

Istituto di Nematologia Agraria, C.N.R. - Bari, Italy

## SPECIES OF POTATO CYST NEMATODES FROM CHILE

by

INGRID MORENO<sup>1</sup>, N. VOVLAS and F. LAMBERTI

The potato cyst nematode, *Globodera rostochiensis* (Woll.) Mulvey *et* Stone, was first reported in Chile from the La Ligua region in 1973 (Ministry of Agriculture, Servicio Agrícola y Ganadero), but its occurrence has been noted in the last ten years in several other potato growing areas of the northern part of the country by officers of the Division of Plant Protection of the Servicio Agrícola y Ganadero.

The object of this note is to illustrate some diagnostic characteristics of *G. rostochiensis* and *G. pallida* Stone, the latter species reported for the first time from Chile, based on some taxonomic characters of the juveniles and the morphology of the cyst vulval cone of Chilean populations. Informations are also produced on the geographical distribution of the potato cyst nematodes in Chile to give instruction to the Ministry of Agriculture to protect from infestation the seed potato areas.

Over 20,000 soil samples were collected from potato growing areas of the country. The cysts were extracted by means of a Fenwick can. Cones from the cysts were mounted in Canada balsam. The distance

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<sup>1</sup> Servicio Agrícola y Ganadero, Division Proteccion Agricola, Ministerio de Agricultura de Chile and fellowships of the Food and Agricultural Organization of the United Nations in 1984.

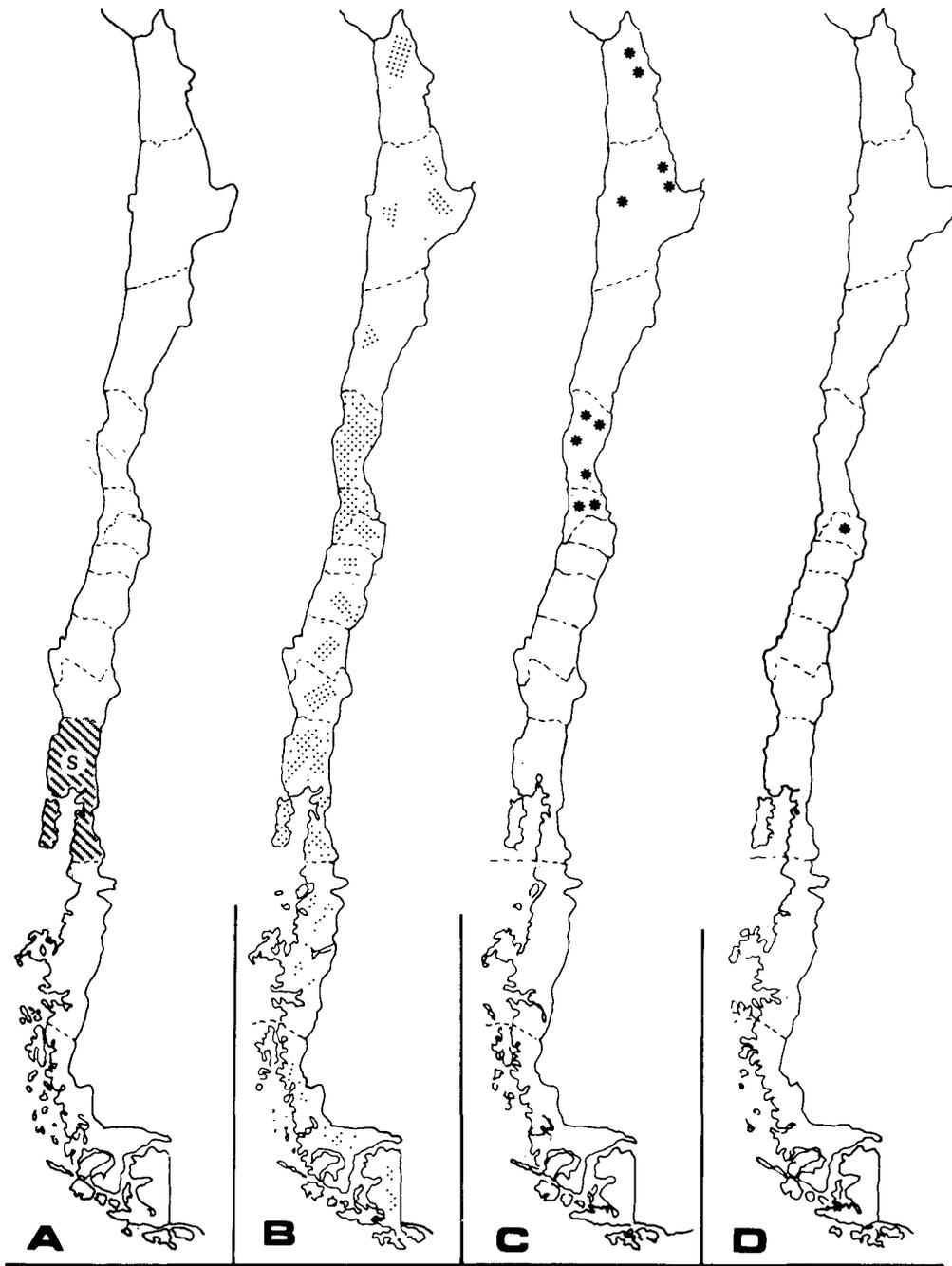


Fig. 1 - Map of Chile showing (A) the seed potato areas (S), (B) ware potato area (dotted) and occurrence of (C) *Globodera rostochiensis* and (D) *G. pallida* (asterisks).

from anus to the nearest edge of fenestra and other fenestral measurements were taken on specimens of representative populations for each region. Scanning electron microscope (SEM) observations of the cone were made on newly formed cysts. The perineal portions were placed in 1% osmium tetroxide for six hours and then transferred to lactophenol, mounted on SEM stubs, coated with gold and observed by SEM at 5 Kv accelerating voltage. Second stage juveniles were heat killed and measured in water mounts.

Studies based on morphometrical data revealed the occurrence in Chile of both *G. rostochiensis* and *G. pallida* (Fig. 1). The survey showed that *G. rostochiensis* is widely distributed in the northern provinces, while *G. pallida* has presently been identified only in La Ligua. However, there is some indication that the latter species also may be present in northern Chile and further soil samples are required to confirm this.

The two species, which are frequently found together differ only in the following aspects:

— juveniles of *G. pallida* are usually longer 473 (465-490)  $\mu\text{m}$  versus 455 (420-485)  $\mu\text{m}$  of *G. rostochiensis*, and their stylet too is longer  $23 \pm 0,7 \mu\text{m}$  vs  $21 \pm 0,5 \mu\text{m}$  respectively;

— the profile of the stylet knobs of juveniles of *G. pallida* is anteriorly pointed (fig. 3 C) compared to the rounded surface of *G. rostochiensis* (fig. 3 E);

— the cream or white females of *G. pallida* (fig. 2 A) also distinguishes them from *G. rostochiensis* which are characteristically golden yellow (fig. 2 B);

— finally there are more perineal cuticular ridges in the anal vulval region of the newly formed cyst of *G. rostochiensis* compared with *G. pallida*. Because the number of perineal ridges is related to the distance « B » from anus to the edge of the fenestra (fig. 3 A, B), *G. pallida* has a smaller « B » 38-52  $\mu\text{m}$  with respect to the *G. rostochiensis* 58-89  $\mu\text{m}$ .

Morphometrical characters for *G. rostochiensis* and *G. pallida* given by Stone 1973 a, 1973 b agree well with those of the Chilean populations, although Chilean specimens in both species tend to have shorter stylet lengths.

Much additional field and laboratory work remains to be done to extend the information on geographical distribution, host range of the nematodes and the tolerance limit of the potato.



A



B

Fig. 2 - Female of *G. pallida* protruding from tomato root 50 days after inoculation with eggs and juveniles from a single cyst (A) and females and cysts of *G. rostochiensis* protruding from potato roots; note the golden phase of female (arrowed) (B).

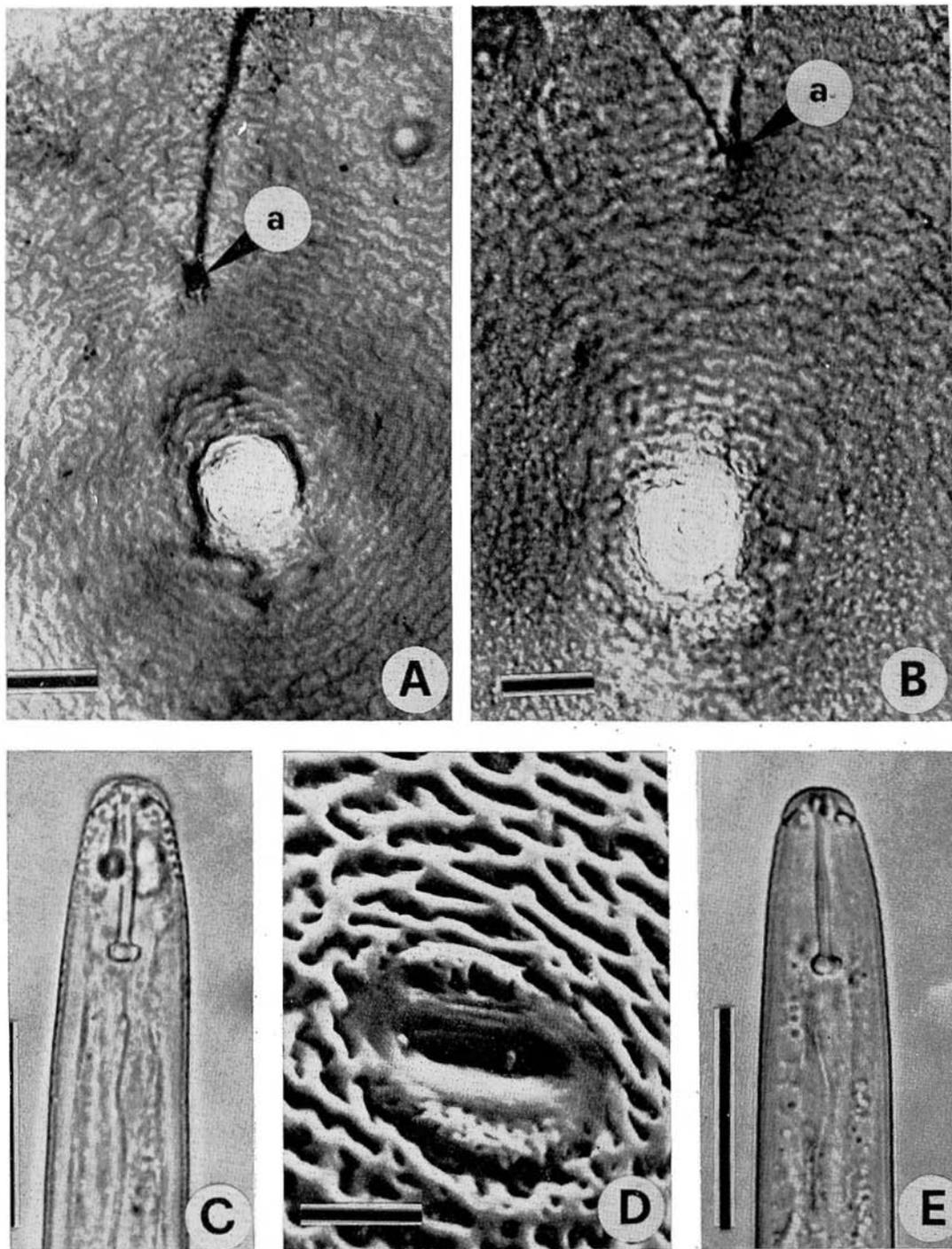


Fig. 3 - Anal-vulval region of cyst of *G. pallida* (A) and *G. rostochiensis* (B) (a=anus); head region of second stage juveniles of *G. pallida* (C); fenestralia of *G. rostochiensis* (SEM photomicrograph) (D); head region of second stage juveniles of *G. rostochiensis* (E) (Scale bar = 25  $\mu$ m).

## LITERATURE CITED

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- STONE A., 1973 b - *Heterodera pallida* Stone 1973. C.I.H. Descriptions of Plant-parasitic Nematodes. Set. 2, N. 17, St. Albans, England, 2 pp.

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