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MORPHOLOGY OF SOME ROSTRUM RECEPTORS IN DYSDERCUS spp.

by

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INTRODUCTION

The rostrum of Hemiptera forms part of a highly specialized feeding apparatus. When a phytophagous heteropteron commences feeding activity the tip of the rostrum is the first mouth part to touch the substrate. Because in *Oncopeltus fasciatus* the first contact between rostrum and substrate seems to provide the insect with essential information, decisive for its further feeding behaviour (BONGERS, 1969), one would expect the presence of contact chemoreceptors on the distal end of the rostrum. Indeed some receptor-like structures are found here in the case of *Pyrrhocoris apterus* (COBBEN, 1953) and the present study describes their external morphology, as well as their innervation in *Dysdercus fulfoniger* and *D. koenigii*. No differences have been found between the two species with respect to the organs studied.

MATERIAL AND METHODS

External morphology, using the scanning electron microscope Jeol, JSM-U3, at an accelerating voltage of 25 KV, was examined on fresh insects or on specimens which had been fixed in gluteraldehyde, dehydrated and freeze dried. For transmission electron microscopy the tissues were fixed in glutaraldehyde and osmium tetroxyde, dehydrated in an ethanol series and embedded either in an Aradite-Epon mixture (MOLLENHAUER, 1964) via propylene oxide or in a styrene-methacrylate mixture (KUSHIDA, 1961). Sections were cut on a LKB Ultrotome III ultramicrotome with glass knives and stained with uranyl acetate and lead citrate.

OBSERVATIONS

When the apex of the rostrum of *Dysdercus* is viewed with a scanning electron microscope two symmetrical groups of setiform or peg-like receptors are discernable lateral to the stylet-groove (Pl. I). According

to their external form four different types may be recognized in each group. Type A comprises 10 blunt-ended sensilla basiconica which are about 20 μm long. At the tip a small cone surrounds the sensory pore. (Pl. IB). These sensilla are located in such a way that when the rostrum is lowered vertically they make the first contact with the substratum, except for 6–8 very slender long hairs which are implanted slightly more proximad. In contrast to all other sensilla described in this article sensillum A6 is clearly connected to the cuticle via a socket. Type B is represented by one thin sharply pointed hair, about 50 μm long and implanted at the ventral side of the labium. Usually it is slightly bent and pointing mediad. One small sensillum basiconicum with a sharp tip has been labeled as type C. Its length is approximately 10 μm. Its location on the edge of the entrance to the stylet tunnel results in a partly inward bent orientation of its longitudinal axis. The type D sensillum is a very short (about 5 μm) peg with a blunt tip. It is located at the lateral and slightly dorsal periphery of the group of sensilla.

The innervation of the sensilla described above is revealed by electron micrographs of transverse sections of the rostrum tip, such as Pl. II.

The cell bodies of bipolar neurons are situated near the basis of the sensillum they innervate. Their dendrites enter a scolopoid sheath which over a considerable part of its length is compartmentalized. Such structure, isolating the dendrites from each other, has also been found in some other insects, *e.g.*, in lepidopterous larvae (Schoonhoven & Dethier, 1966) and a coleopterous larva (Corbière-Tichané, 1970). The later author reports that sometimes two branches of the same dendrite become separated. The walls of the compartments may adopt bizarre foldings (Pl. IIID). The scolopoid sheath is connected to a pore at the top of the sensillum (Pl. IIIA). Near the apex the partitions disappear and the dendrites seem to branch occasionally (Pl. IIIB, C), as they do in some gustatory hairs of caterpillars (Schoonhoven & Dethier, 1966).

In the lumen of the sensillum fine filaments are found connected to the internal surface of the cuticle; their function in unknown (Pl. IIIA, B).

The number of neurons innervating the various sensilla is not uniform. The following distribution was found:

A1 and A3: 4 neurons
A2, A4, A5, A7, A8, A9 and A10: 3 neurons
A6: 5 neurons
B: 2 neurons
C: 3 neurons
D: 2 neurons