* *Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100094, P. R. China*
** *Istituto di Nematologia Agraria, C.N.R., Via Amendola 165/A 70126 Bari, Italia*

OCCURENCE OF THE CYST-FORMING NEMATODE *CACTODERA THORNEI* IN CHINA

by
D.L. PENG* and N. VOVLAS**

Summary. The morphlogy of a population of *Cactodera thornei* (Golden *et* Raski, 1977) Krall *et* Krall, 1978 found in cereal fields in China is illustrated by light microscope micrographs and drawings. This is the first report of this cyst nematode not known previously to occur in Asia. The morphology and morphometrics of juveniles and cysts of the chinese population correspond with previously published literature. However the range of the cyst length is relativerly shorter than in the American population (364-633 µm vs 485-806 µm). There is also a small variation in juvenile stylet length (23.5-26.1 µm vs 25-28 µm) and DGO (2.6-3.9 µm vs 5-7 µm).

Very little is known about the occurence and distribution of cyst forming nematodes in cultivated areas of China. Only *Heterodera glycines* Ichinohe, 1952 and *H. avenae* Wollenweber, 1923 parasitizing soybean and wheat, respectively, are reported (Chen, *et al.*, 1987; 1992). This paper reports on the morphology of *Cactodera thornei* (Golden *et* Raski, 1977) Krall *et* Krall, 1978 isolated by one of us (D. L. Peng) during the summer 1992 nematode collection for cyst forming nematode species of cereals and grasses in Yiaoshuitan town, Xining city of the Qinhai province of China. The host of the nematode could not be identified because the soil samples were taken when the fields were cultivated and prepared for planting wheat.

Materials and methods

Cysts were recovered from soil samples by Fenwick can, while second-stage juveniles were hatched in water at room temperature, killed and fixed in hot 4% formaldehyde + 1% propionic acid and transferred to dehydrated glycerine in permanent slides. Terminal cone regions of cysts were permanently mounted in lactophenol for measurements and photography.

Description

Cactodera thornei (Golden *et* Raski, 1977) Krall *et* Krall, 1978 (Chinese population)

Embryonated eggs: (n=40), length 125.1±3.6 (117.1-131.7) µm; width = 41.6±1.5 (39.7-44.4) µm; L/W = 3.0±0.14 (2.8-3.2).

Exterior shell with small distinct punctations visible under light microscope observations (Fig. 2 D, E).

Second-stage juveniles: (n=20), body length 457.3±20.0 (424.0-496.0) µm; body width 19.0±0.5 (18.3-19.6) µm; a = 23.9±1.1 (22.3-25.8); b = 3.2±0.35 (2.5-3.7); c = 8.9±0.55 (8.3-10.1); head end to stylet base 26.4±0.68 (25.5-27.5) µm; stylet length 25.1±0.74 (23.5-26.1) µm; dorsal oesophageal gland orifice 3.3±0.42 (2.6-3.9) µm from base of stylet; tail length 51.5±2.2 (47.7-55.6) µm; hyaline terminus length 26.8±2.7 (22.8-29.4) µm.

Body vermiform, tapering at extremities, especially posterior, head with cephalic sclerotization and slightly offset (Fig. 1 A, B, Fig. 2 B), head height 3.7 µm, width 8.7 µm with 4 annules. Stylet well developed, averaging 25.1 µm in length, cone and shaft almost equal in length (Fig. 1 B). Median bulb centre 71±5.2 (62.1-80.4) µm from anterior end. Excretory pore 107±6 (93-118) µm from anterior end. Hemizonid distinct, two annuls long, located immediately anterior to excretory pore. Oesophageal length 143.1±19.1 (117.6-143) µm, occupying approximately 40% of body length, oesophageal glands overlapping intestine ventrally and laterally. Genital primordium usually with two-celled stage (Fig. 1A), situated at 60-70% of body length from anterior end. Tail tapering, terminus round, phasmid indistinct (Fig. 1 C, D; Fig. 2 C).

Cysts (n=20): body length 548.2±78.8 (363.6-633.3) µm; body width 432.9±83.39 (287.9-568.0) µm; neck length 63.2±19.3 (22.7-100, n=14) µm, L/W = 1.28±0.17 (0.97-1.59); fenestrate diameter (dorsal-ventral length) 31.6±5 (25.4-41.3, n=17) µm; fenestrate diameter (lateral) width 28.5±5 (22.2-41.3, n=17) µm; anus-fenestral edge distance 28.2±12.7 (13-66.7, n=17) µm.

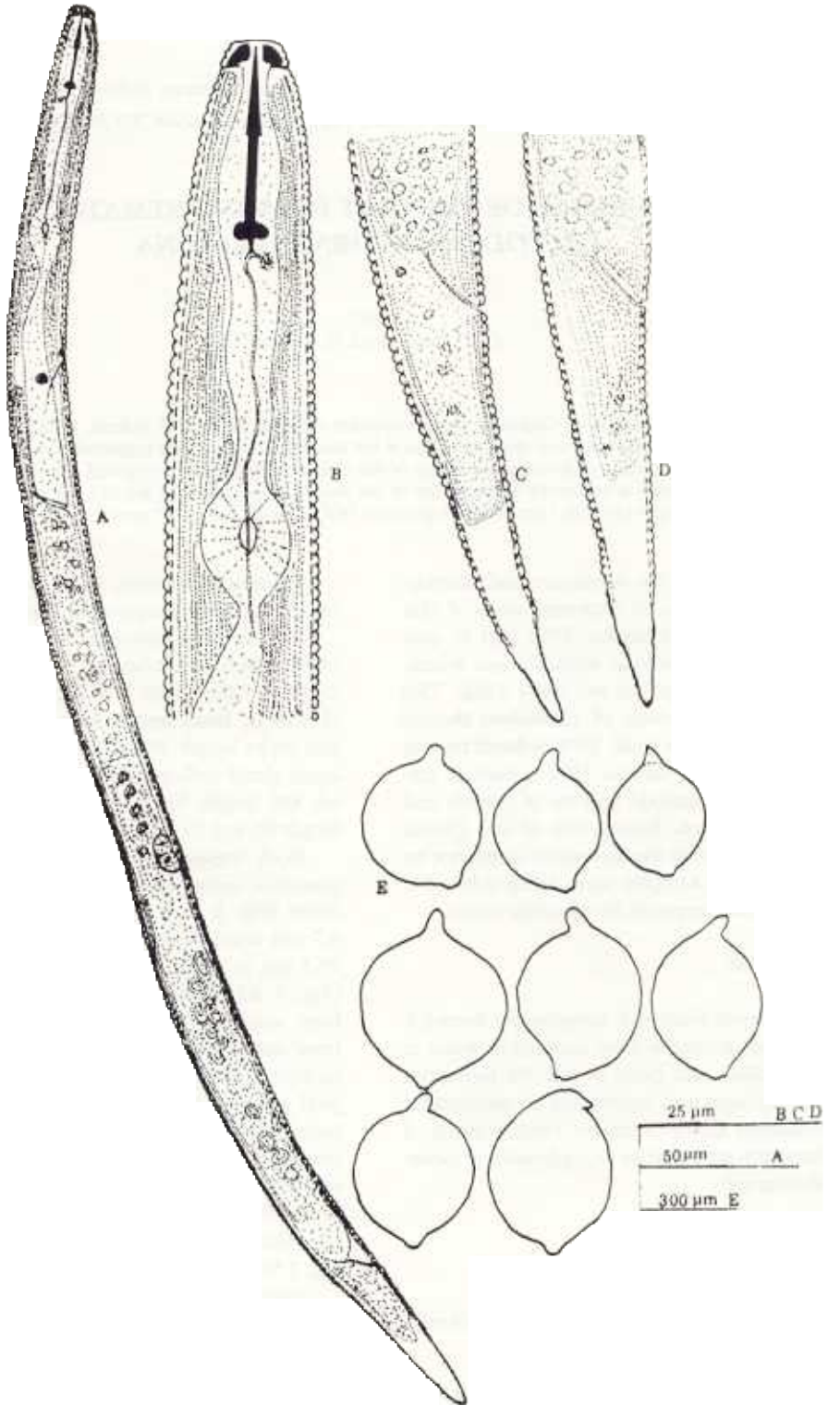

Fig. 1 - Second-stage juveniles (J_2) and cysts of *Cactodera thornei*: A, entire J_2 specimen; B-D, anterior and posterior regions of J_2; E, the shape of cysts.

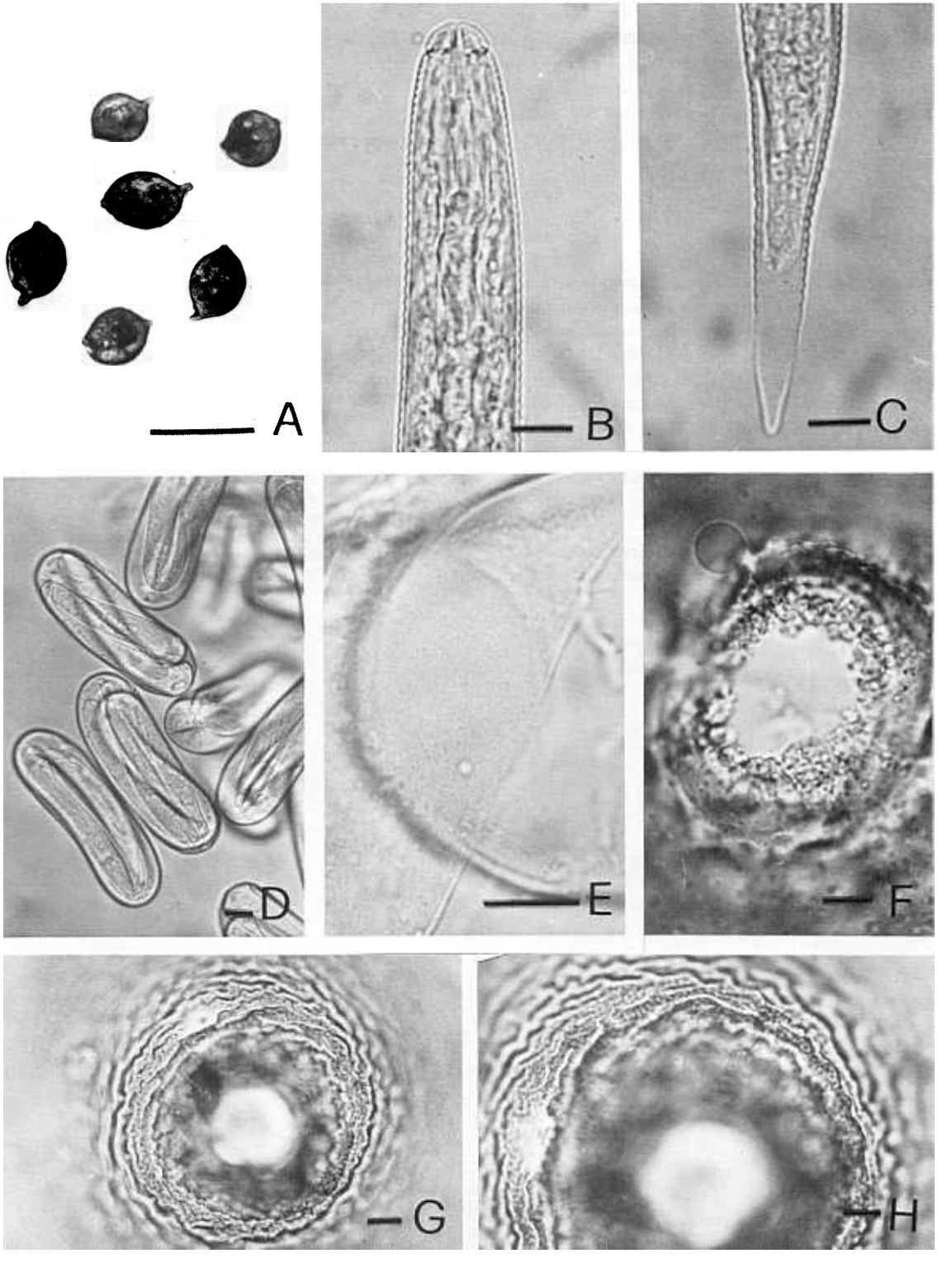

Fig. 2 - Photomicrographs of *C. thornei*: A, whole cysts; B and C, anterior body portion and tail of J_2 juvenile; D, eggs; E, portion of egg showing fine punctation on egg shell; F-H, fenestra of cysts. Scale bars 300 µm for A and 10 µm for the others.

Cysts light to dark brown in colour; lemon to subspherical shaped, with protruding neck and cone (Fig. 1 E, Fig. 2 A), abullate, circumfenestrate (Fig. 2 F-H), vulval denticles conspicuous below fenestral surface. External cyst wall pattern at midbody consists of basically parallel ridges, anus to edge of fenestrate distance variabe, averaging 28.2 µm.

Relationships

In general, the morphology and morphometrics of juveniles and cysts of the Chinese population of *Cactodera thornei* correspond with previously published literature (Golden and Raski 1977; Mulvey and Golden, 1983; Baldwin and Bell, 1985; Graney and Bird, 1990). However the range of the cyst length is relatively shorter than in the North American population (363.6-633.3 µm vs 485-806 µm). A small variability exists also between the juveniles in stylet length (23.5-26.1 µm vs 25-28) and DGO (2.6-3.9 µm vs 5-7 µm).

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