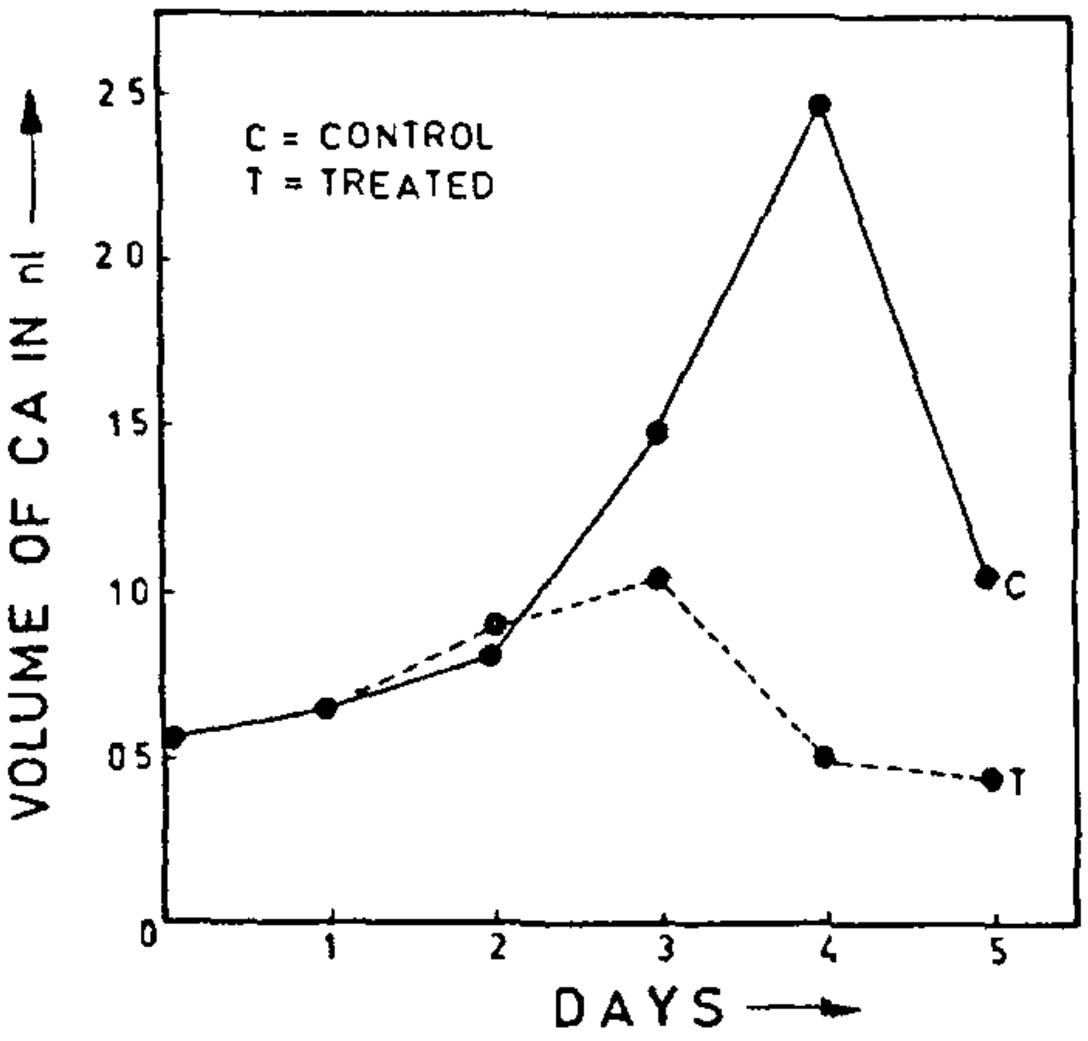


**Figure 1.** Graph showing the relation between the volume of CA and vitellogenesis in the control and treated adult. nl = nano litres.

leading to oosorption of the oocytes. Thus the juvenile hormone analogue hydroprene inhibited the secretion of JH by the CA. Hence we conclude that an optimum supply of JH is necessary for vitellogenesis and any variations in the titre of JH will lead to changes in the development of the oocytes.

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# ON THE INTRACEREBRAL NEUROHAEMAL ORGAN IN ADULT *POEKILOCERUS PICTUS* (ORTHOPTERA: ACRIDIDAE)

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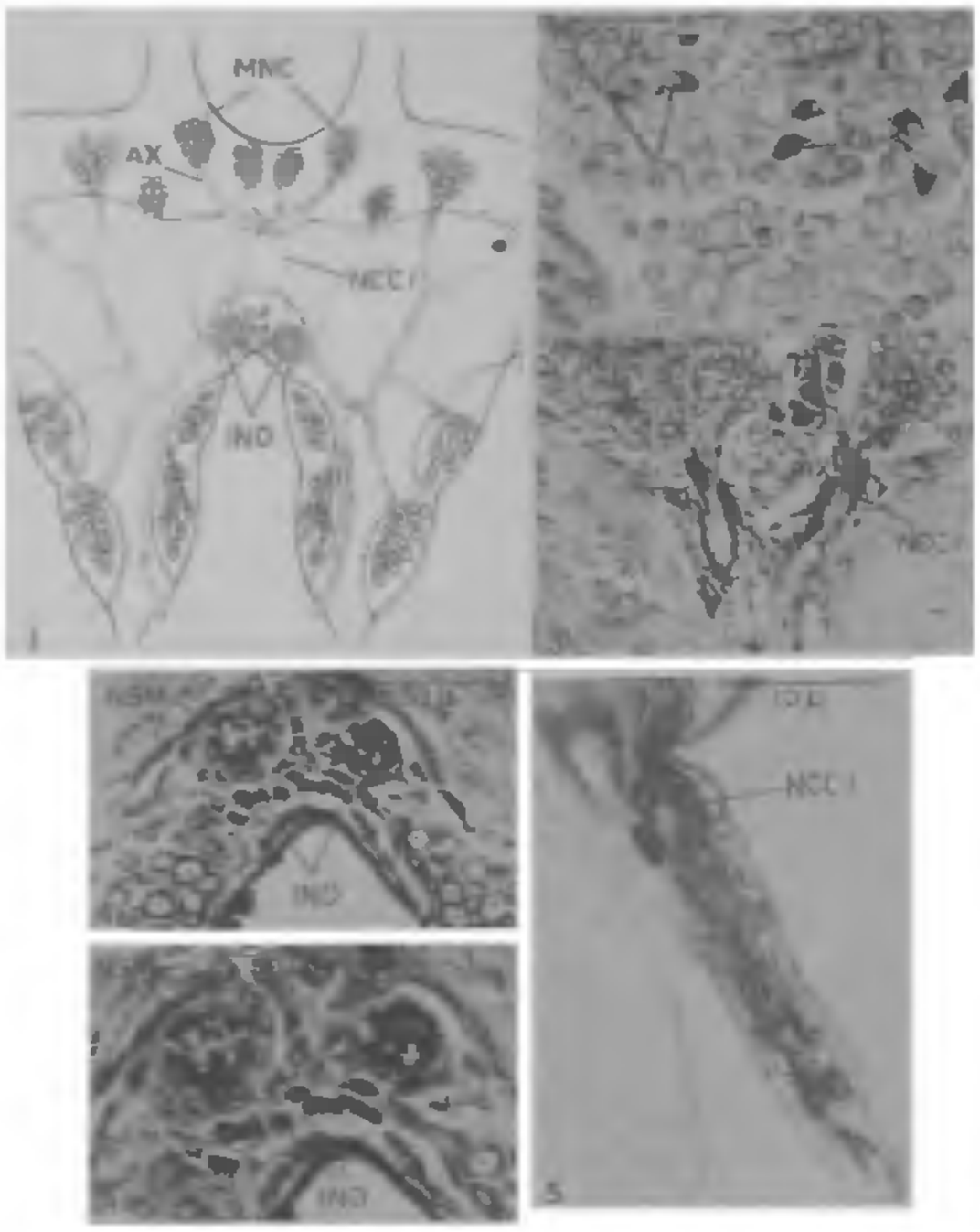
THE phenomenon of neurosecretion and types of neurosecretory cells in the brain of insects have been extensively studied[1]. Some description have mentioned the presence of neurosecretory droplets in the protocerebrum outside the paired axonal tracts[2]. Some times they are confined within the fine fibers which leave main axon tracts and re-enter after a short detour[3]. Some times the granules are present but the fibers are difficult to see[4]. The presence of neurosecretory granules in intracellular spaces has also been reported in *Carausius morosus*[5] and *Locusta migratoria*[6]. Here the amount of neuropilar neurosecretion is so much that the region has been called a reservoir. In the present investigation paired axonal tract from the median neurosecretory cells after decussation were seen entering in a circular structure situated on the ventral side of the tritocerebrum close to the neurolemma before leaving the brain. A brief description of this structure and its possible role as neurohaemal organ has been discussed.

Adult *P. pictus* of both sexes were picked from the stock reared in the laboratory at 28 ± 2°C. Their brains were dissected out in insect Ringer's solution and fixed for 18–24 hr in aquous Bouin's fluid. 6 $\mu$ thick serial paraffin sections were cut and stained with Paraldehyde fuchsin (PF)[8] and Chromehaematoxylin-phloxine (CHP) stains.

Four groups of neurosecretory cells, two on either side of the mid-line were seen in the median dorsal region of the parsintercerebralis (figure 1). They were distinguishable into two types, A and B, on the basis of their staining reactions (figure 2). The A cells stained purple with PF and blue black with CHP. The B cells were PF and CHP negative and took green and red colours of the counter stain of PF and CHP respectively.

Bundles of axon fibers arise from each group of NSC. Axons of the two group of each hemisphere unite and form Nervi Corporis Cardiaci (NCC I) on each side before entering the neuropile (figures 1 and 3). Axon tract of both side then cross one another and pass vertically downward. Each tract continues forward




**Figures 1–5. 1.** Diagram of the brain of *P. pictus* showing distribution of neurosecretory cells and their axon pathway. MNC, median neurosecretory cell groups; Ax., Axons; NCC I, Nervi Corporis Cardiaci I; INO, Intracerebral neurohaemal organ; NSM, Neurosecretory material. **2.** T. S. of brain passing through median dorsal region showing the presence of both A and B type cell. **3.** T. S. of brain. Note the neurosecretory axon arise from each group of NSC. Axon of 2 groups of each hemisphere enter into neuropile, unite and form NCC I. **4a.** T. S. of tritocerebral region of brain showing the circular space, heavily loaded with PF positive NSM. **4b.** Same highly magnified. **5.** F. S. of brain. Note the NCC I loaded with NSM, leaving brain.

and downward for a short distance and emerges from the neuropile on the ventral side of the tritocerebrum. Immediately after emerging from the neuropile the axon tracts enter into a circular space lying close to the neurolemma and taking very intense stain of PF and CHP (figure 4). Axon tracts after leaving this circular structure ran paralleled to the outer margin of the tritocerebrum and finally emerged out from the ventral surface of the brain (figure 5).

A closer examination of these circular areas revealed that these are membrane bound structures containing large number of PF positive big neurosecretory granules (figures 4a, b). NCC I was clearly observed entering and leaving this structure. PF positive clumps were seen all along the axon tracts giving the appearance of moniliform fibers traversing the neuropile. The staining behaviour and connection with the axon tracts indicates that these PF positive areas may be neurohaemal organs meant for the storage and release of neurosecretory material.

The amount of PF and CHP positive material in these organs showed variations at different times. Segmental neurohaemal organs have been described in the ventral nerve cord in *Phosmids*[8], *Periplaneta americana*[9] and in some beetles like *Chrysocorbus*[10] and *Dytiscus*[11], but in all these cases the neurohaemal organs were situated outside the ganglia. Occurrence of neurohaemal organs within the ventral ganglia has been reported in *Hydrophillus olevaceous*[12]. Fibres carrying neurosecretory droplets, leaving the intracerebral portion of the NCC I and ramifying through the adjascent neuropile before entering the axonal tract, have been observed in *Locusta migratoria* and have been designated as neurosecretory reservoir[7]. In *P. pictus* the occurrence of a distinct membrane bound, neurohaemal organ within the brain is a notable peculiarity and is being reported for the first time.

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