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ENTOMOLOGY

Regulation of Water Economy in *Rhodnius prolixus*

In a previous report¹, the existence in insects (*Anisotarsus*, *Blaptica*) of a neurosecretory regulating circuit was postulated in order to explain the regulation of water economy. Later experiments with *Schistocerca cancellata*² did not confirm Ramsay's hypothesis, as proposed for *Aedes aegypti* (control by means of the peristalsis of the hindgut³), but could be interpreted on the hypothesis that regulation occurs by a direct modification of the excretory activity of the Malpighian tubes, although other hypotheses were not excluded.

	Water excreted as per cent of the water in ingested blood	Final volume of the lymph (mm. ³)
Decapitated	15.4 ± 3	45.2
Controls	51.7 ± 5.4	19
	n = 30	P < 0.01

The following results were obtained recently with *Rhodnius prolixus*: (1) Fifth-stage larvæ, decapitated immediately (10–20 min.) after feeding, retained in their hæmolymph after 24 hr. a greater amount of the water contained in the ingested blood (73 per cent) than the non-decapitated controls (42 per cent). Normal elimination of turbid excrements rich in sediments occurred in both decapitated and control larvæ. (2) Similarly decapitated larvæ and controls were parabolically attached at their heads. No reciprocal actions were observed. Transfusions also gave similar results. (3) The retention of water in the hæmolymph obtained by decapitation may be duplicated by plugging the anus. (4) If cannulated animals are used to avoid possible mechanical retention not due to the Malpighian tubes, the values given

Fig. 1. ○, Decapitated; ●, controls

in Table 1 were obtained, 16–24 hr. after feeding (and decapitation).

In Fig. 1, urine excretion (as percentage loss of weight of all the animals with respect to the amount of water contained in the ingested blood) is plotted against time.

Except for the inconclusive results given by parabioses and transfusions, the results reported here suggest that the disturbed water economy observed in the decapitated bugs is due to an abnormal functioning of the Malpighian tubes rather than to a simple modification of the peristaltic movements of the alimentary canal or to mechanical blocking of the anal spinneret.

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Identification of Geraniol as the Active Component in the Nassanoff Pheromone of the Honey Bee

HONEY BEES (*Apis mellifera* L.) attract each other by a variety of biological stimuli. The olfactory stimulus produced by the worker bees has received attention during a number of investigations ever since Sladen¹ suggested that the attractant odour originated from a special organ discovered by Nassanoff in 1883. This scent organ is located on the anterior part of the seventh abdominal tergum of the worker bee.

Sladen¹ observed bees at the hive entrance with their abdomens elevated, exposing the scent organs. The bees fanned air over the scent organs, thus dispersing the odour. Von Frisch and Rösch² found that foraging bees exposed their scent organs at flowers if these yielded an abundant supply of food. Because of the alluring effect which this secretion of the honey bee has on members of the same species it has been included in a group of biologically active substances termed 'pheromones'³.

A hive-specific body odour is usually superimposed on the scent from the Nassanoff organ. However, Renner⁴ obtained the Nassanoff pheromone free of interfering body odours by wiping the exposed scent organ with small bits of filter paper. He showed that the Nassanoff pheromone was not specific for race and colony.

Chemical identification of the active principle of the Nassanoff pheromone could have significant influence on modern agricultural practices dealing with insect pollination of fruit and seed crops.

The pheromone was absorbed on bits of Whatman No. 1 paper following Renner's wiping procedure. The scent obtained on the wipes from individual bees varied both in quality and quantity. Some wipes had a dry odour different from the sweet fruity odour characteristic for the normal wipes. Controls were prepared by wiping body areas other than the scent organ.

In two-choice olfactometer experiments more bees were attracted by odoriferous wipes than by controls. Wipes with dry odour attracted fewer bees than those with fruity odour, which indicated that the attractant principle of the Nassanoff pheromone was associated with its fruity odour.