Hemicriconemoides sinensis sp. n. (Nemata : Criconematidae) from China

Nicola VOVLAS

Istituto di Nematologia Agraria, C.N.R., Via Amendola 165/A, 70126 Bari, Italy.

SUMMARY

Hemicriconemoides sinensis sp. n. collected in the Henan province of China from the rhizosphere of grape *(Vitis vinifera)* is described. This species appears closely related to *H. mangiferae* Siddiqi and *H. gaddi* (Loos) Chitwood & Birchfield, but differing from both and from all the species of the genus by the stylet that is the longest (95-106 µm). The long body females have rounded heads and hemispherical tails. The first head annulus is smaller than the second one. Males are unknown. Juveniles have annuli with finger-like, triangular scales arranged in twelve rows.

RÉSUMÉ

Hemicriconemoides sinensis *sp. n. (Nemata : Criconematidae) provenant de Chine*

Hemicriconemoides sinensis sp. n. récolté dans la rhizosphère de vigne *(Vitis vinifera)* provenant de la Province du Henan (Chine) est décrit. Cette espèce paraît proche de *H. mangiferae* Siddiqi et de *H. gaddi* (Loos) Chitwood & Birchfield; elle en diffère, ainsi que de toutes les autres espèces, par le stylet qui est le plus long dans le genre (95-106 µm). Les femelles, dont le corps est long, ont une région céphalique arrondie et une queue hémisphérique; le premier anneau céphalique est plus étroit que le second. Le mâle n'a pas été observé. Les anneaux des juvéniles sont ornés d'écailles triangulaires, digitiformes, disposées en douze rangées longitudinales.

Several specimens of an undescribed *Hemicriconemoides* species were found during a plant parasitic nematode survey conducted in Zhengnhou, Henan province, China. The survey was carried out in 1984, in a cooperative program sponsored by both the Chinese Academy of Agricultural Sciences (CAAS) and the Italian National Council of Research (CNR). The new species is described and illustrated by light microscope, scanning electron microscope (SEM) and drawings.

The specimens utilized for this study were extracted from soil samples by Cobb's (1918) sieving and decanting method, than killed and fixed in a hot aqueous solution of 4 % formaldehyde + 1 % propionic acid. Some specimens were mounted in dehydrated glycerine (Hooper, 1985), others transfered to 1 % osmium tetroxide for 12 h, infiltrated with Spurr's low-viscosity resins (De Grisse, 1973; Clark & Stone, 1975), coated with gold and examined and photographed by scanning electron microscopy using 5 kV of accelerating voltage. Glycerine mounted specimens were also used for SEM observations.

Hemicriconemoides sinensis sp. n.
(Fig 1 & 2)

MEASUREMENTS

Female (paratypes; n = 25) : L = 500 ± 41.2 µm (440-600); a = 17 ± 1.2 (15-18); b = 3.8 ± 0.3 (3.1-4.1); c = 30 ± 2.9 (26-35); V = 93.5 ± 0.5 (93-94); stylet = 100.5 ± 2.1 µm (95-106); R = 125 ± 4.9 (115-132); Rst = 25 ± 1.5 (24-28); Rex = 39 ± 3.2 (36-47); RV (from terminus) = 9-10; Ran 5-6; VL/VB = 1.5 ± 0.1 (1.3-1.7).

Holotype (female) : L = 450 µm; a = 16.6; B = 3.2; c = 34; maximum body diameter = 28 µm; anal body diameter = 15 µm; V = 93; anterior end to excretory pore distance = 144 µm; anterior end to the end of oesophagus = 138 µm; stylet = 100 µm or 72 % of the oesophagus length; reproductive system = 180 µm or 40 % of L; vulva-terminus distance = 32 µm; R = 123; Rst = 27; Roes = 37; Rex = 39; Rv (from terminus) = 10; Ra = 5; VL/VB = 1.33.

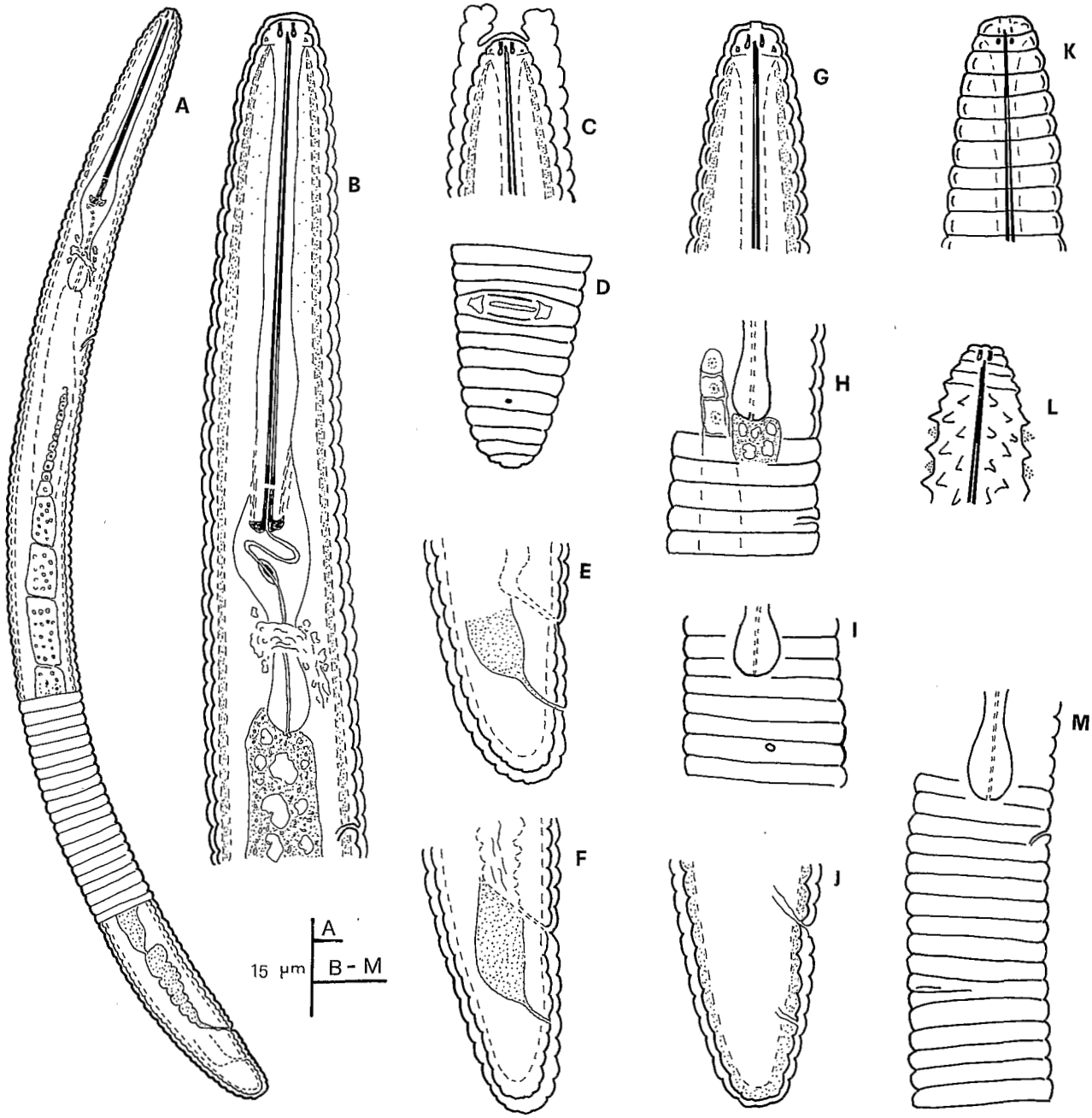

Fig. 1. *Hemicriconemoides sinensis* sp. n. A : Entire female; B : Female anterior region; C, G; K : Female anterior end; D, E, F, J : Female tails; H, I : Lateral and ventral view of female body at oesophago-intestinal valve latitude; L : Juvenile anterior end; M : Lateral view of anterior body portion showing a dorsal anastomosis.

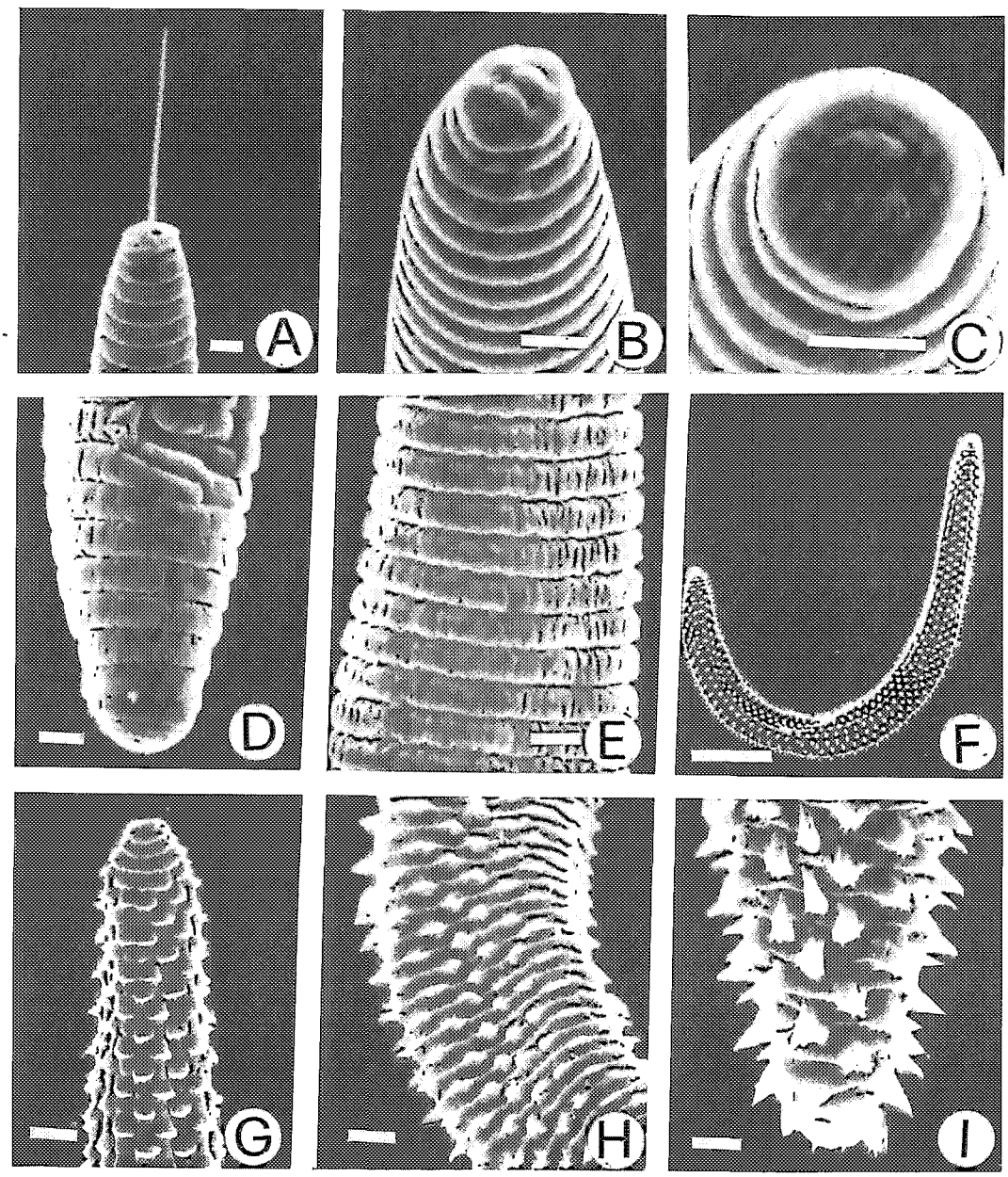

Fig. 2. *Hemicriconemoides sinentis* sp. n. SEM photomicrographs. A, B : Female anterior body portion; C : Female head view; D : Female tail in ventral view, a = anus; vulva arrowed; E : Female mid-body; F : Entire juvenile; G : Juvenile anterior region; H, I : Juvenile mid-body and tail. *Scale bar = 5 µm.*

DESCRIPTION

Female : Body cylindrical, rounded at both ends, slightly curved ventrally. Body annuli 4-4.5 µm wide at mid-body with very rare anastomosis. Labial region continuously rounded with body contour, consisting of two cephalic annuli, first annulus always smaller than the second one. The long stylet, with anchor-shaped stylet knobs 7-8 µm wide, is 19 % ± 1.7 (16-21), of body length and 71 % ± 4.1 (62-80), of oesophagus length. Oesophagus typical of the genus; median and terminal bulb 52 % and 27 % respectively of the corresponding body width. Excretory pore situated on 36-47th body annulus 158 ± 12.3 µm (143-170), from anterior end. Nerve ring encircling the oesophagus at the middle of the isthmus with ganglian cells mostly concentrated ventrally. Female reproductive system well developed 216 ± 52.6 µm (140-300), occupying usually about 50 % of the body length but rarely overlapping the oesophagus. Spermatheca not observed on any of the specimens. Vulva conspicuous a transverse slit 13 µm long, open between two small vulva cuticular sheaths. Vulva-terminus distance is 1.5 (1.3-1.7) times the body width, and 2.5 (4.8-6.3) times the stylet length. Tail rounded hemispherical, about 17 µm long with cuticular sheath separated from the body. Anus located at the level of 4th annulus posterior to the vulva and appears as a small pore about half an annulus or less in diameter.

Juveniles : Body curved ventrally. Annuli with triangular or finger-like scales, directed posteriorly, and arranged in twelve rows, bearing on their distal margin three or four dentations. Rows of scales in alternating position. Labial region with two annuli and the oral disc. Both annuli with smooth margins. First and second body annuli also without scales.

Male : unknown.

TYPE SPECIMENS

Holotype, female : slide V 11/3/1 at Istituto di Nematologia Agraria, CNR, Bari, Italy.

Paratypes : Slide V 11/3 2-10 (females and juveniles) at the Istituto di Nematologia Agraria, CNR, Bari, Italy and two females each at : Commonwealth Institute of Parasitology, St. Albans, Herts, England; USDA Nematode Collection, Beltsville, Maryland, USA; Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France; Zhengnhou Institute of Pomology, Zhengnhou, Henan, China; German Nematode Collection, Institut für Nematologie, Münster, W. Germany.

TYPE HABITAT AND LOCALITY

Sandy loam soil about roots of grape (*Vitis vinifera* L.), Zhengnhou, Henan Prov., China. *H. sinensis* n. sp. has been identified also from apple orchards in the same province.

DIAGNOSIS

Hemicriconemoides sinensis sp. n. is distinct from all other described species in the genus by the stylet that is the longest (mean = 100.5 µm), the continuously rounded head shape and the rounded hemispherical tail.

Hemicriconemoides sinensis sp. n. appears closest to *H. mangiferae* Siddiqi, 1961 (= *H. litchi* Edward & Misra, 1963; = *H. birchfieldi* Edward, Misra & Singh, 1965) from which it differs in spear measurements, absence of spermatheca and the rounded hemispherical tail *vs* conoid in *H. mangiferae. H. sinensis* sp. n. shows also resemblance to *H. gaddi* (Loos, 1949) Chitwood & Birchfield, 1957, but differs from this species in its longer stylet [100.6 (95-106) *vs* 79-85 µm (Ceylonese population) or 72-76 (Indian population)] and by its rounded hemispherical tail *vs* the conical and longer tail in *H. gaddi.*

ACKNOWLEDGEMENTS

I thank Dr. R. P. Esser, Division of Plant Industry, Gainesville, Florida, USA, for his help in the preparation of the manuscript. I also thank Dr. Zhixing Li, Deputy Chairman of Fruit Tree Research Institute, CAAS, Zhengrhou, People's Republic of China, for his cooperation and facilities in making possible the nematode survey in the Henan province of China.

REFERENCES

CLARK, S.A. & STONE, A. R. (1975). A simple method for preparing nematodes for scanning electron microscopy, using Spurr's low-viscosity epoxy resin. *Nematologica,* 21 : 256-257.

COBB, N. A. (1918). Estimating the nema population of soil. *USDA Agric. Techn. Circ.,* 1, 48 p.

DASGUPTA, D. R., RASKI, D. J. & VAN GUNDY, S. D. (1969). Revision of the genus *Hemicriconemoides* Chitwood & Birchfield, 1957 (Nematoda : Criconematidae). *J. Nematol.,* 1 : 126-145.

DE GRISSE, A. (1973). A method for preparing nematodes and other soft tissues for scanning electron microscopy. *Meded. Fak. Landbwet. Rijksuniv. Gent,* 38 : 1685-1703.

HOOPER, D. J. (1985). Handling, fixing, staining and mounting nematodes. In : Southey, J. F. (Ed.). *Laboratory Methods for Work with Plant and Soil Nematodes.* London, Ministry Agric. Fish. & Food : 59-80.

SIDDIQI, M. R. (1977). *Hemicriconemoides mangiferae* Siddiqi, 1961. *CIH Descript. Pl.-paras. Nematodes,* Set 7, nº 99, 4 p.

Accepté pour publication le 5 avril 1987.