. These areas seemed to be the coolest areas of this mountain. The population of the general species of the calliphorid flies seemed to be the largest at the 800 m station. Among the *Lucilia* group, *L. porphyrina* seemed to have the largest population and was most numerous between the levels of 1,400 m and 1,700 m above sea level. Among the *Chrysomya* group, the

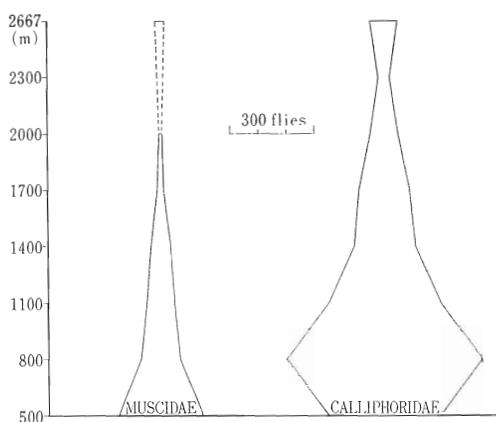


Fig. 1. Altitudinal distribution of two families of flies (dotted lines indicate area between positive and negative stations).

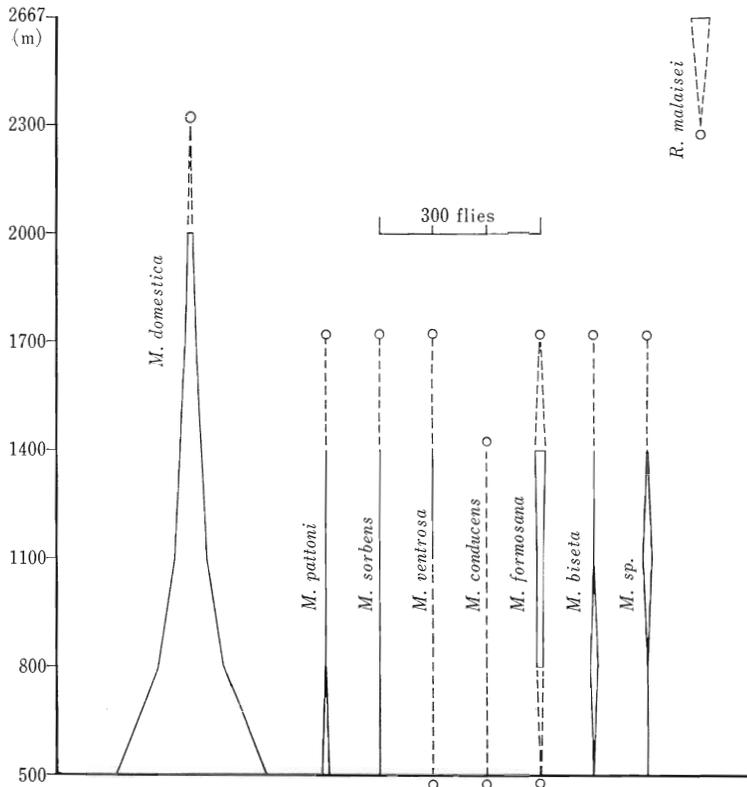


Fig. 2. Altitudinal distribution of muscid flies (dotted lines indicate area between positive and negative stations)

altitudinal distribution of most of the species extended to about 1,700 m except for *C. thanomthini*, which was recorded from the 1,700 m station to the 2,667 m station only. *C. thanomthini* seemed to like a cooler weather than any of the other flies in the same group.

CONCLUSION

From this study it might be concluded that among the total flies collected, *M. domestica* and *C. megacephala* are the most numerous. These two species are very common in the town throughout Thailand, acting as vectors of many medically important parasites in man and animals.²⁾ The flies of these species breed on the human faeces, animal dung and carcasses.^{1,4)} It is

not easy to discuss about the altitudinal distribution of the flies from the results of this study. There are many factors involving and affecting their distribution patterns. The authors have the same idea as Shinonaga³⁾ that environmental factors, especially temperature or climate, including humidity, fauna, flora and human dwellings are the factors affecting the altitudinal distribution of the fly fauna. The authors had surveyed the fly fauna in this mountain in the winter season, and *C. vomitoria* was collected in the 1,400 m area around the mountainous human dwellings but during this period of time it was collected between the 2,300 m station and the 2,667 m station instead. Therefore, it might be noted that the altitudinal distribution

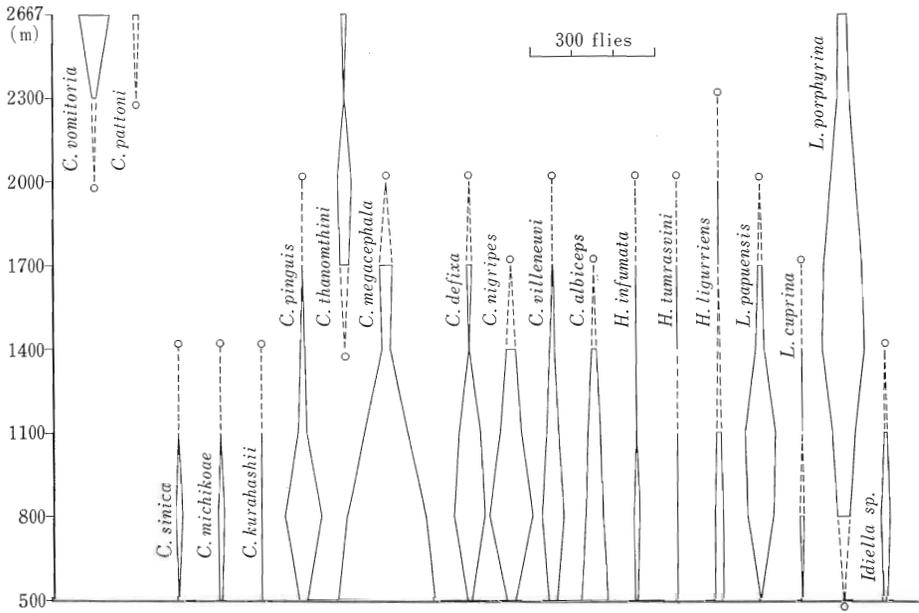


Fig. 3. Altitudinal distribution of calliphorid flies (dotted lines indicate area between positive and negative stations).

of the fly fauna varies with the seasonal changes. However, the results of this study can be used as the general criteria to determine the altitudinal distribution of the fly fauna in the Doi Indhanondh mountain in the early summer season.

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