

A NEW ENEMY OF THE INDIAN HONEY BEE

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Introduction. One of the obstacles for the rapid spread of apiculture as a cottage industry in South India is the presence of a number of bee enemies. The Indian Honey bee-*Apis indica* is often troubled by various enemies such as the Wax moth (*Galleria melonella*), the yellow banded wasp (*Vespa cincta*), the Death's head moth (*Acherontia styx*), ants, robber flies (Asilidae) not to speak of lizards, bugs, frogs, spiders, etc., which also levy a heavy toll. Recently a new enemy—*Palarus orientalis*—has been added to this formidable list and the present paper deals with the life history and habits of this wasp together with control methods for the same.

Description of the pest. *Palarus orientalis* belongs to family sphecidae, series sphecoidea, sub-order Petiolata of order Hymenoptera. The adult wasp is black in color with pale white transverse stripes on the dorsal surface of the abdomen.

The prothorax has basal transverse yellow line and the mesothorax two median longitudinal stripes. The metathorax has a pair of oblique yellow patches.

The female wasp is 12 mm. long with a wing expanse of 20 mm. The male is smaller in size than the female with a length of 9 mm. and wing expanse of 15 mm. A detailed description of the wasp will be found in Fauna of British India; Vol I; 1897 and in the Annals and Mag. Nat. Hist. Vol. 7 (1911) page 483.

Habits of the wasp. Both females and males appear during sunny hours of the day and perform a series of small flights from one place to another, copulation generally taking place at this time. Meanwhile the female pitches upon suitable places for digging tunnels. She sits upon the loose sand and begins to make holes by throwing up sand particles by the action of her legs and mandibles. She burrows into the sand and continues the process of throwing up sand particles. For some time the wasp is visible but as it goes deeper and deeper the loose sand from above falls into the narrow gallery thereby making it impossible to trace it. After finishing the burrow the wasp comes up making an opening in about an hour. First she flies to and fro with her head always towards the hole, then in circles with slight turnings, gradually widening them until, all on a sudden she changes her direction towards the hive. While going in search of prey, she does not close the mouth of her tunnel.

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Preying. The scene is now shifted to the hive entrance. The wasp sits upon the alighting board with its back towards the hive entrance and looks alert and busy by vibrating its antennae and wagging its abdomen. She attempts to pounce upon every flying bee. Generally it catches hold of outgoing bees. But bees with pollen loads have also been observed being made victims. Bees are held on the dorsal side, by the front legs of the wasp. Bees writhe and struggle for release, but they are incapable of stinging in that position. When the bees struggle much the wasp drops them down but in a few moments takes them up again.

Stocking bees. Within about 5 to 10 minutes the wasp returns to her tunnel with her victim. She hovers for sometime and dropping the bee just at the edge of the tunnel, shoots inside it and then drags it into the tunnel. After about 3 to 5 minutes she again appears and repeats the process of gathering bees. This she continues to do for a period of 1 to 1½ hours collecting as many bees as possible. Till that time the tunnel is left open; afterwards she pushes up some quantity of moist sand from inside to close the tunnel and remains in her nest for about 2 hours after which she reappears and begins preying in a similar manner as she did in the forenoon. Afterwards she goes inside the tunnel closing it once again. When the conditions are unfavourable the wasp stops the work temporarily and remains inside by closing the tunnel and the work is resumed after the expected bright weather starts again.

The tunnel. In the moist sand (below the loose sandy layer) there are three or four separate apartments or pockets about 3 to 4 inches apart from each other in which are stored groups of bees varying from 2 to 6 in number. All these lie within a surface area of one square foot.

The egg. In each group of bees there will generally be one egg deposited on one of them but sometimes none may be found in a group of even three or four bees. The egg is seen thrust between the head and throat of the bee, the free end curling a little over the ventral side of the thorax and passing between the front and middle legs. The egg is white in colour, about 3 mm. in length and 1 mm. in cross section.

The larva. The egg hatches on the second day and the small larva is more or less of the same size but its color is slightly dull. Naturally the grub begins to consume the first victim on whose body it hatches. It takes about two days to consume the first bee. In the first five days the larva feeds on all the bees in the pocket leaving only the outer shell of the abdomen, throat, head, wings and legs as remnants. The length of the full grown larva is about 15 mm. On the 6th day it begins to spin its cocoon and on the 7th day it completes spinning. Hence the active larval period is five days.

The cocoon is made of sand and the remnants of the bees. It is a neat oval shell about 12 mm. long and 3 mm. in cross section. In about two days the cocoon becomes hard.

The pupa. The pupa when fresh is pale white in color and later becomes brown. It is about 10–11 mm. long and $3\frac{1}{2}$ mm. broad. Adult wasps emerge from the pupae in due course.

How the wasp affects the bee colony. The loss caused by these predatory wasps is serious since each wasp is capable of robbing about 15–20 bees in a day. If there are more than one wasp preying in a day and if this repeated for a number of days the loss to the colony will be severe. Apart from the actual loss due to the visits of these robbers the routine work of the colony is disturbed. Most of the bees become guards and thus the number of bees going out foraging decreases. The colony therefore never works well and consequently brood rearing becomes slack. Moreover there is an increased tendency for bees to sting freely.

Localities. The wasp has been observed in the following places:—Tirur, Edappal and Ponnani in Malabar District; Tiruchengode in Salem District; and Telungapalayam in Coimbatore District.

Remedial Measures. One of the methods of dealing with the wasp is to locate its nest and destroy it. The location of the nest is not a difficult matter as the wasp as soon as it catches the prey carries it to the tunnel. The direction of its flight can be observed and the nest located without difficulty. It is also possible to handnet the adult wasps during the bright hours of the day. By these two methods the pest can be controlled satisfactorily.

THE STORY OF COFFEE

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According to some botanists, the Coffee plant is indigenous to Arabia, while some think that it may have been indigenous to Abyssinia and carried from thence to Arabia. Coffee is not mentioned in the Koran. It is believed that the Arabs knew of coffee only in the 14th century and even then it was probably viewed as a medicinal plant. It is also probable that the Arabs were then only preparing a decoction from the succulent rind or pulp of the coffee-cherry, which, as it contains sugar, was liable to ferment and become alcoholic on standing for some time. It was therefore associated with wine and so the zealous followers of the Prophet discouraged the use of it.

The art of roasting the coffee beans and making a decoction from this was probably discovered in Persia in the fifteenth century. A Mohammadan priest of Aden had an occasion to go to Persia where he