



BIODIVERSITY OF ICHNEUMONID FLIES (HYMENOPTERA : ICHNEUMONIDAE) FROM WESTERN GHATS, MAHARASHTRA

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ABSTRACT

Ichneumonids (Hymenoptera : Ichneumonidae) are very good biocontrol agents of forest insect pests. Therefore, as part of conservation and protection of flora of Western Ghats, biodiversity of Ichneumonid flies has been studied from Western Ghats, Maharashtra. In all, 35 species belonging to genera *Diadegma*, *Isotima*, *Goryphus*, *Charops*, *Campoletis*, *Enicospilus*, *Pimpla*, *Xanthopimpla*, *Eriborus*, *Netelia* and *Ecthromorpha* have been reported parasitizing lepidopterous pests of forest trees.

KEY WORDS: Ichneumonids, Biocontrol agents, forest pests, Western Ghats.

INTRODUCTION

Western Ghats is among 18 hot spots of the world visualized for protection and conservation of biodiversity. The western ghats are the range of high hills that runs along the west coast of peninsular India from the river Tapi in the north to Kanyakumari in South. It covers an area of 159,000 sq.km. Western Ghats due to a humid tropical climate, unusual geological stability and evolutionary continuity is one of the biodiversity reach area. India's forest cover losing at the rate of 144,000 hectares per year (Sathe & Pandharbale, 2008). Western Ghats is also one of the target, facing the problem of deforestation and loss of biodiversity. Pests, diseases and fire are major enemies of forestry and insect pests rank first in damage intensity (Sathe Pandharbale, 2008). Therefore, control of insect pests is must for saving floral diversity. For hoping ecofriendly control of pests biological control is the best solution (Coppel & Martins, 1971).

Ichneumonids (Hymenoptera : Ichneumonidae) are very good biocontrol agents of forest pests. 60,000 species of Ichneumonids have been described from all over the world (Gupta, 1987). Therefore, biodiversity of Ichneumonids has been studied from Western Ghats of Maharashtra. Review of literature indicates that Bhoje & Sathe (2008), Baltazar (1966), Gupta (1967), Gupta & Tikar (1967), Morley (1913), Sathe *et al.* (2003), Townes (1969), Townes *et al.* (1961) etc. have attempted biodiversity of Ichneumonids from India.

MATERIALS AND METHODS

Collection of Ichneumonids by insect net from study spots Sawantwadi, Azra, Sindhudurg, Kankavali, Gaganbavada, Fonda, Satara, Koyana, Mahabaleshwar and Katraj have been made 15 days interval during the

years 2008 to 2011 by 1 man 1 hr search method. The collection was also supplemented by lepidopterous pest larvae for screening parasitoids in the laboratory (25 ± 1°C, 75-80% R.H., 12 hr photoperiod). Later, the parasitoids have been identified by consulting literature cited in the text and per cent parasitism in pest larvae were calculated on the basis larvae parasitized. During the experiments parasitoids were fed with 50% honey and pest larvae on their respective food plants. After experiments parasitoids have been released in the field from they were collected.

RESULTS & DISCUSSION

Results are recorded in table -1 The results recorded in table - 1 indicates that in forest ecosystem the genera *Campoletis*, *Diadegma*, *Charops*, *Xanthopimpla*, *Enicospilus* and *Netelia* were dominant over others. *Xanthopimpla* and *Ecthromorpha* parasitized pest borer larvae while, other genera were involved in parasitizing defoliators, leaf miner and leaf rollers. *Pimpla*, *Xanthopimpla* and *Ecthromorpha* parasitized pupae of the pests and the rest genera larvae of pests.

Highest per cent parasitism was caused by *C. Chloridae* on *H. armigera* larvae. However, *H. armigera* is more destructive to agricultural crops such as gram, red gram, maize, cotton, tomato, sorghum etc. than forest plants. The pest might be in suppressed condition in forest ecosystem due to persistent forest ecosystem which provide constant number of hosts for breeding *C. chloridae*. Majority of Ichneumonid parasitoids were monophagous. However, *Campoletis chloridae* and *Charops* were polyphagous. At very high and low altitude parasitoid abundance was low and at medium altitude 600-1200m MSL it was high probably due to sufficient vegetation available throughout the year. A very potential biocontrol agents (parasitoids) recorded on

Table - 1 Biodiversity of Ichneumonids from Western Ghats, Maharashtra

S.N.	Parasitoid	Pest	Host plant	Percent Parasitism
1.	<i>Xanthopimpla nursei</i> Cameron	<i>Sylepta derogata</i> Fab.	Fig, cotton, mango, litchi, Bamboo	8.00
		<i>Sylepta balteata</i> Fab.	" "	5.00
		<i>Sylepta lunalis</i> Guen.	" "	8.00
		<i>Chilo partellus</i> (Swin.)	Paddy	21.00
2.	<i>X. punctata</i> Fab.	<i>C. partellus</i>	—	7.00
3.	<i>X. cera</i> Cameron	<i>Scirpophaga nivella</i> Fab.	—	13.00
4.	<i>X. stemator</i> Cameron	<i>C. partellus</i>	—	11.00
		<i>Sesamia inferens</i>	—	4.00
5.	<i>X. regina</i> Morley	<i>Parnara mathias</i> Fab.	—	2.00
6.	<i>X. pedator</i> Fab.	<i>Chilo</i> spp.	Paddy	17.00
7.	<i>Ecthomorpha notulatoria</i> Fab.	<i>Polychrosis cellifera</i> Meyrick	Jamun (<i>Syzygium</i> sp.)	12.00
		<i>Womona coffearia</i> N.	" "	6.00
		Jamun stem borer	" "	16.00
		Unknown caterpillar	Babul	1.50
8.	<i>E. intricatoria</i> Fab.	Jamun stem borer	Babul	3.00
9.	<i>Lissopimpla albopicta</i> Walk.	Babul stem borer	Babul	1.50
		<i>S. lunalis</i>	Mango	5.00
		<i>Pyrausta</i> sp.	Fig	3.00
10.	<i>Campoletis chlorideae</i> Uchida	<i>Helicoverpa armigera</i> (Hubn.)	Clover	42.00
			Shisham	46.00
11.	<i>Enicospilus</i> spp.	<i>Geometrina</i> sp.	Deodar	2.00
		<i>Phycita abietella</i>	Deodar	3.00
		<i>Ectropis deodarae</i>	Deodar	11.00
12.	<i>Enicospilus</i> spp. <i>Netelia</i> sp. <i>Enicospilus</i> sp. <i>Enicospilus</i> sp.	<i>Plecoptera reflex</i> G-Guen	Shisham	14.00
		<i>P. reflexa</i>	Shisham	5.00
		<i>Lymantria</i> sp.	Sal	3.00
		<i>Euproctis scintillans</i>	Babul	2.00
13.	<i>Charops</i> sp.	<i>E. scintillans</i>	Babul	9.50
14.	<i>Charops obtusus</i> Morley	<i>E. scintillans</i>	Babul	3.50
15.	<i>Charops</i> sp.	<i>Calliteara grotei</i> Moore	Babul	2.00
16.	<i>Charops dominans</i> Walk.	<i>Thiocidas postica</i> Walk.	Ber	7.50
17.	<i>Diadegma</i> Sp.	Neem Caterpillar	Neem	10.00
18.	<i>Diadegma fenestralis</i>	<i>H. armigera</i>	Fig.	7.00
			Shisham	13.00
19.	<i>Charops</i> sp.	<i>Papilio demoleus</i> Linn.	Citrus, ber	1.50
		<i>daspus folus</i>	Paddy-grasses	3.50
		<i>Viracola isocrates</i>	Pomegranate	2.00
20.	<i>Eriborus argenteopilosus</i>	<i>H. armigera</i>	Glover	2.00
		<i>H. armigera</i>	Shisham	3.00
		<i>H. armigera</i>	Fig	1.00

21.	<i>Isotima</i> sp.	<i>Chilo</i> spp.	Grasses	17.00
22.	<i>Isotima javensis</i>	<i>Chilo</i> spp.	Paddy	15.00
			Sugarcane	7.50
23.	<i>Pimpla</i> sp.	<i>Chilo</i> spp.	Grasses	3.50
			Paddy	5.00
24.	<i>Pimpla turionelae</i> L.	<i>Tenthredo instabilis</i>	Unknown	2.00
25.	<i>Pimpla apollyon</i> Morley	<i>Tenthredo</i> sp.	Unknown	1.00
26.	<i>Aphidius colemani</i> Viereck	<i>Hyalopterus prunii</i>	Peach	5.50
		<i>Myzus persicae</i>	Bamboo	3.00
		<i>M. persicae</i>	Papaya	9.50
27.	<i>Aphidius picipes</i> (Nees)	<i>Hydaphis coriandri</i>	Coriander	12.50
28.	<i>Campoplex hydda</i> cam.	<i>Defoliating caterpillar</i>	Grasses	2.00
29.	<i>Campoplex</i> sp.	<i>Phthoramea opeculella</i> zeller	Potato	3.00
30.	<i>Trichomalopsis apanteloctena</i> (Craw.)	<i>Scirpophaga incertulus</i>	Paddy	3.50
31.	<i>Lipolexis scutellaris</i> Mack.	<i>Aphis craccivora</i>	<i>Vicia fabo</i>	5.00
32.	<i>Henicospilus uniliniatus</i> Cam.	Unknown caterpillar	Grasses	1.00
33.	<i>H. rufus</i> Tos.	<i>Dasychira mendosa</i>	Grasses	1.50
34.	<i>H. reticulates</i> Cameron	<i>Dasychira mendosa</i>	Unknown	1.00
35.	<i>H. merdarius</i> Grav.	<i>Euproctis fraterna</i> Moore	Caster	3.00

forest pests from Western Ghats refer to *C. chlorideae* (42.46%), *X. nersei* (21%), *X. pedator* (17%) and *Isotima* sp. (17%).

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