

OBSERVATION AND STUDY OF THE NESTING BEHAVIOR OF POTTER WASP,
DELTA DIMIDIATIPENNE (HYMENOPTERA: EUMININAE: VESPIDAE) IN KORADI
REGION NAGPUR DISTRICT, MAHARASHTRA

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Abstract

In the present work observed nesting and feeding habits of Delta dimidiatipenne (potter wasp). In which the Female wasp construct the nest by using wet mud and each nest have around 1 to 34 chambers and the average dimension of the chambers is 2.3 mm long and 1.4 mm in diameter (length range, 1.9-2.9 mm, diameter range 1.2-1.9 mm, n=20). In each chamber 1 to 4 caterpillars are stuffed according to their size. Adult wasp feed on the nectar or pollen but the newly hatched larva feeds on live caterpillars which are harmful to the crops. Wasp controls the population of insect pest and in this way the wasp acts as a natural bio-pest controller.

Key words: Potter wasp, Eumininae, Delta dimidiatipenne, Red wasp

Introduction

Delta dimidiatipenne solitary wasp belongs to the order Hymenoptera family Vespidae and sub family Eumeninae. Eumeninae are large group of cosmopolitan insects' approx 3,600 species and more than 200 genera (Pickett and Carpenter, 2010) are recorded worldwide. All the known Eumenine species are predators, and have different style of nest building. A potter wasp Delta dimidiatipenne (Saussure, 1852) is a widely distributed species and they are commonly found in Africa, Egypt, Afghanistan, Nepal and India. The Delta dimidiatipenne have been recorded in various parts of India, Van der Vecht and Fischer(1972); Binhhum (1897); Das and Gupta (1989); P. Girish Kumar (2014,2015); C. R. Deshmukh (2017).

Delta dimidiatipenne are identified clearly on basis of lower half of their frons and clypeus which are red in color and hence they are known as Red Wasp. The adult wasp feed on plant juice and nectar, but their offspring feed on live caterpillars therefore they are also known as caterpillar Hunter Wasp for studying nesting behaviour asp.

Material and method

Study Site – The study of nesting behavior of the above mentioned wasps have been done on few specific locations near Taywade College campus at Koradi region Nagpur District Maharashtra. The Nest were located on roof of the College building, garden area, dump yards, air conditioners, outlet boxes, window frame, door frame and nearby newly constructed houses and low and high shelters.

I collected around 40 new and old wasp nests from the research site and which were later brought to the laboratory for observation. During this observation I also observed the emergence of larva and their feeding habits.

Observations

It was observed that the Female wasp were in search of suitable places for constructing their nests. After finding suitable and safe place these wasps started to build their nests. Nesting activity of female wasp was seen from September and concluded at the end of November. The wasps were seen active again from February to the month of June. The activity of these female wasps used to start early in the morning and go on till sunset.

Female wasp constructed the nest by use of wet mud and sand. The female wasps used to collect wet mud and mix their saliva with the help of mouth part and formed wet clay balls. Then the Female wasp constructed the outer thin layer wall by wet clay balls in the form of letter "C" and after which it formed an oval shaped pot chamber. The oval pot shaped chamber had an opening till the time the female wasp stuffed it with sufficient food. The Female wasp layed 1 or 2 egg inside this chamber. The eggs are suspended to the roof by silk thread. The Female wasp hunt for a caterpillar from various sites like garden and fields. I observed the female wasp collect caterpillar mostly from cotton fields and beans plants. The Female wasp sting to the caterpillar and injects venom due to which the caterpillar's becomes paralyzed. Each chamber is filled with around 1 to 4 caterpillar and the wasp close the chamber with mud balls and start to build next chamber. The numbers of chambers varies from 1 to 34. I observed the highest numbers of chamber were 34. The chambers were seen in a single row but some few were overlapping. The average dimension of the chambers was 2.3 mm long and 1.4 mm diameter (length range, 1.9-2.9 mm, diameter range 1.2-1.9 mm, n=20) after completing the chamber work the wasp was seen plastering the outer wall by wet mud that is why the shape and total exact numbers of chambers are not clearly identified.

Nest enemies

I observed cuckoo wasp (Hymenoptera: chrysididae) and blue mud dauber wasps (Chalcididae) do more harm to the nest. Cuckoo wasp are known for parasitic life style and it lay egg inside the nest of potter wasp and their developing larva consumes the host eggs or young larva's and also consumes food stuff stored by host.

Female Blue mud dauber wasp trap a nest and make a hole into the nest with the help of mouth. Female wasp cleans the nest throws the eggs, larvae of potter wasp and stuff caterpillar outside the nest and lay egg into the chamber. Potter wasp hunt spiders and stuff inside the chamber as chamber filled with sufficient stuff the female wasp close the hole by some whitish mud ball and their larva feed on spiders.

I observed larval emergence of potter wasp from few undisturbed chambers' and larval of blue wasp from disturbed chambers of the same nest.



Fig. (A) Delta dimidiatipenne



Fig. (B) Wasp start to build nest



Fig. (C) Egg and prey inside the nest



Fig. (D) Nest of *Delta dimidiatipenne*



Fig. (E) Cuckoo wasp attack on nest

Reference

- Bingham CT.1897. The Fauna of British India, including Ceylon and Burma, Hymenoptera, I. Wasp and Bees: Taylor and Francis, London, 579+i-xxix.
- Girish Kumar and Gaurav Sharma 2014. Taxonomic study on vespid wasps (Vespidae:Vespoidea:Hymenoptera:Insecta) of Rajasthan, India with six new records from the state. Journal on new biological reports 3(3):240-258. ISSN 2319-1104
- Girish Kumar P, Sharma G. 2015. Taxonomic study on vespid wasps (Hymenoptera: Vespoidea:Vespidae) in Chhattisghar, India. J. Threatened Taxa. 2015; 7(14):8096-8127.
- Girish Kumar, P. (2012). On Delta dimidiatipenne (de Saussure, 1852) (Hymenoptera: Vespidae :Eumeninae) from India. Journal of Environment and Sociobiology 9(1):43-49.
- Das, B.P. and Gupta, V.K.1989. The social wasp of India and the adjacent countries (Hymenoptera:Vespidae). Orient. Ins. Monogr., 11:1-292.
- Deshmukh C.R. 2017. Taxonomic study of Potter wasp (Hymenoptera:Vespidae:Eumeninae) from Koradi Region Dist. Nagpur, India IJBAT, Special Issue(2), Vol-V, ISSN No 2347-517X
- Pickett, K.M. and Carpenter, J.M., 2010. Simultaneous analysis and the origin of eusociality in the Vespidae (Insecta: Hymenoptera). Arth. System. Phylog., 68:3-33.