

Research Article



Documentation of Braconid Parasitoids of Pink Bollworm *Pectinophora gossypiella* on Cotton Crop at Southern Sindh

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Abstract | The experiment on documentation of braconid parasitoids of pink bollworm on cotton crop at lower Sindh was conducted during the cotton season 2016. The results found that maximum parasitoid mean population 175.85 ± 0.16 was recorded from Sanghar and lowest population 139.42 ± 0.45 from Umerkot district. The highest population was recorded in the month October. Highest number of *Bracon gelechia* found than other in all selected districts. Parasitoids were active during the month of November.

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Introduction

Cotton known as “white gold” an important economical cash crop in Pakistan. Besides being exported, a considerable part of the cotton is used by the local textile mills in the creation of garments and fabrics. Bale et al. (2008) reported that bio-control agents are important and long-time result for pest problems. (Sathe and Bhosle, 2001) reported that parasitoids are important biocontrol agents. (Ahmad, 2009) they reported some predators and parasitoids are suppress the population of cotton pest such as seven spotted beetle, *Geocoris* spp., zig zag lady beetle, and egg parasitoids *Trichogramma* spp and *Apanteles* spp. Wells et al. (2005) observed larval parasitoid *Apanteles* on bollworms of cotton. Sekhon and Verma (1983) biological control agents are known alternate to chemical and used successfully for the control of pests.

Studies on the natural enemies of the cotton bollworms have reported a great diversity of associated parasitoids. Approximately 150 species of bollworm parasitoids from 13 families have been recorded occurring in the America (Molina-Ochoa et al., 2003). Twenty-two species have been reported for Mexico, and species composition seems to vary throughout the country (Lina-Ochoa et al., 2004). There are thousands of species of Ichneumonidae; they are among the main parasitoids of Lepidoptera, although the specific hosts are unknown for most Neotropical species. Biological data are provided by Townes (2000), Gauld et al. (2002), Hanson and Gauld (2006) and Yu et al. (2005). A great deal of research is devoted to the study of natural enemies of lepidopterans of economic interest. However, studies relating parasitoids to their hosts and the plants on which they feed in the wild are rare. Biological data for Ichneumonidae reared from lepidoptera larvae are

provided by Braga et al. (2001) and Marconato et al. (2008), for Geometridae larvae feeding on Piper spp. (Piperaceae) and for Geometridae on *Erythroxylum microphyllum* (Eythroxylaceae). The Ichneumonidae are a part of biodiversity inventory of Lepidoptera caterpillars and their parasitoids found feeding on *Croton floribundus* Spreng (Euphorbiaceae). *C. floribundus* is a pioneer species widely used to allow caterpillar collections. There is a wide range of Lepidoptera species and Hymenoptera parasitoids (Marconato et al., 2008).

The aim of this experiment is to determine the braconid parasitoids of pink bollworm in lower Sindh region.

Materials and Methods

The experiment on documentation of braconid parasitoids of pink bollworm on cotton crop at lower Sindh was conducted during the cotton season from May to December 2016. Each month total 300 effected bolls were collected from the different location of cotton growing area as Umerkot, Mir Pur Khas and Sanghar. These bolls were brought at IPM laboratory, Department of Entomology, Sindh Agriculture University Tandojam and kept in plastic jars with three replications at maintained temperature and specimens measured within 24 hours to record parasitoid emergence. In collected bolls was determined as numbers of larvae and also observed parasitoid from dead larvae. After the emergence of parasitoids we considered only braconids parasitoids. These parasitoids were preserved in 70% alcohol for proper identification. The parasitoid specimens were sent for identification to the CABI Bioscience, Central and West Asia, Rawalpindi, Pakistan.

Results and Discussion

The results shown in Figure 1 the parasitoid population in different districts of Sindh Province. The data revealed that maximum overall mean population 175.85 ± 0.16 was recorded from collected bolls from Sanghar followed by 158.28 ± 0.70 Mirpurkhas and 139.42 ± 0.45 from Umerkot. The lowest parasitoid population was recorded during the month of May and highest population was found in the month October and November.

The results given in Figure 2 showed the population of Braconid sp. from the collected larvae of pink

bollworm at district Umerkot. Maximum population was found *Bracon gelechia* and minimum population was found *Apanteles angaleti*. Peak population of both parasitoids were recorded during the month of November and lowest population was found during the month of May.

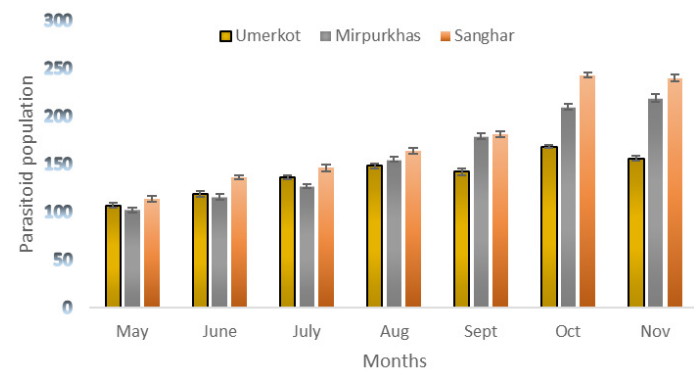


Figure 1: Parasitoid population during the months of May to November.

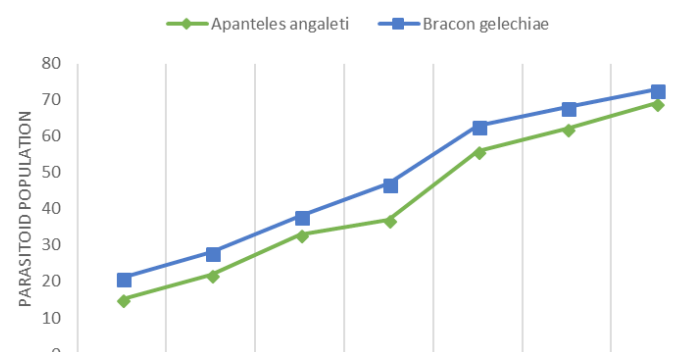


Figure 2: Population of Braconids sp. collected from Umerkot.

The results in Figure 3 showed the population of Braconid sp. at district Mirpurkhas. A maximum number was *Bracon gelechia* and the minimum was *Apanteles angaleti*. The population of both parasitoids species was increased during the month of November. Similar results were observed from the collected larvae of pink bollworm as maximum number of *Bracon gelechia* and minimum number of *Apanteles angaleti* was recorded at district Sanghar in Figure 4.

Present results agree with (Shah et al., 2011) who conducted surveys in different regions of Sindh province and reported that the attack of pink bollworm was occurred in the month of November. Various researchers have reported that peak population of *Pectinophora gossypiella* found during the month of October and November (Chaudhary et al., 1999; Guirguis et al., 1999). Muzaffar (1996) reported *Apanteles angaleti* and *Bracon gelechia* are major larval parasitoids of pink bollworm *Pectinophora gossypiella* in Pakistan. Similar studies Men et al. (2003) worked on diversi-

ty of parasitoids species and observed braconid parasitoids in cotton crop. Hafeez et al. (2006) reported peak population of *Apanteles* spp. during the month of October and November in cotton crop. Pilcher et al. (2005) and Dhillon and Sharma (2013) observed maximum population of Braconid spp.as compared to other natural enemies during cotton season.

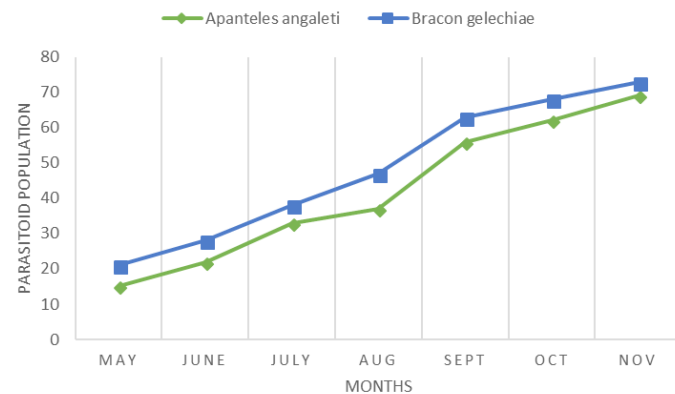


Figure 3: Population of Braconids sp. collected from Mirpurkhas.

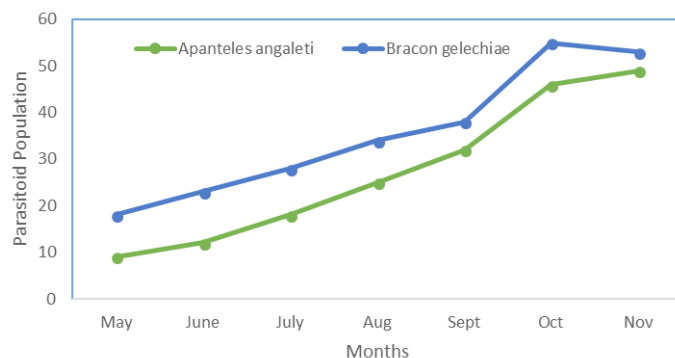


Figure 4: Population of Braconids sp. collected from Sanghar.

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Author's Contribution

I.A. Rajput: The idea data collection and overall management of the article.

A.K. Pathan: Reviewed manuscript.

A.M. Ahmed: Supervised the research, interpreted results and finalized the article.

M. W. Kalroo: Data analysis.

A. Q. Baloch: Plagiarism.

M.M. Shahid and F.A. Rajput: Technically helped.

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