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Collection Methods of Chalcidoidea (Hymenoptera : Apocrita) Parasitoids and their Diversity in Pudukkottai District, Tamil Nadu

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Abstract: Diversity of Chalcidoids from Pudukkottai district of Tamil Nadu was investigated during 2016-2018. An attempt was made to survey possible parasitic fauna of Pudukkottai with more emphasis on Chalcidoidea of parasitic Hymenoptera in various agro ecosystems. On the total of 346 parasitic Hymenoptera were collected, out of which 158 were Encyrtidae. 64 belonged to Aphelinidae, 31 to Mymaridae, 26 to Eupelmidae, 29 to Eulophidae, 21 to Chalcididae, 11 to Euritomidae, three to Pteromalidae, two to Torimidae and one Trichogrammatidae. Within the ecosystem only chalcidoids could be recovered and it's represented by ten families. The status of chalcidoids is compared with world and Indian fauna and their biocontrol potential is discussed.

Key words: Parasitic hymenoptera, genera, ecosystem, chalcidoids.

INTRODUCTION

Pest management using pesticides has been a usual way to control pest by farmers all around the world in several years. Parasitic Hymenoptera is one of the entomophagous insects utilized for pest management and within Parasitic Hymenoptera, members belonging to Chalcidoidea, play a major role in bringing down pest population in nature. Among the parasitic Chalcidoidea the family Encyrtidae,

Mymaridae and or aphelinidae are important in the natural control of many insects and are internal, primary parasitoids on insect eggs especially Hemiptera. Huber (1986) published Host of mymarids. Pudukkottai are a major Forests here are extremely rich and diverse. Hence, the present study was undertaken to know about the availability of parasitic fauna especially the parasitic hymenoptera.

MATERIALS AND METHODS

Survey for collection of parasitoids was made between 2016 and 2018 in Tamil Nadu, in and Pudukottai district, (containing pineapple orchard, pepper, coffee, tapioca, cardamam, honey, coriander and rice are the main agricultural activity and non-crop area in hills consisting of various weeds) using only yellow pan trap, Sweep net and Host rearing according to Noyes (1982) Parasitoids belonging to the super family chalcidoidea alone were diagnosed up to family. The identification of specimens was done following keys and taxonomic literature provided by Lin *et al.*, 2007, Goulet & Huber (1993), Kumar & Khan (2010) and Kumar *et al.* 2011. All the collected parasitoids were preserved in 70 % alcohol and kept for deep freezer. Deposited with Entomology Department, Annamalai University, Chidambaram, Tamil Nadu.

RESULT AND DISCUSSION

Three collection methods were followed to collect 346 numbers of parasitoids from Pudukkottai district (Table 1 & Fig. 1). Among the different collection methods, Chalcidoidea was the dominant

superfamily. In this superfamily, yellow pan trap recorded more yielded (170 of parasitoids) than Host rearing (148 of parasitoids) and sweep net recorded (29 of parasitoids) respectively.

In yellow pan trap, Encyrtidae recorded highest number 39 of parasitoids, followed by Mymaridae and Aphelinidae observed 29 and 28 numbers of parasitoids respectively. Trichogrammatidae, Torymidae and Pteromalidae recorded most reduced number of parasitoid (1, 2 and 3 respectively).

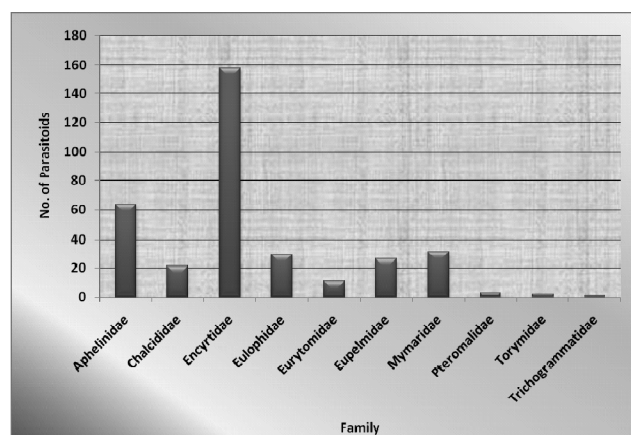


Figure 1: Number of Chalcidoidea parasitoid collected from Pudukkottai district

Table 1
Chalcidoidea Parasitoid Collected From Pudukkottai District (Different Collection Methods)

Sl. No	Family	YPT	SN	HR	Total
1.	Aphelinidae	28	6	30	64
2.	Chalcididae	18	2	0	21
3.	Encyrtidae	39	6	113	158
4.	Eulophidae	19	5	5	29
5.	Eurytomidae	8	3	0	11
6.	Eupelmidae	22	4	0	26
7.	Mymaridae	29	2	0	31
8.	Pteromalidae	2	1	0	3
9.	Torymidae	2	0	0	2
10.	Trichogrammatidae	1	0	0	1
	Total	170	29	148	346

This is in compared with the earlier reports, which showed that the maximum egg parasitoid through yellow pan trap followed by Host rearing reported Palnivel, 2017 and Krishna Chaitanya 2017. The above result conformity with Nalini and Manickavasagam, 2011 reported 11 encyrtid genera from different mealybugs. Hayat, 2006 reported 466 encyrtid from India. Yasumatsu *et al.* (1975) also reported four mymarid parasites *viz.*, *Anagnrus optabilis* (Perkins), *Mymar taprobanicum* Ward, *Polynema spand*, *Gonatocerus* sp., which contributed much in the reduction of plant hoppers in Thailand in rice ecosystem. Interesting to note here is that the entire mymarids population were collected by yellow pan trap collection system, which is very peculiar in all the ecosystems.

CONCLUSION

Since such a rich biodiversity of beneficial parasitic hymenoptera especially in chalcidoids available in nature, now it is upto the agricultural experts and farmers to suitably modify their plant protection schedule, so that their biocontrol potential fully exploited. They can live in advanced trophic level and this an important factor in maintain a suitable and stronger homeostasis in the ecosystem.

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