which has a molecular weight of 825.986 and which is a less satisfactory stain for the endospores has been shown to stain secretions from the amphids excretory pore of the L of M. incognita (Premachandran et al., 1988).

These arylmethane acid dyes are not toxic to the nematodes which will swim about in a dilute solution of BBG for several days without any apparent ill effects.

For convenience of application, the stain, which is only slightly soluble in cold water, is made up as a 1 mg/ml solution in distilled water, mixed with the aid of a magnetic stirrer for 1 hr at 22°C, centrifuged at 500 G for 15 min and stored in a 5 ml hypodermic syringe to facilitate dispensing. It is best used fresh although it is still effective after several weeks storage in the syringe at 22°C.

A drop of this stain is added to a drop containing the nematodes with adhering endospores and a coverslip is applied and sealed with nail varnish. The dye commences to stain the spores within a few minutes and intensifies over several hours showing them up in marked contrast to spores on unstained material (Fig. 1).

If an immediate count is required the nematodes may be killed by heating gently on a hot plate although this dye makes counting of spores on living material much easier.

Alternatively the dye, which is more soluble in alcohol than in water, may be made up in methanol : acetic acid : water (4 : 1 : 5) as recommended by Premachandran et al. (1988) for their histochemical studies on nematode secretions.

There is some confusion over the nomenclature of these dyes when the term Coomassie is used. In H. J. Conn’s Biological Stains (Lillie, 1977) BBG is listed as Coomassie Brilliant Blue G-250 and BBR is listed as Coomassie Brilliant Blue R-250. Both these dyes belong to the aminotriarylmethane group of dyes. However, the dyes Coomassie Fast Blue BL and GL, also known as Acid Milling Blue G, are quinone-imine dyes with molecular weights of 670.703 and 700.734 respectively. They also stain the endospores of Pasteuria penetrans but not as uniformly as does BBG. The arylmethane acid dyes are specific for protein and have been used to stain proteins fractionated by gel electrophoresis.

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Luc and Fortuner (1987) reviewed the family Dolichodoridae Chitwood, 1950 and the three genera comprising that taxon. They concluded Dolichodorus Cobb, 1914 and Neodolichodorus Andrassy, 1976 should be considered distinct and valid. The proposal of Brachydorus as a new genus based on its monotypic species, B. tenuis, described by de Guiran and Germani (1968), at first appeared justified, but the later description of B. swarupi Koshi, Raski & Sosamma, 1981 raised some questions. Its greater length (up to 2.3 mm), longer stylet (up to 35 μm), and shorter female tail (c’ = 3.8-5.0) were intermediate between the type species, B. tenuis, and the generic limits of Dolichodorus and Neodolichodorus. Besides, some species of both Dolichodorus and Neodolichodorus...
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chodorus had certain characteristics more closely resembling Brachydorus.

Recognizing the three genera are closely related, Luc and Fortuner (1987) nevertheless concluded Dolichodorus and Neodolichodorus represent distinct taxa, a concept supported by differences in configuration of the labial region and, mainly, shape and position of amphidial slits. Since no information was available on the labial region characteristics of Brachydorus they proposed the status of genus dubium for Brachydorus.

Recently SEM photographs of females, males and juveniles from the type population of Brachydorus swarupi have been obtained (Figs 1, 2) including the labial region and amphidial slits of each. These indicate Brachydorus is undoubtedly a distinct taxon separate from Dolichodorus and Neodolichodorus.

Material and methods

Nematodes were prepared for scanning electron microscope study as per the method described by Raski and Geraert (1986) except for Figs 1 B and 2 B, D. Those specimens were treated the same as the others up to the 100 % ethanol stage. At that point hexamethyldisilizane (HMDS) was added gradually a drop at a time at one minute intervals. Excess liquid was removed as necessary. After achieving 100 % HMDS the specimens were left for five minutes then allowed to dry at room temperature. Mounting on stubs and coating followed the same procedure as for above reference.

Fig. 1. Brachydorus swarupi Koshi, Raski & Sosamma, 1981. SEM photographs. A: Female, en face view; B: Juvenile, en face view; C: Female, lateral field about one-third of body length from anterior end; D: Juvenile, en face view; E: Female, vulva; F: Juvenile, lateral field, about mid-body (Bars equal : A, B, D: 2 \( \mu m \); C: 10 \( \mu m \); E, F: 5 \( \mu m \)).

Brachydorus swarupi Koshi, Raski & Sosamma, 1981

DESCRIPTION

Female: Labial region (Fig. 1A) shows the oral aperture to be a small elliptical opening dorsoventrally oriented in longer axis surrounded by six sensilla located in a slight depression. Labial disc raised, prominent, about 2.6 μm across, very slightly narrower on dorsal half; very faint superficial lines suggest labial disc is divided into six sectors, one each dorsally, ventrally and two each laterally. Amphidial slits prominent, oblique, about 1.5 μm long, beginning very close to labial disc at dorsal end then curving slightly, angling out ventrally.

Fig. 2. Brachydorus swarupi Koshi, Raski & Sosamma, 1981. SEM photographs. Male. A, B: En face views; C: Tail and caudal alae; D: Ventral view of anterior end (Bar equals: A, B: 2 μm; C: 20 μm; D: 3 μm).

and laterally from labial disc, slightly rounded at posterior margin; such a curvature creating a slight rounded lip-like dorso/lateral margin of the amphidial slit. Labial sectors fused, having a general aspect rectangular to squarish with rounded corners, with two distinct linear indents (one dorsad, one ventrad). De Guiran and Germani (1968) described the labial region of *B. tenuis* as smooth except for one weak striation setting off a single annulus at the very anterior tip; but, on South African specimens of *B. tenuis* (the only other record beside original one) De Waele and van den Berg (1988) described and illustrated the labial area has having four to five fine annuli. This has been confirmed in examining type material of *B. tenuis*. Koshi, Raski and Sosamma (1981) reported the labial region of *B. swampi* as smooth; however SEM photographs of *B. swarupi* proved the presence of transverse striae on labial region. Lateral view of male (Fig. 2 D) described below confirms this. Lateral field as illustrated (Fig. 1 C) marked by four longitudinal lines with transverse striae extending across the field, each striation separated by distance twice that of corresponding body striae. Vulva a simple oval (Fig. 1 E) slightly curved posteriorly, posterior margin rounded, lip-like.

**Male**: Similar to female but amphids more simple, oval slits (Fig. 2 A, B). Labial sectors fused only slightly rectangular to squarish; slightly more indented on dorsal and ventral margins than in female. Figure 2 D shows presence of at least five transverse striae on labial region extending up to labial plate. Tail (Fig. 2 C) shows lateral field similar to adult female and numerous fine striae on caudal alae.

**Juvenile**: *En face* similar to female (Fig. 1 B, D) but labial disc even narrow on dorsal half; lines setting off sectors slightly more discernable than in female. Lateral field (Fig. 1 F) with four lines, transverse lines cross lateral field at same intervals as body striae, occasionally only partial striae between middle two longitudinal lines.

**DISCUSSION**

The genus *Brachydorus* appears to be intermediate between *Dolichodorus* and *Neodolichodorus*, more closely related to *Dolichodorus* by virtue of its prominent labial disc, elongate amphidial slits, post-anal phasmids and longer tail. On the other hand it has the characteristics of *Neodolichodorus* in its lateral field with four lines. It is possible all the species included in the three genera represent a single, variable taxonomic unit or their relationships might better be expressed as subgeneric units under a single genus.

However, the arguments stressed by Luc and Fortuner (1987) led to the conclusion that *Dolichodorus* and *Neodolichodorus* are separate genera. The new evidence for *Brachydorus* presented above does not weaken or negate that decision. In fact, the unique amphidial slits structure of *Brachydorus swarupi* is clearly different from those of both *Dolichodorus* and *Neodolichodorus*. Therefore it is recommended *Brachydorus* be recognized as a distinct and separate taxon and removed from the status of genus *dubium*.

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