

PSEUDOSCORPIONS IN BEEHIVES IN INDIA

RECENTLY, a cheliferid (Arachnid) was noticed to occur in small numbers in beehives at Namkum, Ranchi. As far as the writers are aware, this appears to be the first record of a species of an arachnid inhabiting beehives in India. Although there are records of pseudo-scorpions occurring among bees in other parts of the world, the economic status of these creatures has not been investigated fully. Alfonsus¹ mentions *Chelifer cancrivorus* (the book scorpion) occurring sometimes in beehives in Germany, feeding on many species of mites, and suggests that this arachnid may prove to be of practical value in the control of acarine disease of bees. Hirst² records *C. sculpturatus* frequenting beehives in South and East Africa and says that 'there is no real parasitism, and insect hosts are used merely as means of transport, the chief food being mites'. In a foot-note following this paper, Mr. R. Whyte, a bee expert, questions the harmlessness of these pseudoscorpions among bees, as he noticed the young arachnids, while refusing honey or pollen, sucked up the juices of bee larvæ that had been injured in removing them from cells. Orosi Pal³ observed *C. cancrivorus* preying on larvæ of the wax moth, *Galleria mellonella* L., in Germany.

The full grown cheliferids, we have come across, are dark chestnut brown in colour, flattened, ovate, about 3.5 mm. long and with prominent pedipalps which are longer than the body itself. The pedipalp is provided with two finger-like joints for clasping. The cheliferids are capable of running swiftly, and usually move their pedipalps in the air, when excited. Different stages of this cheliferid have been noticed together in the same hive, mostly resting on the frames among the worker bees. They seem to shun light, as they are found to retreat under the frames, on opening the hive. They cling firmly to the legs of bees with the help of their pedipalps and thus get themselves transported. It is not an uncommon sight to find worker bees carrying about these arachnids attached to their legs. Not more than one cheliferid is found attached to a bee.

In the laboratory, the arachnid readily attaches itself to the leg of the bee, and in one instance it tried to feed by applying its mandibles in between the joints of the leg of the bee. In this case the bee appeared to be excited considerably. When supplied with medium-sized wax-moth larvæ, they fed on them by holding the caterpillars with their pedipalps. In one case, when a wax-moth larva and a worker bee were provided in the same cage, the arachnid preferred to attach itself to the leg of the bee, although it was starving. Cannibalism is quite common when different stages are caged together. It was interesting to note that hives harbouring these arachnids were free from wax-moths and mites.

The habits of these cheliferids are being studied, and the results will be published in due course. This note is intended to invite the attention of bee-keepers in India to these

creatures, which if proved harmful, will be a menace to bee-keeping in India.

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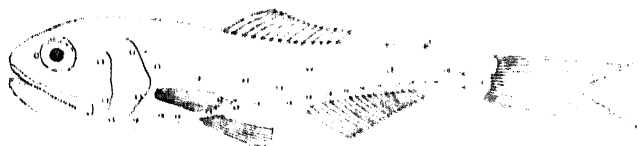
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September 19, 1946.

1. Alfonsus, A., "Bee World," Benson Oxon, 4, 2-3 (Abstract in *R.A.E.*, 1922, 10, 448). 2. Hirst, S., *Ibid.*, 36-37 (Abstract in *R.A.E.*, 1922, 10, 491). 3. Orosi Pal, *Z. Z. angew. Ent.*, 1938, 25, Pt. 1, 142-150 (Abstract in *R.A.E.*, 26, 661)

OCCURRENCE OF *MYCTOPHUM* SP IN BOMBAY HARBOUR*

Two post-larval forms of *Myctophum* sp. were found in a plankton sample from the Bombay Harbour on the 15th September 1944. One of the specimens measured 6.5 mm. and the other 14 mm. They had distinct photophores on the body arranged in rows (Fig. 1).



Myctophum sp. × 6

This luminous fish, to our knowledge, has not been described or reported previously from Bombay Waters. It is noteworthy that it was found only once in our plankton collections during the last ten or twelve years; it appears to visit the coast rarely, being perhaps a deep sea form.

Our specimens differ from *Scopelus indicus*, a single specimen of which was collected by Sir Walter Elliot at Vizagapatam and recorded by Day.¹ The publication of this note was postponed with a view to securing more material for the final identification of this species. Unfortunately identification has to be deferred as the forms did not occur for the second time in our collection.

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March 17, 1947.

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L. B. PRADHAN.

1. Day, "The Fauna of British India, Fishes," 1880, 1.

* Specimens occurred in the material collected for the research scheme carried out under the Imperial Council of Agricultural Research, New Delhi, and the Government of Bombay.

ON THE OCCURRENCE OF SCLEROSED PALISADE CELLS IN THE LEAF OF *NYCTANTHES ARBOR TRISTIS* L.

SYSTEMATISTS depend chiefly on the floral characters to distinguish one family from the other. Since the progress of anatomical research ample testimony is coming to show that anatomical characters too offer important

diagnostic clues in the identification of families. In the present case, namely, the investigation of sclereides in many genera and species of Oleaceae shows that these structures are typical and distinguishing features of this family.

The term Sclereid, meaning a hard protecting cell, is often used as synonyms with stone cell. The presence of Sclereids in the mesophyll has been reported in some members of Oleaceae, Ternstroemiaceae and Cappardiaceae, etc. Their presence is said to stiffen the leaf and according to Stevens (1924) they give hardness and toughness without being an impediment to increase in size.

The occurrence of elongated Sclerosed palisade cell or Astrosclereid seems to be very characteristic of the Oleaceae by which it can be readily distinguished from allied families. In this paper a short account of the occurrence of Sclereides within the matured leaves of *Nyctanthes arbor-tristis* L. is given.

Leaves are bifacial. The mesophyll is differentiated into palisade and spongy tissue. The noteworthy feature of the palisade parenchyma is the possession of Sclerosed palisade cells. Unlike the other members of the family where they show very varied types of differentiation, starting from columnar Sclerenchymatous cells to highly branched Sclerenchymatous fibres, the Sclerosed palisade cells of *Nyctanthes arbor-tristis* are short rod-like cells deprived of any growth. They lie either in isolation or loosely together *in situ* or sometimes a few cells in both the rows get converted into stone cells (Fig. 1). In the latter case they lie one above the other without being connected. One noteworthy feature of the Sclereides in their rod-like stature with thick lignified wall leaving a narrow lumen within the cell.

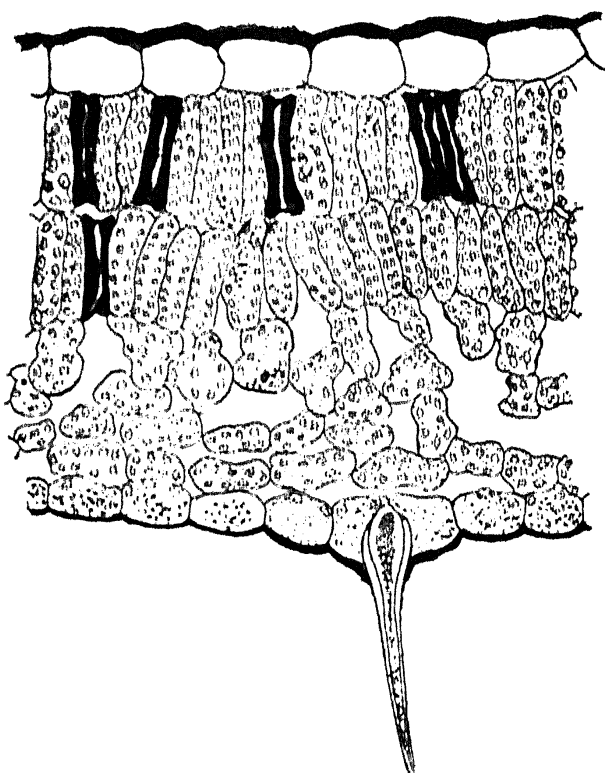


FIG. 1. Transverse section of leaf showing Sclerosed Palisade Cells.

Several instances of elongated columnar Sclerosed cells traversing the mesophyll have been recorded by Vesque and Pirotta (Boodle and Fritsch, 1908) in several species of *Olea*, *Linocera* and *Noronhia*. That Sclereid is the transformed palisade cell has been shown in *Olea dioica*,¹ where they traverse the mesophyll irregularly. The same feature is seen by the author in *Olea glandulifera*, *Olea europea* and *Olea cuspidata* and *Olea polygama* (detailed account will appear elsewhere).

The occurrence of short rod-like sclerosed palisade cell without the power of growth in *Nyctanthes arbor-tristis* is really very interesting. Thus these Sclereides form an intermediate stage between those non-lignified palisade cells and elongated columnar sclerosed palisade cells.

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January 23, 1947.

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1. Krishnaswamy, B. L., *Curr. Sci.*, 1942, **11**, 4. 2. Soreder's Systematic Anatomy of the Dicotyledons. Translated by L. A. Boodle and F. E. Fritsch Oxford University Press, 1908. 3. Stevens, W. C. *Plant Anatomy*, London, 1924.

NATURAL ACCLIMATISATION OF TWO SPECIES OF MULLET *MUGIL DUSSUMIERI* (C V.) AND *MUGIL OEUR* (FORSK.) TO FRESHWATER CONDITIONS ON THE NELLORE COAST¹

GRADUAL acclimatisation of certain Indian Marine and estuarine species of Mullet to freshwater has recently been reported by Devanesen and Chacko,² and Venkataraman.³ They collected fry from the sea and gradually lowered the salinity by replacing a quantity of salt water with freshwater daily. Thus within 3 to 5 days Devanesen and Chacko were able to acclimatise Mullet fry for stocking in freshwater tanks. Venkataraman found a prolonged course of 12 days suitable for *Mugil scheli*.

During the 1943 and 1944 seasons experiments were conducted at Woolapallem in Nellore District. Swarms of Mullet fry were observed to shoal about the estuarine area about full moon and new moon periods (4 days before and after spring tides) during the months of November to February the peak period being December and January.

The fry ascending the creeks with the rising tide were prevented by certain bunds from entering into freshwater courses. By cutting a passage the salt water from the creek and sweet-water from the fields were connected by a narrow neck. The fry then climbed upstream and remained sufficiently long in 'sweet-water' indicating their voluntary adjustment to complete freshwater under favourable temperature and pH of 79° F. and 8.1 respectively. When completely acclimatised in their natural ascent into freshwater the fry