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Histopathology and Histochemistry of Insects Treated with Chemosterilants. VII. On the Corpora Cardiaca of *Periplaneta americana* (L) Treated with Hempa

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Damage to brain and reduced neurosecretion in Periplaneta americana (L) due to treatment with hempa, thio-tepa and bis (dimethylamino) dithiazolium chloride has already been reported by Saxena and Bhatnagar (communicated). In the present investigation the effect of hempa on corpora cardiaca of Periplaneta americana (L) is studied.

MATERIALS AND METHODS

.03 ml. of 3% hempa in sterile glass distilled water was injected into the last instar nymph of P. americana from the ventral side between the 3rd and 4th abdominal segment. The nymphs were autopsied after 24 hours of treatment. Sections of 6 were cut after fixation of the tissue in Bouin's fluid and were stained in standard paraldehyde fuchsin.

Normal Histological Structure - (Fig. No. 1)

In normal insect corpora cardiaca possesses the distended often bulbous endings of axons from the neurosecretory cells of the protocerebrum arriving by way of the two corpus cardiacum nerves. These endings are filled with neurosecretory granules. Some intrinsic cells apparently of nervous nature, with axon like processes are also present.

Histopathological Observations After Treatment With Hempa - (Fig. No. 2)

Lighter stain taken by corpora cardiaca of treated cockroaches indicated considerable reduction in neurosecretory granules. The intrinsic cells are also affected as they appear separated, leaving spaces between them.

DISCUSSION

In the endocrine system of insect the neurosecretion of the neurosecretory cells of the brain is received by the corpora cardiaca, which results in the release of brain hormone into the blood. The brain hormone stimulates the prothoracic gland to

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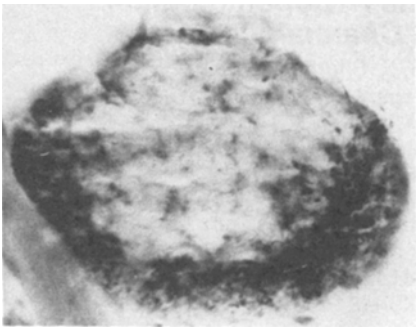

Figure 1

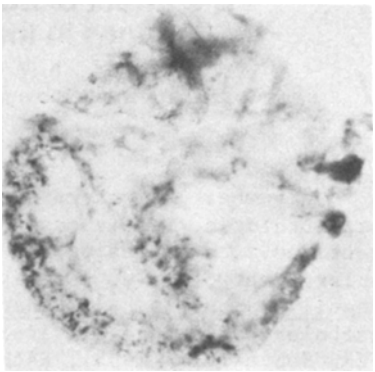

Figure 2

release ecdysone that causes the moulting. The reduced neurosecretory granules as evident by their light stain in histological preparation of corpus cardiacum of cockroaches treated with hempa indicate that the normal neurosecretion is not received by corpus cardiacum. This suggestion finds support from an earlier report of authors (Saxena and Bhatnagar, communicated) in which they recorded a fall in the secretion of neurosecretory cells of the brain as a result of the treatment with hempa. Thereby the normal neurosecretion does not reach the corpora cardiaca. The reduced neurosecretory granules in the corpora cardiaca and the damage to intrinsic cells are bound to affect the stimulation of prothoracic gland thereby the release of ecdysone, resulting in abnormal moulting.

It is thus suggested that the action of chemosterilants also lies in disturbing the endocrine system by affecting the secretion of the neurosecretory cells of the brain; hence the insect shows abnormal development.

SUMMARY

The neurosecretory granules are reduced and intrinsic cells are damaged in the corpora cardiaca of the last instar nymphs of P. americana treated with hempa.

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