THE FORMATION OF THE ANTERIOR FEEDING APPARATUS IN DORYLAIMS

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The formation of the anterior feeding apparatus during moulting was studied in Labronema vulva-papillatum and Aporcelaimellus obscurus. A new terminology is introduced for the sectors in the nematode pharynx: perradial (previously marginal), adradial and interradial (both previously radial).

The form and structure of the cuticle of the odontophore and platelets depends upon the position of the secretory cells. In contrast to the body wall, the pharyngeal muscles (perradial and adradial) differentiate into secretory cells during moulting and are therefore considered as myoepithelial cells.

The odontostyle is formed by a single cell. Its form is determined by a vacuole, into which the stylet material is secreted and where it condenses in a complicated way. The shape of the vacuole is maintained by longitudinal fibres which form a kind of cytoskeleton. Migration of the replacement odontostyle is discussed.

The moulting process in dorylaims, and in particular the formation and replacement of the spear, was first described for Xiphinema by Coomans & De Coninck (1963) and subsequently for Aporcelaimellus and Aporcelaimus by Coomans & van der Heiden (1971). In the early stages of the moulting process, the replacement odontostyle migrates forwards and later becomes the functional odontostyle of the following stage. Simultaneously with the formation of the new cuticle, a new replacement odontostyle is secreted at the base of the functional one. Two stages can be distinguished in the formation process (cf. Coomans & van der Heiden, 1971): (1) the A stage during which the odontostyle is secreted, with five substages e.g. A1: tip formed; A3: odontostyle half-formed; A5: odontostyle completely formed; (2) the B stage during which the replacement odontostyle migrates posteriorly into the pharyngeal wall while it contracts and hardens. In first-stage juveniles, the replacement odontostyle is situated close behind the functional one as in more primitive Dorylaimida (see Coomans, 1975), but in the other juvenile stages, due to the backward migration in the B stages, the replacement odontostyle is situated far behind the functional one.

According to Chitwood & Chitwood (1950) the cuticular lining of the pharynx is formed by the marginal cells, but ultrastructural evidence for this is still lacking.

The terminology so far used for the different sectors and cells in the nematode pharynx, i.e. marginal and radial, is somewhat confusing and in-
complete. In fact, all pharyngeal cells seem to extend from the cuticularised wall of the lumen to the peripheral membrane surrounding the pharynx, so none is really marginal. Furthermore, the so-called marginal cells are situated at the end of the three radii of the lumen. In the literature the term 'radial' cells has not always been used in the same sense. Since all pharyngeal cells appear to be radially arranged (at least originally) and since a terminology to distinguish between the different cells and their position is desirable, we propose the terms perradial, adradial and interradial. These are already used for radially symmetrical organisms such as Scyphozoa and can be defined as follows (cf. Fig. 1): (1) perradius (per = through; radius = radius): each of the three primary radii of the nematode pharynx, comprising a radius of the lumen and the cell near its tip; (2) interradius (inter = between): a radius midway between two perradii (i.e. a radius of second order); (3) adradius (ad = to): a radius midway between perradius and interradius (a radius of third order). This terminology is better and less ambiguous. The so-called marginal cells, are now called perradial cells, the radial muscle cells become the adradial muscle cells while the pharyngeal glands are situated interradially.

Fig. 1. Diagram of symmetrical arrangement of tissues in nematode pharynx with suggested revised terminology.

In this study, using the transmission electron microscope (TEM) and the light microscope, we tried to find out more about the moulting process, especially the formation of the feeding apparatus and the migration of the replacement odontostyle.

MATERIALS AND METHODS

Moulting specimens and intermoults of *Labronema vulvapapillatum* and *Aporcelaimellus obscurus* were obtained from agar cultures (Wyss & Grootaert, 1977), fixed with 3% glutaraldehyde in Sorensen buffer, postfixed with 1% osmic acid, dehydrated in an alcohol series and embedded in ERL for TEM studies. Formalin fixed specimens, processed to anhydrous glycerin, and living specimens were used for observations under the light microscope.

Bars in the illustrations represent 1 μm, unless otherwise stated.