

"STUDY ON SEASONAL ACTIVITY OF PREDATORY WASPS ATTACKING HONEYBEE
[*APIS CERANA*] COLONIES"

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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. *Vespa velutina*, *V. bicolor*, *V. tropica* and *V. basalis* were observed preying on *Apis cerana* 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, which 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.

Keywords: *Apis cerana*, predatory wasps, *Vespa*, peak time, abundant, population, Kaski

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 and Das 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 3,900 colonies and affected more than 10,000 others. Akre 1978 and Davis *et al.* 1968 reported that in Japan a group of 30 *Vespa Mandarina* was able to kill 25,000 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 dearth period and monsoon season. This is resulting in the depletion of colony strength and economically discouraging the beekeepers. The Giant hornet (*Vespa nutgnifica* Smith) 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 area. It is necessary to find out

the seasonal activity of wasps to adopt management tactice in peak period. The present study was undertaken to determine the species composition of wasps and their seasonal activity in Kaski district of Western Nepal.

MATERIALS AND METHODS

The study was conducted at three village development committees (VDCs) Kristi, Nachne Chour, Nirmal Pokhari and Pumdi Bhumdi VDC of Kaski District during Aug 2003 to July 2004, seasonal activity of different species of wasps predatory upon honeybees, *A. cerana* were recorded in the apiary at weekly intervals at three different times of the day (7.00-9.00am, 12.00-14.00 pm, 15.00-17.00 pm) of three spots one spot in each VDC in Asoj (Sep/Oct), Paush (Dec/Jan), Phalgun (Feb/March). Baisakh (April/May), Ashad (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.

RESULT AND DISCUSSION

Four species of wasps were identified. Among them *Vespa velntina*, *V. bicolor*, *V. tropica* attacked the bee colony throughout the year where as *Vespa basal* attacked from Ashad (June/July) to Asoj (Sept/Oct). An average number of wasp's attacks 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. The peak populations of wasps observed during Aug to September. The *Vespa velntina* and *V. bicolor* were major predatory wasps in the study area as their frequency is very high in each month. The frequency of incidence of wasps was minimum in Baisak (April/May) that indicates that population of the wasps was minimum because they may engage for nest building. The population of wasps was also minimum in Paush (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 was also during August to September and number of wasps on an average ranged from 0.10 to 3.58 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 spp.* incidence in different months.

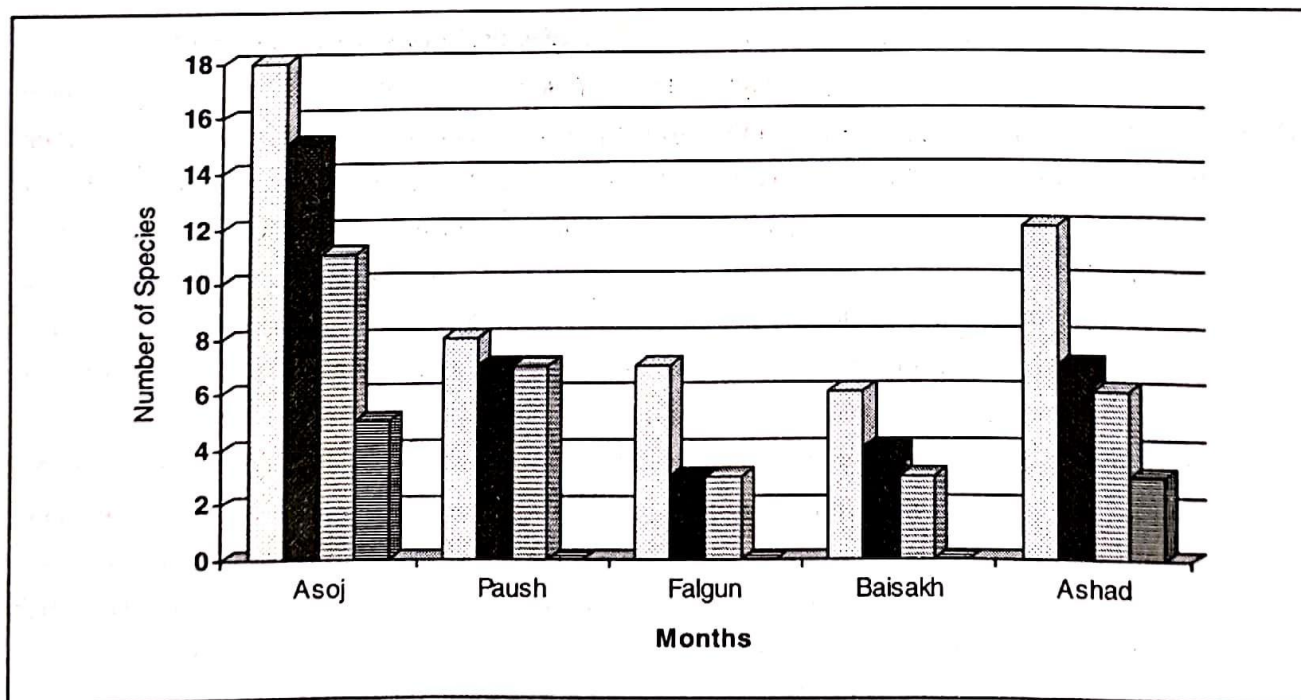
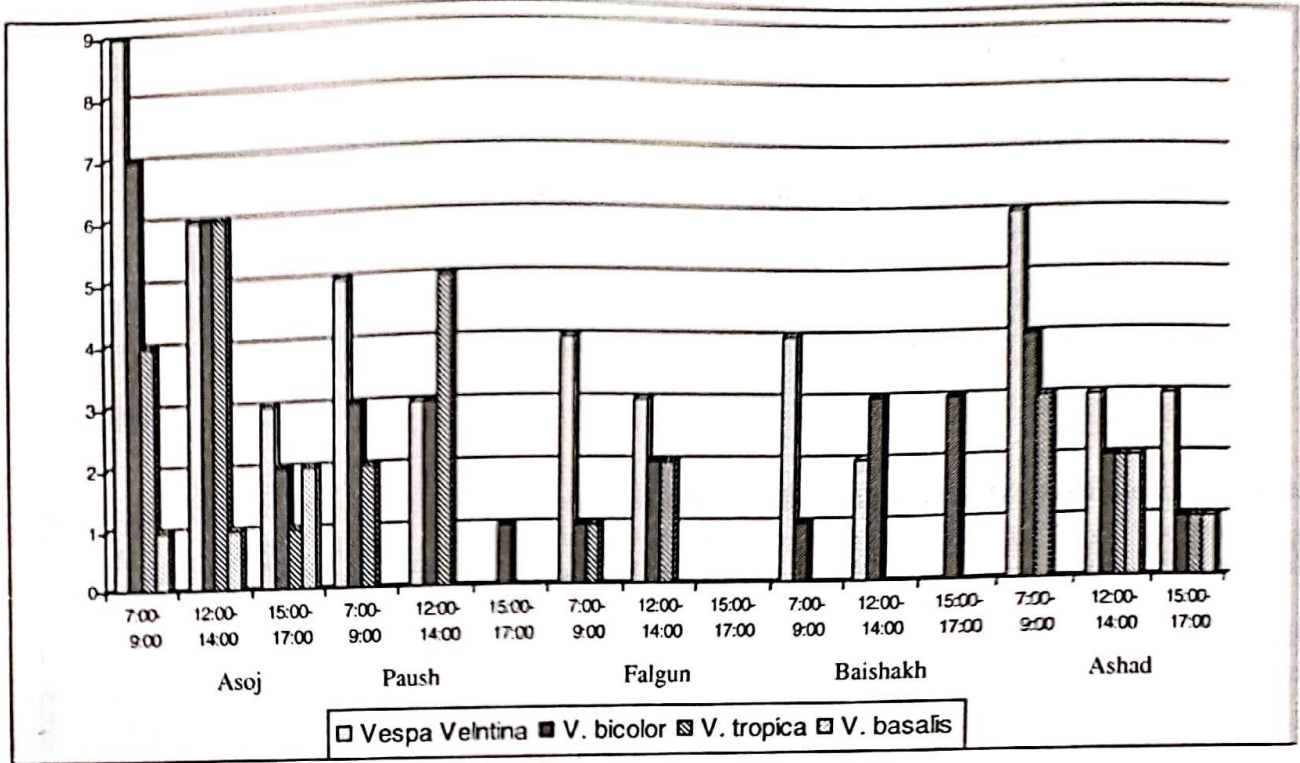


Figure -2 Number of *Vespa* spp. incidence in different months of different time.



CONCLUSION

Vespa velutina and *V. bicolor* were the major predators of *A. cerana*. They cause serious damage to bee colony. The persistent attack of wasp cause absconding of colony 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. The

morning and noon times were the peak ~~annual~~ activity of wasps.

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REFERENCES

Abrol, D.P. and S.K. Karroo, 1998. "Studies on seasonal activity and control of predatory wasps attacking honeybee colonies" Indian bee journal vol 60 (1) 15 - 19 pp.
 Akre, R.D. and H. G. Davis, 1978. "Biology and pest status of venomous wasps" Ann. Rev Entomol. vol 23:215-238pp,

Davis, H. G., T. P. McGovern, G. M. Eddy, T. E. Nelson, K.M.R. Bertun, M. Beroza, and J. C. Ingangi, 1968 "New chemical attractants for yellow jackets (*Vespula* spp) J. Econ. Entomol. vol 61:469-472 pp.
 Gupta, V.K and B. P. Das, 1977 "Distribution pattern of Indian vespidae (Hymenoptera) with special reference to altitude" Entomon 2 : 209-210 pp.

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- Mishra, R.C., J. Kumar and J. K. Gupta. 1989. A new approach to the control of predatory wasps (*Vespa spp*) of the honey bee, *Apis mellifera*. Indian J apic Res. vol 28:126-131 pp.
- Sharma, O.P; A. K. Thakur and R. Garg, 1985 "Control of wasps attacking bee colonies". Indian Bee J. vol 17: 27-29 pp
- Thapa, R.; S. Wongsiri and D. N. Manandhar. 2000. "Current status of predators and diseases of honey bee in Nepal" proceeding of the 7th international conference of tropical bees and 5th Asian Apiculture Association Conference 221-226 pp.
- Walton, G.M and G. M. Reid. 1976. "The 1975 New Zealand European wasp survey, New Zealand BKPR vol 38:26-30 pp.

