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RESEARCH ARTICLE

Biodiversity of tachinid flies (Diptera : Tachinidae) from Western Maharashtra

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ABSTRACT

Tachinid flies (Diptera : Tachidae) are potential biocontrol agents of insect pests. Therefore, biodiversity of Tachinid flies have been studied from Western Ghats and plain region of Western Maharashtra. In all, 20 species of Tachinids have been recorded attacking various lepidopterious pests *viz., Helicoverpa armigera* (Hubn.), *Spodoptera litura* Fab., *Spodoptera exigua* Fab., *Achea janata* (Linn.), *Tarache tobabilis* Walk., *Anomis* sp., *Chilo* spp., *Sesamia inferens,* silkworms, etc. with a very high per cent parasitism.

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INTRODUCTION

Tachinid flies (Diptera : Tachinidae) are potential biocontrol agents of lepidopterous pests. However some species attack useful insects like mulberry and wild silkworms. Therefore, biodiversity of tachinids have been studied from Western Maharashtra. Western Maharashtra is admixture of forest (Western Ghats) and agricultural crops (plane region). Insects cause severe damage to both forest and plane region crops and difficult to control with insecticides. Secondly insecticides lead serious problems such as pollution, health hazards, killing of beneficial organisms, pest resistance, pest resurgence, secondary pest out break etc. Hence, survey, conservation, protection and utilization of natural enemies against pest insects is the need of the day. Keeping in view all above facts the present work was carried out. Review of literature indicates that Thomson (1944), Patel (1980), Natrajan and Sundaramurthy (1990), Carl (1976), etc. worked on the diversity of tachinid parasitoids of insect pests.

MATERIALS AND METHODS

During the survey of Ichneumonid parasitoids, during 2008 to 2012 under UGC Project No. 37/334/2009 (12), a huge number of lepidopterous caterpillars were collected. Along with the Ichneumonids, some tachinids have also been found emerged from pest caterpillars. Later, the tachinids have been identified by consulting appropriate literature (Thompson, 1944; Crosskey, 1976). The survey of parasitoids was conducted at different study spots in district Kolhapur, Satara and Pune at 15 days interval by adopting 1 man 1 hr collection of caterpillars from both forest and agro-ecosystems including Western Ghats. The collected caterpillars were reared on the respective food plants in the laboratory (25±1°C, 70-75% RH and 12 hr photoperiod) for screening tachinid parasitoids.

RESULTS AND DISCUSSION

Results recorded in Table 1 indicate that in Western Maharashtra, tachinids attacked both pests and useful insects such as silkworms. Thus, tachinids acts as both biocontrol agent for agricultural and forest insect pests and pests for various silk worm species. The highest per cent parasitism (64%) was noted on mulberry silk worm *Bombyx mori* L. by uzifly *Exorista bombycis* (Louis) and lowest (1.5%) by *Podomyia setosa* Dol on *Parnara mathias* Fab. from forest ecosystem.

E. bombycis, E. sorbillans, B. zebina and *C. pavida* were dominant on silkworm species. However, on pest insects,

Table 1 : Biodiversity of Tachinids from Western Maharashtra

Sr. No.	Parasitoid name	Host name	Per cent parasi-tism	Occurrence forest/ agro-ecosystem
1.	*Actia monticola* Tams	*Tarache notabilis* Walk.	13	Agro-
		Eutectona machearalis (Walk.)	8	Forest
		Hublaea puera Cramer	4	Forest
2.	*Afrovoria indica* Mesnil	*Helicoverpa armigera* (Hubner)	5	Agro-
3.	*Blepharella lateralis* Macq.	*Spodoptera litura* (Fab.)	13	Agro-
4.	*Blepharella setigera* Certi.	*S. litura*	7	Agro-
		S. litura	5	Forest
5.	*Blepharipha zebina* Walker	*Bombyx mori* L.	23	Forest
		Antheraea mylitta D.	20	Agro-
		A. militta	2.5	Forest
		Cricula trifenestrata Helfer	13	Agro-
6.	*Carcelia buitenz orgensis* Baranoff	*Achea janata (*Linn.)	13	Agro-
7.	*C. kockiana* Townsend	*A. janata*	3	Agro-
		Lymantria sp.	2	Forest
8.	*Drino imberbis* Weid	*H. armigera*	9.5	Agro-
9.	*Exorista fallax* Mg	*H. armigera*	22	Agro-
10.	*Exorista mobycis* (Louis)	*B. mori*	64	Agro-
		A. mylitta	32	Forest
		H. armigera	18	Agro-
		Adisura atkinsoni	5	Agro-
11.	*Exorista sorbillan* (Weid)	*B. mori*	62	Agro-
		A. mylitta	36	Forest
		Actias selene	23	Agro-
		H. armigera	5	Agro-
12.	*Exorista siviloides* Bar.	*T. notabilis*	17	Agro-
		E. machearalis	2.5	Forest
13.	*Goniophthalmus halli* Mesnil	*H. armigera*	12	Agro-
			3.5	Forest
14,	*Ctenophorocera pavida* (Meigen)	*B. mori*	42	Agro-
		S. litura	3	Agro-
15.	*Halidya luteicornis* Walker	*A. janata*	2	Agro-
16.	*Isomeria cinerasnous* Rondani	*H. armigera*	7	Agro-
17.	*Podomyia setosa* Dol	*Parnara mathias* (Fab.)	4	Agro-
		A. janata	1.5	Agro-
		Melantis ishmene	2.5	Forest
18.	*Sturmiopsis inferens* Townsend	*Chilo partellus* (Swin.) *Chilo* sp.	2.5	Agro-
		Chilo infuscatellus (Snellen)	2.0	Agro-
		Sesamia inferens (Walker)	6	Agro-
19.	*S. samiberbis* Bezzi	*C. infuscatellus*	3	Agro-
20.	*Drino* sp.	*Spodoptera exigna*	3	Agro-

although attacked by several tachinid flies, the percentage of parasitism was comparatively low than on silkworm species, showing more affinity towards silkworms.

Narayanaswamy *et al*. (1993) studied ovipositional preferences of *E. bombycis* towards some lepidopteran insects. They noted that the uzifly mostly preferred *B. mori* larve (54.52%) followed by *Samia cynthia ricini* (13.22%). *A. mylitta* (10.00%), *S. litura* (8.91%), *H. armigera* (7.41%), *A. janata* (5.16%) and *A. atkinsoni* (0.86%). They also tried *Corcera cephalonica* larvae but, no development was noted on these larvae. Similarly, *E. sorbillans* parasitized almost all silkworm species found in India. *B. zebina* was the most injurious parasitoid of non-mulberry silk worms. It caused 80.00 per cent damage to muga silkworms *A. assama* (Goswami and Barah, 1989) and also to *C. tritenestrata* on large extent. Control of uziflies is great challenge to sericulturist. However, tachinids play a very important role in control of insect pests from agroecosystems. According to Nagarkatti (1981) dipterous parasitoids have good potential in control of *H. armigera* in India. Rearing methods for a tachinid fly *Carcelia illota* (Curran) have been developed by Patel *et al*. (1970). Similarly, mass rearing technique has been developed for *Goniophthalmus* halli Mesn (Patel and Singh, 1972). The tachinid *Peribaea orbata* (Wied.) can also be mass reared easily in the laboratory. This parasitoid is effective against *S. litura* and *H. armigera*. However, it seems that mass rearing of solitary parasitoids is laborious and uneconomical since the parasitized larvae have cannibalism. As pesticides never solve the permanent problem of pest control, and lead several serious problems, the biocontrol agents like tachinids should be surveyed, conserved and utilized for pest control.

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