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STUDY ON SEASONAL ACTIVITY OF PREDATORY WASPS ATTACKING HONEYBEE *APIS CERANA* FAB. COLONIES IN SOUTHERN BELT OF KASKI DISTRICT, NEPAL

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Abstract

A study was carried out at southern belt of Kaski District during Aug 2003 to July 2004 to study on seasonal activity of predatory wasps viz: *Vespa velutina*, *V. bicolor, V. tropica* and *V. basalis* were observed preying on *Apis cerana* Fab. in apiaries. Among them *Vespa velutina* and V. *bicolor* were the most abundant and common enemies of bees throughout the year. Peak predatory activity occurred to bees ranged from 1.25 to 12.25 per day during different months of the year, when must often coincided with the floral dearth period. Morning and noontime were peak time of attack than late day, which most often coincided with the activity of bees.

Key words: abundant, apiaries, bees, floral dearth, peak time, population

Introduction

Predatory wasps pose a serious threat to apicultural industry in different parts of the world. A persistent attack of predatory wasps weakens the bee colonies resulting in absconding (Gupta *et.al.* 1977). Many species of vespidae are serious enemies of honey bees and cause considerable damage (Mishra *et.al.* 1989). A survey by Walton and Reid (1976) revealed that in 1975-76 *Vespula germanica* destroyed 3900 colonies and affected more than 10,000 others. Akre and Davis *et.al.* 1978 reported that in Japan a group 30 *Vespa mandarina* was able to kill 25000 out of 30,000 bees in just three hours at the rate of one bee per hornet every 14 seconds. Sharma *et.al.* in 1985 found that wasp attack most often coincides with the floral dearth period and monsoon season. This is resulting in the depletion of colony strength and economically discouraging the beekeepers. The giant hornet (*Vespa magnifica*) and little hornet (*V. basalis*) were serious predators to honey bees in Nepal. In an apiary two individuals killed an entire colony of *A. cerana* in an hour (Thapa *et.al.*2000). The species composition and activity of the wasp is different in different time. Abrol and Kakroo in 1998 found that the wasps attack was peak during July to September which most often coincided with the floral dearth period and monsoon season taking a heavy toll of honey bee colonies particularly the foragers. The attack of wasp is also different in different time of the day. The activity of the wasp is maximum in morning and noon time than that of late day and evening. The abundance of different species of wasps varies from different areas of the country. It is necessary to find out the seasonal activity of wasps to adopt management tactics in peak period. The present study was undertaken to determine the species composition of wasps and their seasonal activity in Kaski District.

Materials and Methods

The study was conducted at three Village Development Committees (VDCs) Kristi Nachne Chour, Nirmal Pokhari and Pumdi Bhumdi VDCs of Kaski District during Aug 2003 to July 2004. Seasonal activity of different species of wasps predating upon honeybees, *A. cerana* were recorded in the apiary at weekly intervals at three different times of the day (7.00 to 9.00am, 12.00 to 14.00pm, 15.00 to 16.00pm) of three spots; one spot in each VDC in Sep\Oct, Dec\Jan, Feb\March, April\May, and Jun\ July. The number of wasp of each species was recorded. (Abrol and Karroo, 1998). The mean of three observations constituted one reading for each month. Different species of wasps attacking honey bee colonies were collected by using insect net and were preserved by pinning the specimens. Collected wasps were identified with experts and available specimens in Entomology Division of National Agricultural Research Council (NARC) Khumaltar, Lalitpur.

Result and Discussion

Four species of wasps were identified. Among them *Vespa velutina*, *V. bicolor* and *V. tropica* attacked the bee colony throughout the year where as *Vespa basalis* attacked from June/July to Sept/ Oct. An average number of wasps attack to bees ranged from 1.25 to 12.25 per day during different months of the year. The peak predatory activity occurred during July to September (fig-1). The peak populations of wasps observed during Aug to September. The *Vespa velutina* and *V. bicolor* were major predatory wasps in the study area as their frequency was very high in each month. The frequency of incidence of wasps was minimum in April/May that indicates that population of wasps was minimum because they may engage for nest building. The population of wasps was also minimum in Jan/Feb that is in the winter. That indicates the activity of wasp is reduced in cold climatic condition.

These wasps come in hive and wait the bees near the entrance when foraging bees come then they capture the bee and fly away. Abrol and Karroo in 1998 found the peak period of wasps attack occured during August to September and number of wasps on an average ranged from 0.10 to 13.58 per day during different months of year in Kashmir, India.

Thapa *et.al* in 2000 reported that *Vespa magnifica* and *V. basalis* were serious predators of honey bees in Nepal. But *V. magnifica* was not found there. Among *Vespa* species *V. basalis* is minor predator than others.

The frequency of incidence of wasp was more in morning (7.00-9.00 am) and noontime (12.00-14.00pm) where as incidence was minimum in late day (fig-2). The frequency is low or absent in the cloudy and rainy days which coincided with the activity of the bees.

Figure-1: Number of Vespa sps. Incidence in different months.

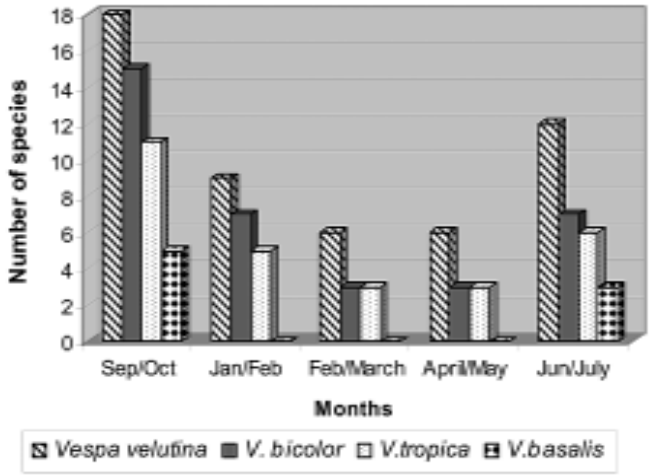
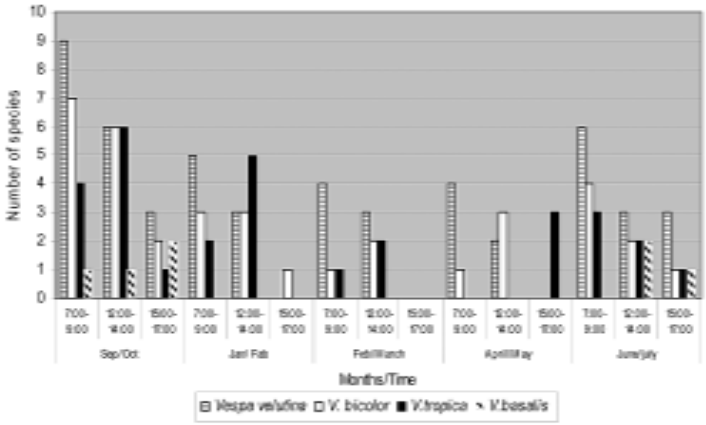


Figure-2 Number fo Vespa sps. Incidence in different months of different time.



Conclusion

Vespa velutina and *V.bicolor* were the major predators of *Apis cerana* in study area. They cause serious damage to bee colony. The persistent attack of wasp cause absconding of colony which ultimately affects economy of beekeepers. The peak predatory activity occurred during July to September which often coincided with the floral dearth period, when forage sources become limited. So, appropriate management tactics should be applied in the peak predatory activity. Morning and noon times were the peak diurnal activities of wasps. Control of wasps can be done by destruction of their nests. It can be done by using different baits like

chicken meat, mutton and fish. Wasps prefer dead, decaying and putrefied food materials containing alcohol but not the bees. This behavior of the wasps can be utilized for testing various baits as attractants. Physical killing of wasps by flapping can also reduce the number of wasps visiting apiaries. Combination of different methods will be effective for management of wasps.

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