

Diversity of Braconid Parasitoids (Hymenoptera: Braconide) of Horticultural Insect Pests from Kolhapur, Maharashtra

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Abstract: *Braconids (Hymenoptera: Braconidae) are the potential biocontrol agents of insect pests attacking economically important crop plants. Braconids are exclusively parasitic and are reported mainly on lepidopterous pests. These flies parasitize egg, larval, and pupal stage of the insect pests. Horticultural crops are attacked by lepidopterous pests causing severe damage to crops and there by minimizes crop yield. The use of braconid parasitoids as pest control agents helps to reduce the pest population. The braconids are rearable in laboratories and reared parasitoids can be used in pest control programs. The correct identification, host preference and parasitic potential of the parasitoids plays important role in their utilization in pest control programs. The species reported belongs to genus Cotesia, Apanteles, Bracon, Glyptapenteles, Chilonus, Dolichogenidea, Agathis, Meteorus etc. and have been found parasitizing the insect pests of different horticultural plants. Total 35 species of braconid parasitoids were reported from the Kolhapur district, Maharashtra. The studies will help to add knowledge on number of braconid species found in study area and also explore them to use in biocontrol programs in the region.*

Keywords: Survey, Braconids, Parasitoids, Horticultural Plants, Insect Pests, etc.

I. INTRODUCTION

Braconidae is the second largest family of order hymenoptera and one of the largest family of the animal kingdom (Sathe et.al, 2004). Braconids (Hymenoptera: Braconidae) are the potential biocontrol agents of insect pests attacking economically important crop plants. Braconids are exclusively parasitic and are reported on mainly lepidopterous pests. These flies parasitize egg, larval, and pupal stage of the insect pest. Horticultural crops are attacked by lepidopterous pests causing severe damage to crops and there by minimizes crop yield. The use of braconid parasitoids as pest control agents helps to reduce the pest population in their habitat. The chemical pesticides cause pollution, adverse changes in the soils, killing of beneficial insects, development of resistance in the pest against pesticides etc. Hence, biological pest control is the best alternative to the chemical pesticides. It is inexpensive and hazard free eco-friendly method of pest control.

The species of braconids are abundant everywhere in the terrestrial habitat hence, extremely important from the economic stand point of view. Braconids are exclusively parasitic and reported on all the major orders of the insects like Lepidoptera, Coleoptera, Diptera and rarely on Hymenoptera.

Survey studies of the braconids have been done by many workers (Ayyar, 1928; Lal, 1942; Rao, 1961; Rao et. al. 1970; Momd, 1983; Sathe and Inamdar, 1991; Ingawale and Sathe, 1994; Sathe and Ingawale, 1995; Taye et. al. 2017, Zubair Ahmad., et. al, 2019).

II. MATERIALS AND METHODS

The species diversity of the genus *Cotesia*, *Apanteles*, *Glyptapenteles*, *Hypomicrogaster*, *Meteorus Bracon*, *Chilonus*, *Diachasmimorpha* have been studied by survey method. Survey of Braconid parasitoids of Horticultural insect pests have been conducted at selected spots from Kolhapur district from the February, 2020 to February, 2022 by visiting different study spots at 15 days interval at morning and evening hrs. The larvae and cocoons were collected by one man one hour search method (Sathe, 2004).

The collected material was screened for parasitoids, and cocoon emergence. Adults, after emergence were identified by consulting appropriate literature, Wilkinson (1928), Mason (1981), etc. The seasonal abundance was recorded by spot observations.

III. RESULTS AND DISCUSSION

Table 1: Diversity of Braconid parasitoids of Horticultural Insect pest from Kolhapur, Maharashtra

Sr. No	Braconids	Insect Pest	Location	Common/ Rare
1	<i>Cotesia flavipes</i>	<i>Chilo partellus</i>	Karveer	Common
2	<i>Cotesia ruficrus</i>	<i>Helicoverpa armigera</i>	Peth Vadgaon	Common
3	<i>Cotesia orientalis</i>	<i>Exelastis atomasa</i>	Kodoli	Common
4	<i>Cotesia mangifera</i>	<i>Inderbella tetraonis</i>	Minche	Common
5	<i>Cotesia sesamae</i> Cameron	<i>Sesamia inferens</i> (Walker)	Hatkanangale	Common
6	<i>Cotesia</i> Cameron	Unknown	Kalamba	Common
7	<i>Cotesia anari</i>	<i>Helicoverpa armigera</i>	Kagal	Rare
8	<i>Cotesia arachi</i>	<i>Batocera rufomaculata</i>	Panhala	Common
9	<i>Cotesia bazari</i>	Unknown	Latawade	Rare
10	<i>Cotesia chilo</i>	<i>Indarbella tethaonis</i>	Sadale	Common
11	<i>Cotesia janati</i>	<i>Helicoverpa armigera</i>	Kale	Rare
12	<i>Cotesia parnari</i>	<i>Helicoverpa armigera</i>	Kotoli	Rare
13	<i>Cotesia sunflowari</i>	<i>Papilio demoleus</i>	Khochi	Common
14	<i>Cotesia tuski</i>	Unknown	Chvare	Rare
15	<i>Glyptapenteles</i> Ashmead	<i>Pyralidae</i> larva	Sangavade	Rare
16	<i>Glyptapenteles melentis</i>	<i>Otheris noctuidae</i> larva	Panhala	Rare
17	<i>Hypomicrogaster</i> Ashmead	<i>Papilio demoleus</i>	Minche	Rare
18	<i>Hypomicrogaster minari</i>	Unknown	Chikhali	Rare
19	<i>Meteorus dichlomeridis</i> Wilkinson	<i>S. oblique</i>	Ispurli	Common
20	<i>Meteorus spilosomae</i>	<i>S. oblique</i>	Jatharwadi	Common
21	<i>Apanteles angaleti</i> Muesebeck	<i>Pectinophora gossypiella</i> Saun	Kini	Common
22	<i>Apanteles prodeniae</i> Viereck	<i>S. derogate</i>	Nagaon	Common
23	<i>Apanteles papilionis</i> Viereck	<i>Papilio demoleus</i>	Karveer	Common
24	<i>Agathis india</i> G and B	<i>S. obliqua</i>	Top	Rare
25	<i>Bracon bravicornis</i> Wesmeal	<i>E. fabia</i> , <i>E. insulana</i> (Boisd)	Borpadale	Rare
26	<i>Bracon chinensis</i> Bhatnagar	<i>S. inferens</i>	Nandgaon	Rare
27	<i>Bracon hebator</i> Say	<i>Erias</i> sp.	Koparde	Rare
28	<i>Bracon gelechia</i> Ashmead	<i>Helicoverpa armigera</i>	Kerli	Rare
29	<i>Chilonus blackburni</i> Cameron	<i>Helicoverpa armigera</i>	Karveer	Common
30	<i>Chilonus heliope</i> Gupta	<i>Helicoverpa armigera</i>	Kaneri	Rare

31	<i>Diachasmimorpha longicaudata</i>	<i>Pyralidae</i> larva	Talsande	Rare
32	<i>Dolichogenidea mythimna</i> S. and B	<i>M. separata</i>	Dewale	Rare
33	<i>Dolichogenidea exiguvi</i>	<i>Helicoverpa armigera</i>	Kekhale	Rare
34	<i>Dolichogenidea lycoperci</i>	Unknown	Male	Rare
35	<i>Dolichogenidea sunflowari</i>	Unknown	Pargaon	Common

IV. RESULT

Result is recorded in table no 1. A survey of Braconid parasitoids total 35 species have been reported on February, 2020 to February, 2022 from Kolhapur region. Out of which 14 species were from the genus *Cotesia*. The most abundant species will be present in study area of genus *Cotesia* i.e *C. flavipes*, *C. ruficrus*, *C. orientalis*, *C. mangiferi*, *C. seasamae cameron*, *C. cameron*, *C. anari*, *C. arachi*, *C. brazari*, *C. chilo*, *C. janati*, *C. parnari*, *C. sunflowari*, *C. tuski*. The *Dolichogenidea* and *Bracon* total 4 different species are observed in study area, *D. mythimna* S and B, *D. exiguvi*, *D. lycoperci* and *D. sunflowari* and *B. bravicornis* Wesmeal, *B chinensis* Bhatnagar, *Bhebator* Say, *B. gelechia* Ashmeade

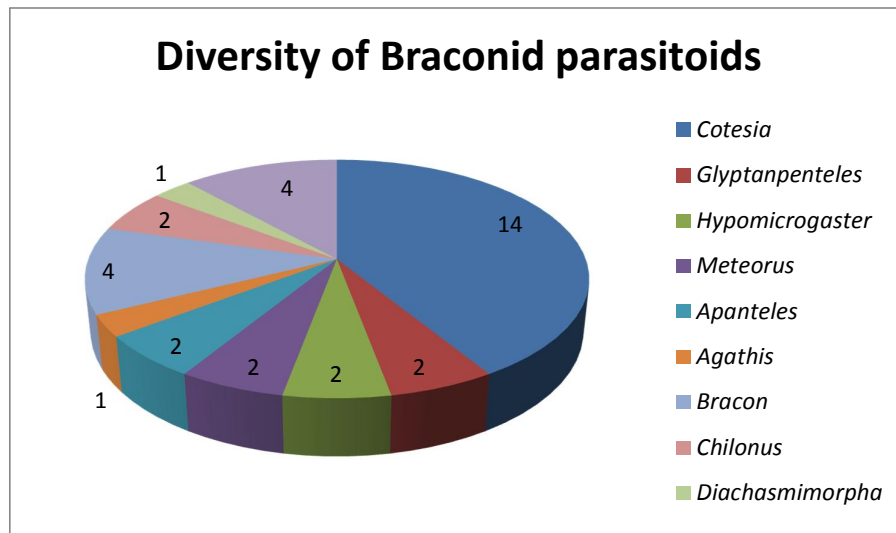


Figure 1: *C. ruficrus*



Figure 2: *C. ruficrus* Cocoons



Figure 3: *H. armigera* (Host of *C. ruficrus*)



Figure 4: *C. ruficrus*



Figure 5: *C. flavipes*



Figure 6: *C. Cameron*



Figure 7: *P. dempleus* (Host of *C. sunflowari*)



Figure 8: *Pyralidae* (Host of *G. melentis*)

V. DISCUSSION

According to Sathe (2004) out of 37 species of Braconids listed, the genera *Cotesia* and *Apanteles* were dominant from the genus *Cotesia* total 10 species are observed in study area and *Apanteles* total 13 species are reported. A total of 96 hymenopterous parasitoids were recorded on study area and 6 species are prominent families namely, *Ichneumonidae*, *Braconidae*, *Chalcidae*, *Eulophidae*, *Trichogrammatidae* and *Aphelinidae* (Sathe and Chougale, 2014). Total 35 species have been reported from different spots of Kolhapur district, Maharashtra. Sathe and Patil, 2016 have been reported total 25 species of the genus *Cotesia* from the Kolhapur region of Maharashtra (Sathe and Patil, 2016). In the present study 14 species of the genus *Cotesia* have been reported from the Kolhapur districts. The genus *Cotesia* is very important insect pest and their number is high. Genus *Cotesia* is dominant in number of species in the study area. The *Cotesia* species in pest control program gives better results and proves as eco-friendly pest control agents.

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