

may be compared to the large "C" type of cells described by Clark² in the Polychæte *Nephtys*.

A second type of fewer, comparatively smaller cells, measuring about 30.98μ in diameter, with the cytoplasm uniformly filled with blue granules and distinctive axonic pathways, are also seen on the dorsolateral borders of the brain. These cells show no vacuoles. Two or three cells laterally, however, show a phloxino-philic cytoplasm.

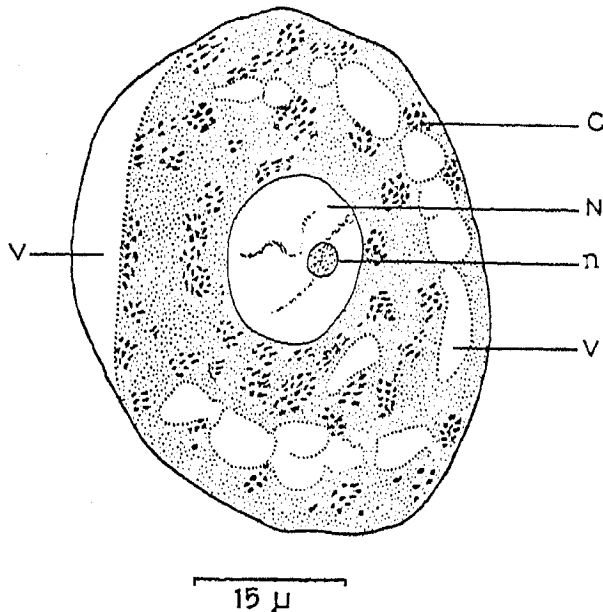


FIG. 1. Camera lucida drawing of a vacuolated type of neurosecretory cell from the brain of *Hirudinaria granulosa* (Sav.). Fixation: Bouin + Gomori's chrome alum-hæmatoxylin-phloxine. C = colloids; N = nucleus; n = nucleolus; V = vacuole.

An accumulation of blue colloids and granules is seen on the dorsal, outer periphery of the brain, where the latter lies contiguous with the ventral hæmocœlomic channel investing the nerve ring. This abundance of stainable material suggests a possible release of the neurosecretory colloids into the hæmocœlomic fluid. Such a condition is especially well marked in leeches which have been starving for a few weeks.

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OCCURRENCE OF *PARAPENAEOPSIS CORNUTUS* KISHINOUE IN THE SEAS OF INDIA

In July 1957, while making a routine collection of *Metapenæus monoceros* from Mahim, Bombay, a few specimens of *P. cornutus* were found mixed with those of *P. maxillipedo* in the catch of a drag net. *P. cornutus* is very much allied to *P. maxillipedo* but differs from it, in the absence of a basal spine on the third periopod of the female and in the possession of a typically boot-shaped endopodite on the second pleopod of the male.

The specimens range in size from 40-60 mm. The rostrum is sigmoid and dorsally armed with 6-7 teeth. Branchiocardiac sulcus present in both the sexes. Telson unarmed. Cardiac plate with 28-29 spinules. Zygocardiac ossicle with 5 teeth in the upper row, leading to a cluster of smaller teeth. The thelycum consists of a sub-rectangular anterior plate, covered with setæ on the distal half of the ventral surface and a posterior plate, which is bifid anteriorly. The distal projections of the petasma are long and slender. In male, the endopodite of the second pleopod is typically boot-shaped and is provided with a number of small setæ on the distal margin. In fresh condition, the body is faintly bluish with transverse brown straps on the abdomen. Uropods are purple red.

The species seems to be uncommon. The present description essentially agrees with the description of Dall (1957) and the important differences between the present description and the description of Kubo (1949) are of the gastric armature only.

Previously recorded in Australia (Dall), Japan (Kishinouye, Osada, Tanizaki and Nakazawa), Formosa (Maki, Tuchiya and Kubo), Java (De Man). This is the first record of the species in the Indian waters.

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Bombay-1, May 7, 1958.

1. Dall, *Aust. J. Mar. Freshw. Res.*, 1957, **8**, 215-17.
2. Kubo, *J. Tokyo Coll. Fish.*, 1949, **36**, 374-78.

ASSEMBLAGE OF TEN SPECIES OF COCCINELLID BEETLES ON BANYAN TREES AT KUNDRI FOREST IN BIHAR

SEVERAL instances of mass assemblage of various Coccinellid beetles, either in hibernation or in æstivation, from various countries have been reported. In India, Kapur (1943, 1954) has recorded mass assemblage of *Thea bisoctonotata* Muls. at Lahore, and *Epilachna bisquadri-*

1. Scharer, B., *The Hormones*, 1955, **3**, 57-95.
2. Clark, R. B., *Compt. rend. Acad. Sci. Paris*, 1955, **241**, 1171-73.
3. Herlant-Meewis, H., *Ann. Des. Sci. Nat. Zool.*, 1956, **18**, 185-98.
4. Scharer, B., *Naturwiss.*, 1937, **25**, 131-38.

punctata (Gyllenhal) in Chotanagpur. Mani (1954) observed *Coccinella septempunctata* L. at glacier beds of Lakka pass in Western Himalayas. Rao and others (1954) cite an instance of aestivation in large numbers of *Chilocorus nigritus* F. on Banyan (*Ficus bengalensis*) trees in Madras State.

The writers also observed a similar instance of an assemblage on a large scale of ten species of predaceous Coccinellid beetles on Banyan (*Ficus bengalensis*) trees at Kundri forest in Palamu Forest Division, Chotanagpur. This forest is almost a pure patch of naturally-occurring *palas* (*Butea monosperma*) trees numbering over forty thousand and is exploited for lac cultivation by the Indian Lac Research Institute. In addition to *palas* trees, a few other species of trees including some *Ficus* sp. also occur. The area is one of the hottest places in Bihar and the maximum temperature in summer goes up to 115-20° F.

Observations made between April and July in the years 1956 and 1957, indicated that this phenomenon was exhibited by 10 species of predaceous Coccinellid beetles and the beetles were invariably found on the Banyan trees on the under-surface of leaves and on the fruits. The Banyan trees were free from any kind of insect infestation and there was no food attraction for such an assemblage.

The species recorded in the order of abundance are the following:—

1. *Chilocorus nigritus* (F.).
2. *Cœlophora cardoni* Weise.
3. *Thea cincta* (F.).
4. *Pharoscymnus flexibilis* Muls.
5. *Scymnus nubilus* Muls.
6. *Scymnus coccivora* Ramakrishna.
7. *Catana parcesetosa* Sicard.
8. *Menochilus sexmaculata* Fabr.
9. *Synia melanaria* var. *rougeti* Muls.
10. *Stethorous gilvifrons* Muls.

The first-mentioned species was the most abundant of all and was observed in many hundred clusters, each cluster containing from 15-40 beetles. With the advent of the monsoons the beetles disappeared from the Banyan trees.

Observations made in January-February 1958, showed that five of the ten species mentioned above had congregated on the Banyan trees. In this season, however, the clusters and individuals per cluster were comparatively fewer in number, as indicated below in the collections made from lower branches of nine Banyan trees present in the area.

1. *Chilocorus nigritus* (F.) (271).
2. *Cœlophora cardoni* Weise (76).

3. *Menochilus sexmaculata* F. (14).
4. *Thea cincta* (F.) (2).
5. *Synia melanaria* Muls. (1).

The number per cluster ranged between 2-16. It was also noted that there was a definite tendency on the part of the beetles to get under protected situations such as, in between two leaves webbed together by spiders or within curled leaves.

As an explanation of this phenomenon, various theories have been advanced such as lack of food, urge to seek more equitable temperature and changes of physiological origin, etc. The fact that more than one species of beetles were found attracted to the Banyan trees which offered comparatively cooler environment in summer and less cold environment in winter seems to support the theory of urge to seek more equitable temperature.

Of the ten species recorded in this note, all except *Chilocorus nigritus* F. have been observed for the first time in India to be exhibiting this phenomenon.

The writers are indebted to Dr. A. P. Kapur, Zoological Survey of India, for kindly identifying specimens of *Cœlophora cardoni* Weise.

Indian Lac. Res. Inst., C. P. MALHOTRA.
Namkum, Ranchi, S. KRISHNASWAMI.
Bihar, March 22, 1958.

1. Kapur, A. P., *Indian J. Ent.*, 1944, 5, 165.
2. —, *Curr. Sci.*, 1954, 23, 230-31.
3. Mani, M. S., *Agra Univ. J. Res. (Sci.)*, 1954, 3, 13.
4. Rao, V. T., David, A. L. and Mohan Rao, K. R., *Indian J. Ent.*, 1954, 16, 207.

RESPIRATORY SYSTEM OF THE QUEEN OF *FORMICA FUSCA* L.

THE queens of Formicoidea dispose of their wings and generally these de-alated individuals use their fat body and the product of histolysis of the large wing muscles as food. The present note deals with the changes in the respiratory system as a consequence of the degeneration of flight muscles in *Formica fusca* L. The following interesting observations were made while engaged in the study of the respiratory system of Hymenoptera. It may be mentioned here that it takes over 2-3 weeks for the partial degeneration of the muscles. Briefly, the system of tracheæ and air-sacs in the thorax of the alated queen is as follows. The cervical tracheæ on entering the prothorax are connected by a transverse tracheal commissure. There are lateral air-sacs in the mesothorax. These extend dorsally in the meso-