Nematol. medit. (1988), *16*: 171-174

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MORPHOLOGICAL CHARACTERISTICS OF *SCUTELLONEMA BIZANAE* FROM CHINA

by
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Summary. The original description of *Scutellonema bizanae* Van den Berg *et* Heyns, found in grape (*Vitis vinifera* L.) and apple (*Malus communis* L.) orchards in the Henan province of P.R. of China, is amplified and supplemented. Particularly, the most important diagnostic external features are illustrated. Longitudinal striations on the basal lip annulus and areolation on the lateral field at the level of scutella are illustrated in scanning electron microscope (SEM) micrographs.

Van den Berg *et* Heyns (1973) described two species of *Scutellonema* Andrassy (*S. bizanae* and *S. multistriatum*) and differentiated these species by spicule length (29.8- 31.3 μm and 22.1-27.6 μm respectively) and body annulus width (1.8 vs 1.1 μm). Germani *et al.* (1985) in a revision of the genus *Scutellonema* examined type material (2 ♀ and 1 ♂ of *S. bizanae*) (3 ♀ and 2 ♂ of *S. multistriatum*) and in view of only minor differences between the two populations they consider them synonyms.

In November 1984 a bisexual species of *Scutellonema* Andrassy, 1958 was extracted from soil samples collected in grape (*Vitis vinifera* L.) and apple (*Malus communis* L.) orchards in the Henan province of China. Study of 45 females and 5 males confirmed that the species is conspecific with *Scutellonema bizanae* Van den Berg *et* Heyns, 1973. The presence of *S. bizanae* in China in the rhizosphere of cultivated plants extends the host and distribution record for this species which was previously known to occur only in South Africa from where it was originally described.

This article extends the known range of variability of the principal descriptive characters while the most important diagnostic external features, longitudinal striations on the basal lip annulus and areolation of the lateral field at the level of the scutella, are illustrated by scanning electron microscopy (SEM) observations.

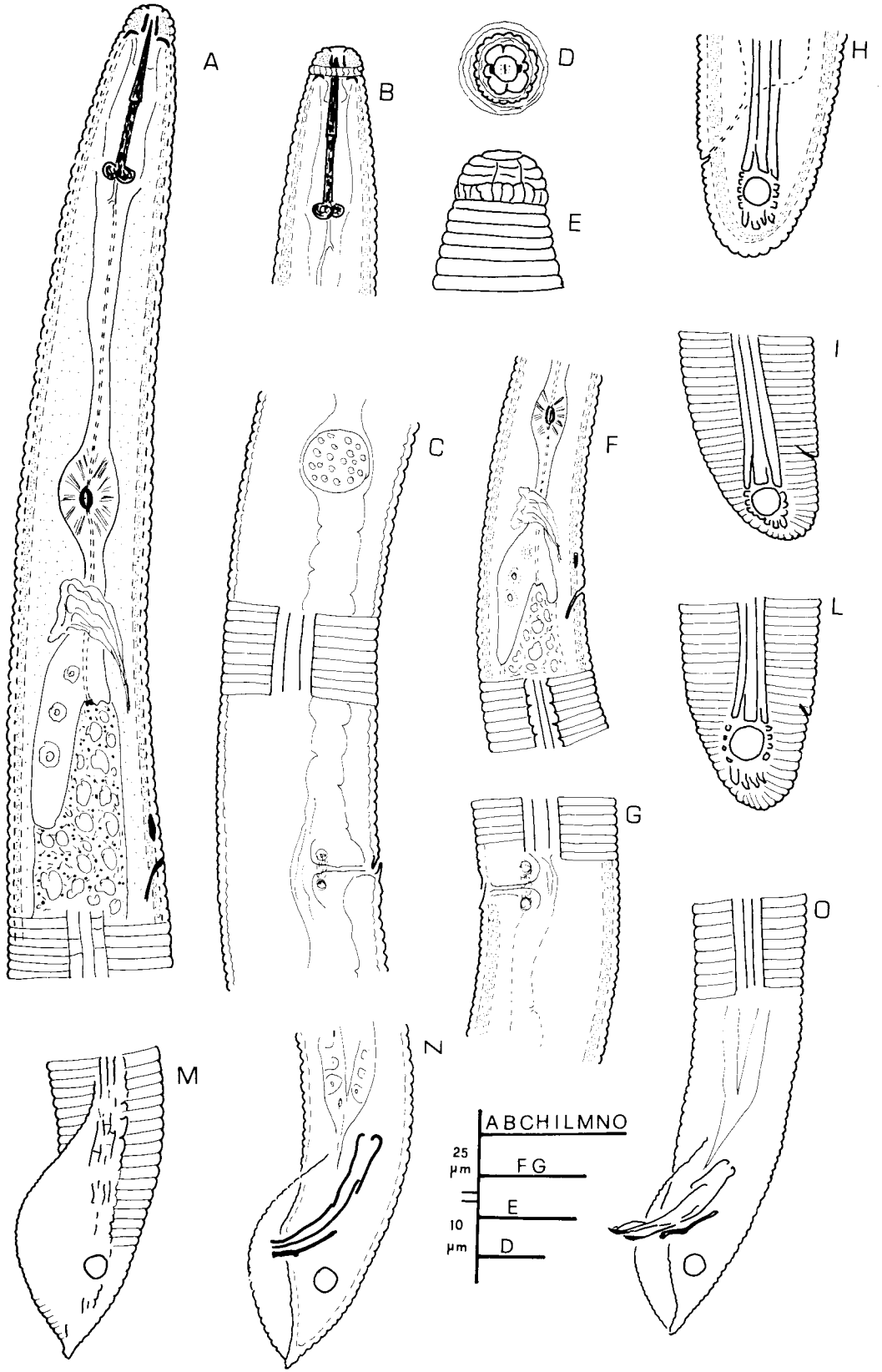
Materials and methods

Specimens were killed and fixed in hot aqueous solution of 4% formaldehyde plus 1% propionic acid, dehydrated slowly in an ethanol saturated chamber and mounted in dehydrated glycerine (see Southey, 1970 for general techniques). Several specimens after fixation were transferred to 1% osmium tetroxide (OsO_4) solution for 12 hours and then infiltrated with Spurr's resin by the method of De Grisse (1973). Glycerine mounted specimens were also used for SEM observations. These nematodes were placed in ethanol solution of glycerine (5%) for 12 hours, then rinsed several times with ethanol and infiltrated with ethanol-miscible Spurr's resin. All specimens, after vacuum gold coating, were observed by SEM at an accelerating voltage of 5 kV and microphotographed.

Description of Chinese specimens of *Scutellonema bizanae* Van den Berg *et* Heyns

Female (n = 35) L = 836 (750-900) μm; a = 27 (23-30); b = 7.0 (6.3-8.4); b' = 5.8 (5.3-6.6); c = 58 (50-67); v% = 59 (57-65); stylet length = 28 (27-29) μm; tail length = 14 (13-15) μm; tail annuli = 12 (11-14).

Body cylindrical, curved ventrally to varying degrees; width 28 (26-32) μm. Cuticle distinctly striated with annulus 1.9 (1.8-2) μm wide at mid-body. Head set off from the body, hemispherical, width (9-9.5) μm; height (4.5-6) μm with a terminal disc and four transverse post-labial annuli. Basal head annulus divided into 20-24 (variable in size) segments by longitudinal striae (Figs 1D,E; 2a,c). The other head annuli are divided into six sectors by longitudinal striae, the lateral being smaller than the subdorsal and subventral (Fig. 2c). The I-like opening of the prestoma is centrally located on the rounded oral disc. The oral disc is slightly raised and clearly separated from the six sectors of the first head annulus. The lateral sectors being smaller than the subdorsal and subventral sectors (Figs 1D, 2d, 2l) confirms the typical arrangement of the hoplolaimid face view (Vovlas,1984). Conspicuous ovoidal amphidial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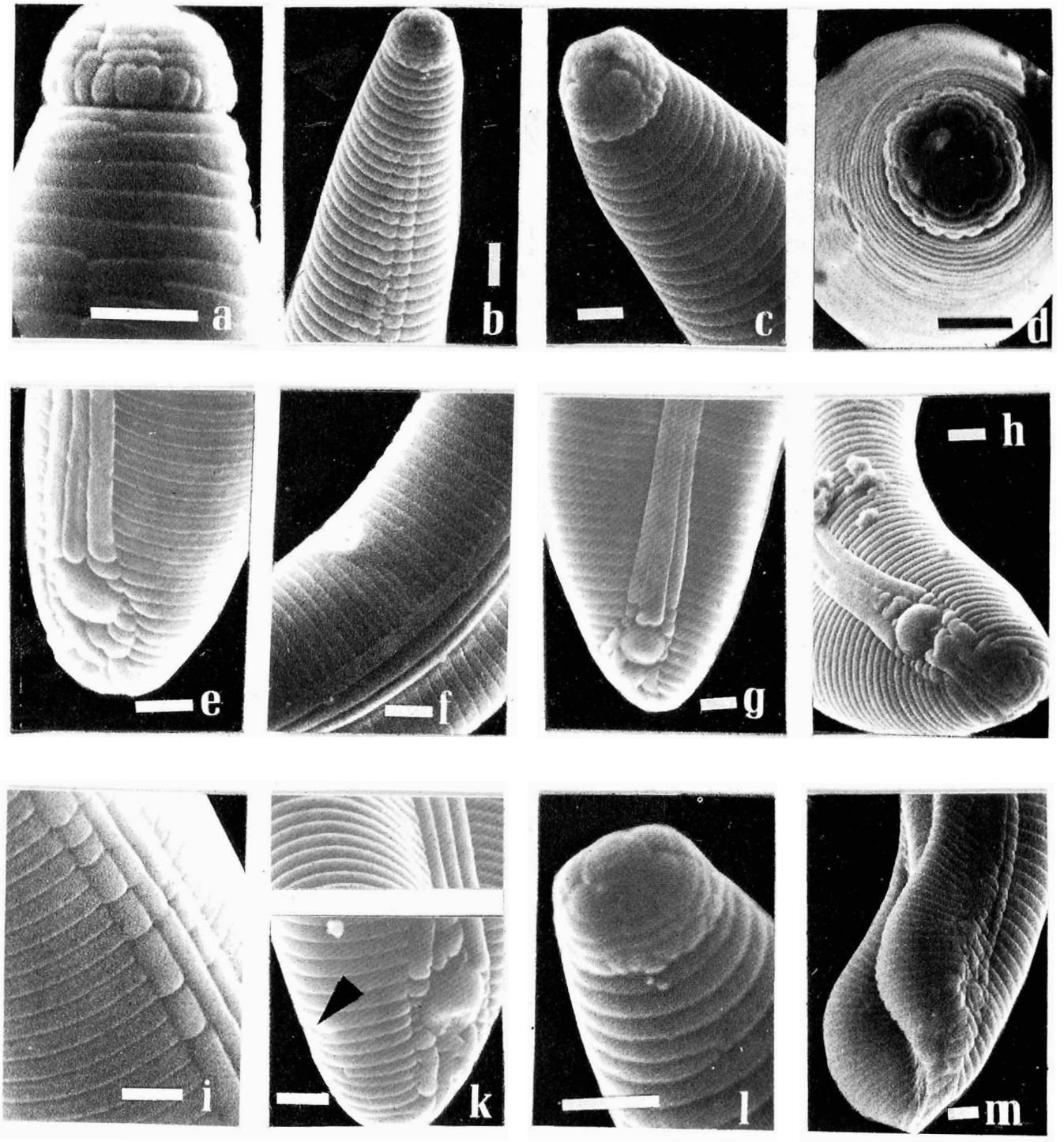

Fig. 2 - SEM photomicrographs of *Scutellonema bizanae*. a) Female anterior end. Note the regularly divided basal annulus in segments; b) lateral view of female anterior end showing the beginning of lateral fields at the 9th body annulus; c,d) female anterior end and face view; e) female posterior end. Note the areolated outer bands of the lateral fields at the scutellum area; f) ventro-lateral view at the vulval region; g,h) lateral and latero-ventral view of female posterior body portion; i) areolated lateral fields at the neck region; k) top: female lateral fields at mid-body; bottom: ventro-lateral view of the tail (anus arrowed); l,m) male anterior and posterior end. (Scale bars = 5 μm).

Fig. 1 (front page) - *Scutellonema bizanae* (Chinese population). A) Female anterior region; B) anterior end; C) female lateral view at vulva region; D,E) female face view and profile; F,G) female lateral view of excretory pore and vulva region; H,I,L) female tails; M,N,O) male posterior end.

apertures are present between the lateral edges of the oral disc and the lateral sectors of the first annulus. The lateral fields have four equidistant lines 6-7 μm or 1/4 as wide as the body width (Figs 1C, 2k top). Anteriorly the field begins at the 8-10th body annulus as three lines forming two regularly areolated bands (Fig. 2b). Irregular areolation of the lateral fields (outer bands) is present only on the anterior part (neck region) of the body and at the scutellum area (Figs 2i, 2g, 2h). Stylet with rounded knobs 5-5.5 μm across, the conical portion of the stylet about 42-48% of the total stylet length. DGO = 4.8-5.3 μm behind stylet knobs. Median oesophageal bulb slightly oval (9.5x14 μm) situated 80 (77-85) μm from the anterior end. The scutellum-like phasmids (5-6.2 μm) in diameter at the anal latitude (Fig. 2k). Excretory pore located 143 (126-154) μm from the anterior end, opposite or posterior to oesophageal valve. Oesophagus 142 (129-155) μm long; 112 (102-120) μm to oesophago-intestinal valve. Oesophageal gland nuclei three, distinct 4-5 μm in diameter. Tail with rounded hemispherical terminus often with a greater curvature dorsally about 0.6-0.8 times the anal body width long, bearing 12 (11-14) annuli to terminus. Anal opening (arrowed in Fig. 2k) present on the 11-14th annulus from the tail terminus near the posterior margin of the annulus and appearing in ventral view as a circular pore occupying half annulus width (Fig. 2k).

Male: (n = 5) L = 680 (654-704) μm; a = 28 (27-29); b = 6.0 (3.8- 6.5); b' = 5.0 (4.8-5.5); c = 37 (36-39); stylet length = 27 (26-29) μm; spicules = 28 (27-32) μm; gubernaculum = 14 μm; testis = 246 (240-255) μm, 37% (36-38) of the body length.

Body open to closed C-shaped with striae 1.7 μm apart at mid-body. Lip region hemispheroidal with 4 annuli. Distance from anterior end to the base of oesophageal bulb 131 (128-135) μm; 110 (108-112) μm to oesophago-intestinal valve. Excretory pore 115 (110-117) μm from anterior end. Tail conoid 17-18 μm long, 0.7-0.8 times the anal body width, bearing at the cloacal latitude phasmids of 3.8-4 μm in diameter and coarsely striated bursa (Figs 1 M, N, O; 2l, m).

Remarks

The Chinese population of *S. bizanae* is taxonomically similar to the original description given by Van den Berg *et* Heyns (1973). *S. bizanae* is similar to *S. clariceps* Phillips, 1971 in possessing males, lateral field at the scutellum areolated and striated basal lip annulus, but differs from *S. clariceps* by the greater number of striae on the basal head annulus (18-24 vs 14-15). *S. erectum* Sivacumar *et* Khan, 1981 and *S. siamense* Timm, 1965 also have males and aerolation at the level of the scutellum but both species have only six longitudinal striae on the basal lip annulus. *S. bizanae* can easily be differentiated from *S. labiatum* Siddiqi, 1972 and *S. tsitsikamense* Van den Berg, 1976 which also presents longitudinal striae on the basal lip annulus but no areolation at the level of the scutellum. SEM photomicrographs of our specimens (Figs 2a, 2d) clearly show the basal annulus divided into 24 regular segments while the basic arrangement of cephalic characters confirms the typical arrangement of the Hoplolaimid face view observed by Vovlas (1984) who also provided SEM illustrations of five species in the subfamily Hoplolaiminae.

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Accepted for publication on 11 May 1988.