1. Mukherjee, N. G., *Handbook of sericulture*, Bengal Secretariat Book Dept., Calcutta, 1919, p. 296.
2. Ghosh, C. C., *Silk production and weaving in India*, CSIR Monograph, Delhi, 1949, p. 61.
3. Jolly, M. S., *Uzifly: its identification, prevention and control*, Central Sericultural Research and Training Institute, Mysore, 1981, p. 1.
4. Kasturi Bai, A. R., Mahadevappa, D., Nirmala, M. R. and Jyothi, H. K., *Curr. Sci.*, 1986, 55, 1038.

IMPACT OF POLLEN FOOD ON THE FECUNDITY AND FEEDING TIME IN TWO SPECIES OF THRIPS (INSECTA: THYSANOPTERA) INFESTING FLOWERS OF SOLANACEAE

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THRIPS-flower interactions in relation to pollen feeding and pollination have been reported earlier[1–4]. Velayudhan and Annadurai[5] documented the role of thrips in pollinating several solanaceous plants. Observations presented here highlight the pollen feeding habits of *Ceratothripoides cameroni* Bagnall and *Frankliniella schultzei* Trybom, infesting the flowers of such solanaceous plants as *Solanum melongena* Linn., *Solanum trilobatum* Linn., *Solanum xanthocarpum* Schrad. and Wendel, *Solanum nigrum* Linn., *Capsicum fruitescens* Linn. and *Physalis* sp.

Adults and larvae of *C. cameroni* and *F. schultzei* collected from their respective host flowers were reared in the laboratory in plastic vials wrapped with parafilm. The method adopted by Kirk[4] was modified by using empty polythene capsule tubes to study the pollen feeding behaviour. Fecundity was calculated when reared on pollen as food as well as when reared within flowers.

Individuals of *C. cameroni* readily fed on the pollen grains of *S. melongena*, *S. trilobatum*, *S. xanthocarpum* and *S. nigrum*, whereas the other host pollen was rejected or the insects fed reluctantly. But a preference was often noticed for the pollen grains of *S. melongena* as compared to other pollen grains. Unlike *C. cameroni*, *F. schultzei* fed on all the species of pollen grains offered and the preference was also for *S. melongena*. Table 1 summarizes the data on the time taken to feed on a single pollen by the first instar larvae, second instar larvae and

Table 1 *Impact of pollen food on feeding time (sec) and fecundity of two species of Anthophilous thrips*

	Thrips species						Fecundity			
	C. cameroni			*F. schultzei*			*C. cameroni*		*F. schultzei*	
Pollen species	I	II	Adult	I	II	Adult	Pollen alone	Entire flower	Pollen alone	Entire flower
S. melongena	9.3 ± 1.5	8.7 ± 0.6	7.3 ± 0.6	11.3 ± 1.5	6.7 ± 0.6	4.7 ± 0.6	55.3 ± 1.2	75.7 ± 2.5	42.7 ± 3.1	63.0 ± 2.0
S. trilobatum	9.3 ± 0.6	10.7 ± 1.2	6.7 ± 1.2	11.0 ± 1.0	7.7 ± 1.5	6.0 ± 1.0	48.7 ± 3.1	65.7 ± 2.1	34.3 ± 1.5	53.3 ± 3.5
S. xanthocarpum	11.6 ± 0.6	12.0 ± 2.0	7.3 ± 0.6	13.7 ± 2.1	6.3 ± 1.5	8.0 ± 1.0	33.7 ± 1.5	53.7 ± 2.1	32.3 ± 2.5	47.3 ± 3.1
S. nigrum	12.7 ± 2.1	10.7 ± 2.1	8.7 ± 1.5	13.7 ± 1.1	7.0 ± 1.7	8.0 ± 1.0	16.0 ± 2.0	22.3 ± 2.1	33.0 ± 2.6	44.7 ± 3.2
C. fruitescens	13.7 ± 1.5	10.7 ± 1.5	11.3 ± 1.5	11.7 ± 1.5	5.3 ± 0.6	9.7 ± 0.6	– –	– –	33.7 ± 3.2	35.3 ± 3.1
Physalis sp.	14.3 ± 0.6	13.7 ± 1.5	10.0 ± 2.6	11.3 ± 0.6	6.3 ± 0.6	11.3 ± 1.9	– -	– –	34.4 ± 3.1	36.0 ± 3.3

Critical difference: thrips = 5.7; host plant = 2.9; stage = 6.6; thrips × stage = 4.4; thrips × host plant = 1.4; host plant × stage = 1.5; thrips × stage × host plant = 1.2; Values mean of 5 replicates; ± standard deviation.

adults of *C. cameroni* and *F. schultzei*. Significant differences were noticed not only among the different species of thrips but also among the different species of pollen grains offered. The time taken by *C. cameroni* adults to feed on the pollen grains of *C. fruitescens* (19.3±1.5 sec) and *Physalis* sp. (10±2.6 sec) was much longer than that on all other host plants. *F. schultzei* utilized all the pollen grains much faster than *C. cameroni*. The first larvae of both the species took a longer time to feed on a single pollen grain than the adults.

C. cameroni completes its life cycle only on *S. melongena*, *S. trilobatum*, *S. xanthocarpum* and *S. nigrum*. A higher fecundity resulted (22.3±2.1 to 75±2.5) when entire flowers were provided, whereas individuals fed only with pollen grains, laid a lesser number of eggs (16±2 to 55.3±1.2). *F. schultzei* also showed a similar trend with a higher fecundity (63±2) when fed on flowers of *S.melongena* as compared to *Physalis* sp. (36±3.2). *C. cameroni* fed on pollen grains with volume ranging from 771.6 μm^3 (*S. nigrum*) to 6224.4 μm^3 (*S. melongena*) and the feeding time also varies with the different species of pollen grains depending upon their volume. Adults of *F. schultzei* starved for 3 hr visit a maximum of 36±3 pollen grains of *S. melongena* within 5 min and *C. cameroni* visit only 22±4 pollen grains/5 min.

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The relationship between the thrips and the pollen is of paramount importance for a proper assessment of the value of thrips in pollination. Many species of flower thrips have pollen as their major food source[2,4] and are able to recognize their host by its pollen. The varying time spent by different species of thrips reflects the degree of host specificity. The ability of *F. schultzei* to utilize all the species of solanaceous pollen grains offered directly indicate their colonizing tendency on a wide range of solanaceous flowers. But *C. cameroni* has a restricted host range as evidenced by their feeding preference only to a few species of Solanaceae. Absence of enough pollen will tend to have an impact on the reproductive rate and the population size of the thrips[4]. In the present study, the increased rate of pollen intake as well as increased fecundity noticed in individuals feeding on the pollen grains of *S. melongena* clearly indicate it to be a more preferred host. The reduction in fecundity noticed among the individuals when fed only with pollen grains as compared to individuals fed with entire flowers is indicative of the nectar and the microenvironment present inside the flowers to enhance fecundity.

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1. Osborn, H., *Insect Life*, 1888, **1**, 137.
2. Grinfel'd, E. K., *Ent. Obozr.*, 1959, **38**, 798.
3. Ananthakrishnan, T. N., *Curr. Sci.*, 1982, **51**, 168.
4. Kirk, W. D. S., *Aust. J. Ecol.*, 1984, **9**, 9.
5. Velayudhan, R. and Annadurai, R. S., *Proc. Indian Acad. Sci (Anim. Sci)*, 1986, **95**, 109.