

New data on *Gracilacus colina* Huang & Raski, 1986 (Nemata : Criconematoidea)

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Summary – The species *Gracilacus colina* Huang & Raski, 1986 was found for the second time. The males, unknown up to the present, are described. The population studied show slight differences with the original description. These differences can be considered as being within the limits of variability of the species.

Résumé – *Nouvelles données sur Gracilacus colina Huang & Raski 1986 (Nemata : Criconematoidea)* – C'est la deuxième fois que l'espèce *Gracilacus colina* Huang & Raski, 1986 est observée. Le mâle, inconnu jusqu'ici, est décrit. La population étudiée montre de légères différences avec la description originale, différences considérées comme relevant de la variabilité de l'espèce.

Key-words : Nematodes, *Gracilacus*, Argentina.

During a survey of plant-parasitic nematodes in the western region of Córdoba province, Argentina, a large population of the genus *Gracilacus* Raski, 1962 (Paratylenchinae) was found. This population belonging to the species *G. colina* Huang & Raski, 1986 is described and illustrated below.

Virgin soil samples around the roots of *Cassia* sp. from Pampa de Achala, San Alberto Department, Province of Córdoba, Argentina, were analyzed. The soil is clayed silt, acid (pH = 4.9) with an average content of total nitrogen (N % = 1.70) and poor in interchangeable elements. Nematodes were extracted by use of centrifugal – flotation method (Jenkins, 1964). Specimens were killed and fixed in hot fixative (Netscher & Seinhorst, 1969) and processed to glycerin (Seinhorst, 1959). Given the marked variability in body swelling, neither the character “body diameter” nor the ratio “a” were evaluated. For SEM observations, fixed specimens were dehydrated in a graded series of alcoholic solutions, critical point dried from CO₂ and coated with a 200 Å layer of gold. The specimens were examined with a Jeol SM-U3 microscope, working at an accelerating voltage of 15 kV.

Gracilacus colina Huang & Raski, 1986

(Figs 1, 2)

MEASUREMENTS

See Table 1

DESCRIPTION

Female : Adult specimens with slender to obese body, great variation in body swelling; anterior end rounded, posterior end conical; when killed by gentle heating habi-

tus slightly sinuate to deeply curved ventrally. In slender specimens, the body has a tube-like structure in all its length; in specimens moderately swollen and obese, from the vulvar region the body constricts abruptly hook-shaped. Cuticle with distinct annules about 1 µm wide in the oesophageal region and 2 µm wide at mid-body; between the anterior end and the 20th to the 30th annules cuticle shows spherical warts arranged in a single row with regular intervals around body, except in the region of the lateral fields where the row of warts is interrupted. SEM observations show that cuticular warts have a spherical to rectangular shape and are sited on ridge of annulus. Lateral field – difficult to see with optical microscope – delimited by three lines occupying about 20 % of body width. These lines start approximately at the level of the 15th body annule and finish close to the caudal end. Labial area slightly rounded, not separated from the rest of the body, free of cuticular warts, with four submedian lobes closely spaced. Oesophagus typical of the subfamily, median oesophageal bulb occupies over half of body width, with large crescentic valvular apparatus. Stylet long, sometimes slightly curved, conus considerably long in relation to the total length of stylet (85 % – 97 %, \bar{X} = 92 %, SD = 2.26, CV = 2.46), basal knobs slightly rounded with flattened anterior surface. Excretory pore, nerve ring, intestine, rectum and anus not seen. Genital branch well developed, its length varies between specimens. In filiform specimens (which supposedly have just reached the adult stage), the ovary is observed with oocytes in one row and a region somewhat close to vulva filled with sperms (in some cases the differentiation of spermatheca is evident). In obese specimens, the reproductive branch is so strongly devel-

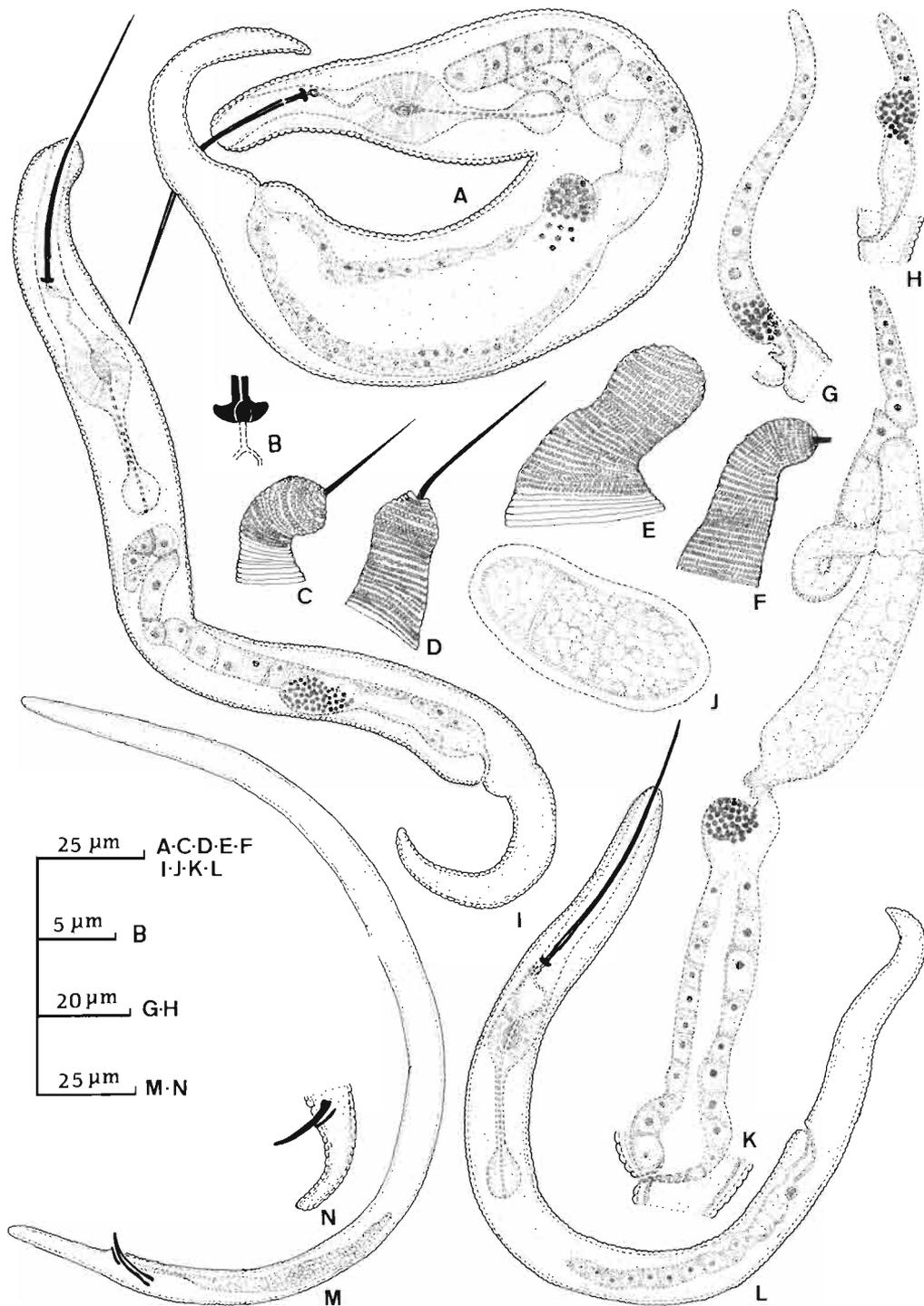


Fig. 1. *Gracilacus colina* Huang & Raski, 1986 from Córdoba, Argentina. – Female. A, I, L: Obese, moderately swollen and slender animal in toto, respectively; B: Basal portion of stylet; C, D, E, F: Anterior region (lateral view); G, H: Genital branch in thin specimens; J: Egg; K: Genital branch in obese specimens. – Male. M: Animal in toto; N: Posterior region (lateral view).

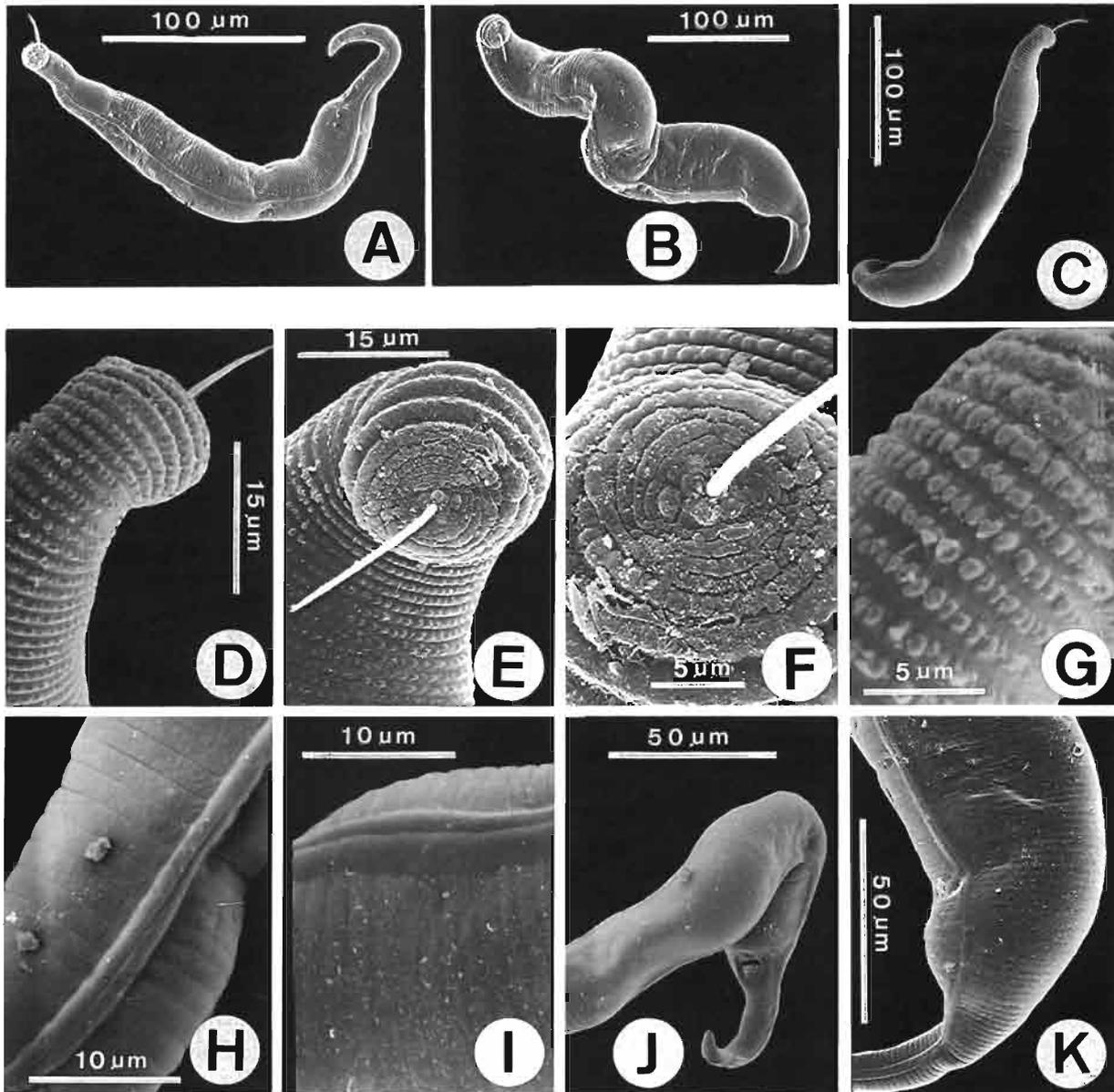


Fig. 2. *Gracilacus colina*. Huang & Raski, 1986 from Córdoba, Argentina. (SEM pictures). – Female. A, B, C : Moderately swollen specimens, in toto; D : Anterior region (lateral view); E, F : Anterior region (en face view); G : Cuticle, anterior region (warts); H, I : Cuticle (lateral field); J : Posterior region (ventral view); K : Posterior region (lateral view).

Table 1. Measurements of adults of *Gracilacus colina* Huang & Raski, 1986 from Córdoba, Argentina.

Characters	Females (n=75)	Males (n=8)
Body length (mm)	0.29 ± 0.01 (0.25-0.34) 6.01	0.29 ± 0.02 (0.28-0.34) 7.59
Body diameter	-	10 ± 0.95 (9-12) 9.51
a	-	30.16 ± 2.05 (28.01-33.22) 6.79
Distance between anterior end and valve of median bulb	73 ± 11.46 (46-111) 15.70	-
MB	62.01 ± 3.77 (50.70-74.15) 6.08	-
Oesophagus length	99 ± 13.62 (71-131) 13.76	-
b	3.04 ± 0.41 (2.23-4.31) 13.61	-
Stylet	68 ± 4.87 (56-75) 7.16	-
Conus	63 ± 4.05 (51 - 70) 6.43	-
V	75 ± 2.01 (69-78) 2.69	-
Tail length	-	22 ± 4.26 (16-28) 19.36
c	-	13.94 ± 2.24 (10.21-17.68) 16.06
Body diameter at anus	-	8 ± 1.03 (7 - 10) 12.87
C'	-	2.84 ± 0.55 (2.28 - 4.01) 19.36
Spicules	-	20 ± 3.02 (16-26) 15.10
Gubernaculum	-	5 ± 0.83 (4-6) 16.69

oped that the ovary may reach the base of the oesophagus and fold backwards. Oviduct more or less tortuous, spermatheca rounded, laterally displaced containing refringent sperms with circular contour. Uterus with thick walls; vagina short, slightly curved. Vulva transversely located on the posterior portion of the body, in a slight depression.

Male : Slender specimens. When killed by gentle heating, habitus C - shaped, more or less closed. Anterior and posterior end rounded. Stylet lacking, oesophagus degenerate. Lateral fields and excretory pore not seen. Gonad short. Spicules well developed, slightly curved ventrally. Gubernaculum short, also curved. Tail cylindrical or conical, straight or slightly curved.

Juveniles : not found.

VOUCHER SPECIMENS

They are deposited in the nematode collection of the following institutions : Laboratorio de Nematología, Centro de Zoología Aplicada, Universidad Nacional de Córdoba, Argentina; Muséum National d'Histoire Naturelle, Paris, France; USDA Nematode Collection, Maryland, USA; Laboratorium voor Dierkunde, Faculteit Wetenschappen, Gent, Belgium; Laboratorium voor Nematologie, Landbouwhogeschool, Wageningen, Nederland; University of Brasilia, Brazil.

REMARKS

The population found is composed of obese females 17 %, moderately swollen females 62 % and slender females 21 %; the scarcity of obese females in relation to the rest agrees with situations formerly observed (Esser, 1992). This situation seems to be related to genital branch development. The genital branch anterior portion is thin; no eggs have been observed in slender specimens. Moderately swollen specimens show a higher development of this portion (wide and huge ovocytes), and only in a few cases an egg in the uterus. In the obese specimens the genital branch exhibits its higher development, the uterus is notably large and generally contains one egg in clivage stage.

This population shows affinities to two other species of the genus in that the females are characterized by having cuticles bearing distinct warts : *G. mutabilis* (Colbran, 1969) Raski, 1976 and *G. punctata* Huang & Raski, 1986. However, in view of the fact that the warts only occur in the oesophageal region and of the general morphometric characters, the population under study can be considered to belong to the species *G. colina* Huang & Raski, 1986.

All measurements are in μm , except body length
The disposition of the measurements corresponds to the following arrangement :
arithmetic mean ± standard deviation
(range)
coefficient of variation

The Argentine population differs from the original description of the species (Huang & Raski, 1986) with respect to the cuticular warts and the lines of the lateral fields (two rows of warts are interrupted at level of the region where the lines start and cuticle remains flat *vs* the longitudinal lines are substituted by clusters of irregular cuticular warts).

G. colina was described based on a single specimen; thus, no data on the variability of its morphological and morphometric characteristics were provided. The study of the Argentine population did not show the existence of variability for the morphological characters. With regard to the morphometric characters, the corresponding CV may be considered somewhat low (mainly that of ratio V which is lower than 3%). Thus, specimens found in virgin soils of Brazil and Argentina up to the present can be regarded as representatives of a well defined species.

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