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STUDIES ON NEST BUILDING AND PARENTAL CARE IN HYMENOPTERA (INSECTA)

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Abstract

Hymenoptera is the peculiar order of class Insecta for their living habits from solitary to eusocial life and accordingly the remarkable diversity in nesting behavior and parental care. In certain species of hymenoptera the individuals acquired the habit of living together in great societies as case of Vespidae and Apidae. These species included different tasks and their own characteristic specific functions including nest building, feeding and raising the brood and defense of colony. The brood care also found in solitary species of wasps and bees. They practices parental care with varying methods like 'mass provisioning' and 'progressive provisioning'. Thus the nesting behavior is coupled with parental care in all species of class. The present studies dealt with diversity in nests with respect to nest architecture, nesting material used. Various methods of parental care were also reported in this work. In general, the nesting behavior was found coupled with parental care. This study revealed diversity in nesting behavior and parental care in colonial and solitary wasps and bees. Thus the present studies on nest diversity were found significant to study intraspecific relationship like parental care in hymenopteran species.

Keywords: Hymenoptera, nesting behavior, wasps, bees, parental care

Introduction

The hymenopteran species show solitary, primitively eusocial and social life. In all cases the respective species has universal tendency to build the nest but with remarkable variations. The solitary species use the small and deep tunnels or holes of house holes and pin holes of electric switch boards. Similarly some solitary species construct cells and clumps of nest cells using clay and sand. The primitively eusocial and social species build their nests with varying number of cells made up of paper pulp and wax also. The present studies on nest building are needful to know diversity in nest architecture, the materials

used to construct and details of nesting behavior. The nesting behavior of solitary and colonial species is coupled with brood care. It is undertaken with varying strategic characteristics which are of great significance to study one of the intraspecific relationships of hymenopteran species.

Materials and methods

The study was carried out for a period of two years from June 2009 to June 2011. According to general habitats of hymenopteran species the nesting sites were searched in college campus, farm house and agriculture fields. Once the nest building were noticed in initial stages they were supervised daily and for some cases after half an hour interval up to sealing of the nests. The observations were recorded with respect to various parameters related with characteristics of nesting behavior and parental care. The specimens were collected and preserved with dry and wet preservation methods; identification of species was carried out with authentic references and photo database prepared.

Observations

The observations regarding nesting habits and methods of food provisions were recorded by supervising the nests and behavioural characteristics of the species. The observations are presented below:

Sceliphron violaceum: It is the solitary wasp species searches for cylindrical tubes available on the wall, pinholes of the electric switch boards as their nests. On select such secured sites it searches the spider, paralyzes it and brings it to the nesting site. After collection of sufficient number of spiders it deposits the egg on paralysed spider to meet the need of food of hatching larvae. Making this mass provision of food for broods is the entry site of pinhole. The mud-daubers; other species of *Sceliphron* are construct their mud nest as per the present observations contains ten to twenty nest cells arranged in a series. Each cell is loaded with paralysed spiders and sealed with same manner as case of *S. violaceum*. The Red potter wasp, *Eumenes conica* is the solitary species of wasps construct its nest with mud by collecting the mud in the form of mud balls and build cell wall from base towards the opening. The nest bears pot shaped cells in a short series. It also makes a mass storage of food by collecting depositing lepidopterous larvae (caterpillars) in each cell. It was also found that very soon as the nest cells are sealed. The Cuckoo wasps, *Chrysis ignita* parasitizes these nest cells. The Paper wasp, *Ropalidia marginata* is primitively eusocial species construct the colony using paper. The colony consisting hexagonal cells anchored to the support like wall or any unit on the surface of building or wooden articles with the help of stalk made up of paper pulp. The eggs are deposited singly in each cell at the base. The broods are attended by sitters (tended on the basis of behavior). Collection of the food and building materials is carried



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