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RESEARCH COMMUNICATION

FURTHER OBSERVATIONS ON AN INTRATUBERCULAR SENSORY RECEPTOR OF *SCHISTOSOMA MATTHEEI*

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ABSTRACT

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A structure, presumably a sensory receptor in the nippled tubercles of *Schistosoma mattheei*, previously observed by scanning electron microscopy, was studied further by light and transmission electron microscopy. The results obtained by differential staining indicate that this structure does, in fact, consist of nervous tissue, and this provides additional evidence to support the sensory receptor hypothesis.

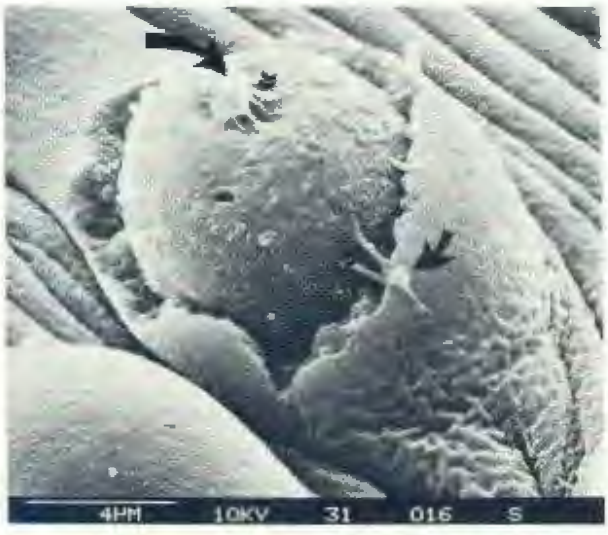

FIG. 1 Scanning electron micrograph from Kruger & Hamilton-Attwell (1985) depicting an intratubercular sensory receptor: × 6 000 (large arrow = terminal corpuscular process: small arrow = smaller corpuscles: arrow heads = nerve fibres)

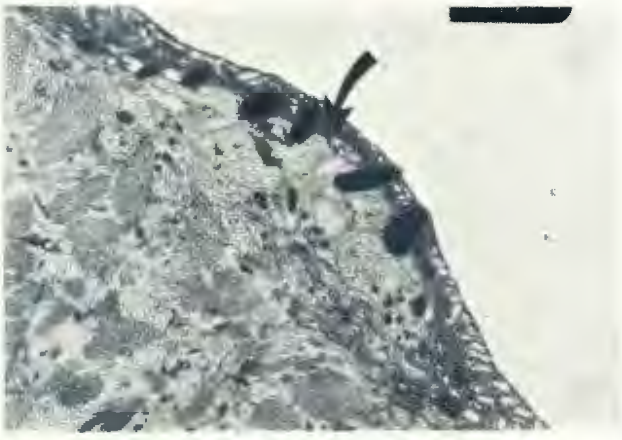

FIG. 2 Transmission electron micrograph of a longitudinal section through a tubercle: × 4 000 (arrow = terminal corpuscular process)

FIG. 3 & 4 Optical micrographs of longitudinal sections through tubercles differentially stained for nerve tissue: × 2 500 (large arrow = terminal corpuscular process: smaller arrows = nerve supply of process: arrow heads = nerve supply to presumably the smaller corpuscles)

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Kruger & Hamilton-Attwell (1985) described the morphology of a structure, presumably a sensory receptor, which they observed within the nippled tubercles of *Schistosoma mattheei* after the tubercle-tegument had been removed from an adult male by ultrasonication. They detected a terminally-located, corpuscular process connected to nerve-like fibres penetrating the basal lamina, and also smaller corpuscles likewise connected to nerve fibres (Fig. 1). Since these observations were made by means of scanning electron microscopy (SEM), only its surface could be examined and described.

In this communication, the morphology and function of this possible receptor are described in greater detail. Tranmission electron microscopy (TEM) was used for the ultrastructural study and light microscopy to distinguish nervous tissue in stained sections.

For the TEM study, whole adult *S. mattheei* male worms were fixed in Karnovsky's solution (Hayat, 1972) for 24–28 h, after which they were post-fixed in 1 % osmium tetroxide. After dehydration in an alcohol series of 70–100 %, samples were embedded in resin and then sectioned.

Nervous tissue was differentially stained by Cajal's method as recorded by Gatenby & Beams (1950). Fresh specimens were placed in a 1,5 % silver nitrate solution for 5 days at 35 °C, after which they were washed in distilled water for 2 min. They were then transferred to a reducing fluid containing 2 % hydroquinone and 5 % formalin for 24 h, after which they were washed again and hardened in alcohol for embedding in paraffin. Sections were cut at 10 μm, and examined and photographed with the aid of a light microscope.

It was found that the distal corpuscular process lies on the basal lamina and is embedded in the tegument (Fig. 2). The process has a ventral nerve projection which penetrates the basal lamina. As the process stains black with silver nitrate (Fig. 3 & 4), it may be assumed that it consists of nervous tissue. Silver nitrate staining also produced evidence of a nerve connection between the distal process and the deeper lying tissues (Fig. 3 & 4). There were also indications of an intratubercular nerve network connecting the distal process with corpuscles (Fig. 1), presumed to be sensory, and situated in the surrounding tegument (Fig. 3 & 4).

The results of this study support the hypothesis of Kruger & Hamilton-Attwell (1985) that the nippled tubercles of *S. mattheei* have a tactile function.

ACKNOWLEDGEMENTS

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