

Short note

***Heterodera iri* Mathews, 1971 a junior synonym of *H. ustinovii* Kirjanova, 1969**

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A "grass cyst nematode" that differed from the "oat cyst nematode" was reported from wild grasses in mountain regions of the Carpathians by Ustinov and Zinovjev (1961). Kirjanova (1969) described this species as *Heterodera ustinovii* from the roots of *Agrostis capillaris* L. (= *A. tenuis* Sibth., = *A. vulgaris* With.) from the Beskids, eastern part of the East Carpathian Mountains, the Ukraine. The precise type locality was not mentioned. Zinovjev and Volodchenko (1984) reported *H. ustinovii*, which had been transferred to *Bidera* by Krall and Krall (1978), present in virgin soils in many districts of the Ukraine.

The species description by Kirjanova (1969) was based on 10 females having a short, blunt vulval cone with a 10-14 µm long vulval slit, numerous bullae and a light and poorly developed underbridge. Characters of fully developed cysts were not given, data on males and juveniles were not presented, but measurements were given of eggs (136-147 x 42-50 µm; length:width = 3:1). Mulvey (1972) used material resembling *H. ustinovii* originating from the type host in Estonia for his studies on cyst characters (Krall, 1977). The population in question, originating from Valgemetsa, Tartu district, and recently mentioned again by Krall *et al.* (1999), had been considered by Kirjanova (pers. comm.) as identical with "her" *H. ustinovii*.

Because of the inadequate description of *H. ustinovii* opinion about the taxonomic status of the species has remained controversial. Some authors considered *H. ustinovii* as *species inquirenda* (Hesling, 1978; Stone, 1986), Wouts (1985) synonymized it with *H. avenae*, Mulvey (1972) considered it as probably representing a physiological race of *H. avenae*, and other authors continue to

retain it as a valid and distinct species (Krall, 1990; Evans & Rowe, 1998).

Our re-examination of *H. ustinovii* paratypes revealed some eggs, a few containing well developed juveniles. The juvenile stylet measured 24-26 µm, the stylet conus 11-13 µm and the stylet base having a diameter of 5.5 to 6 µm (n = 4). Tail length and tail shape could not be determined. Eight eggs measured 125-141 (132) x 44 x 53 (48) µm, with a length/width ratio of 2.75.

The second species in the *H. avenae* group parasitizing bent grass (*Agrostis*) is *H. iri* Mathews, 1971, which was described from Northern Ireland and occurs also in Scotland, Germany, Belgium, Ukraine and several other countries. The main morphological characteristics differentiating this species from other recognized members of the *H. avenae* group are the presence of an underbridge in the vulval cone and the long tail of the second-stage juveniles (Wouts & Sturhan, 1995; Wouts *et al.*, 1995; Subbotin *et al.*, 1999; Gäbler *et al.*, 2000). Re-examination of cysts and second-stage juveniles from Estonia used by Mulvey (1972) and tentatively identified as *H. ustinovii* showed close agreement with morphological characters of *H. iri*. We occasionally observed a weak and light underbridge, that Mulvey (1972) had not reported.

In September 1999 the senior author collected eight soil samples from grassland with *Agrostis* spp. in the mountainous most eastern region of Slovakia close to the border to the Ukraine. In two of the samples, originating from east and south of the village Zbor, populations of the *H. avenae* group were recovered. The cyst characters closely agreed with the descriptions given for *H. iri* by Mathews (1971) and Mulvey (1972). Fresh unfixed second-

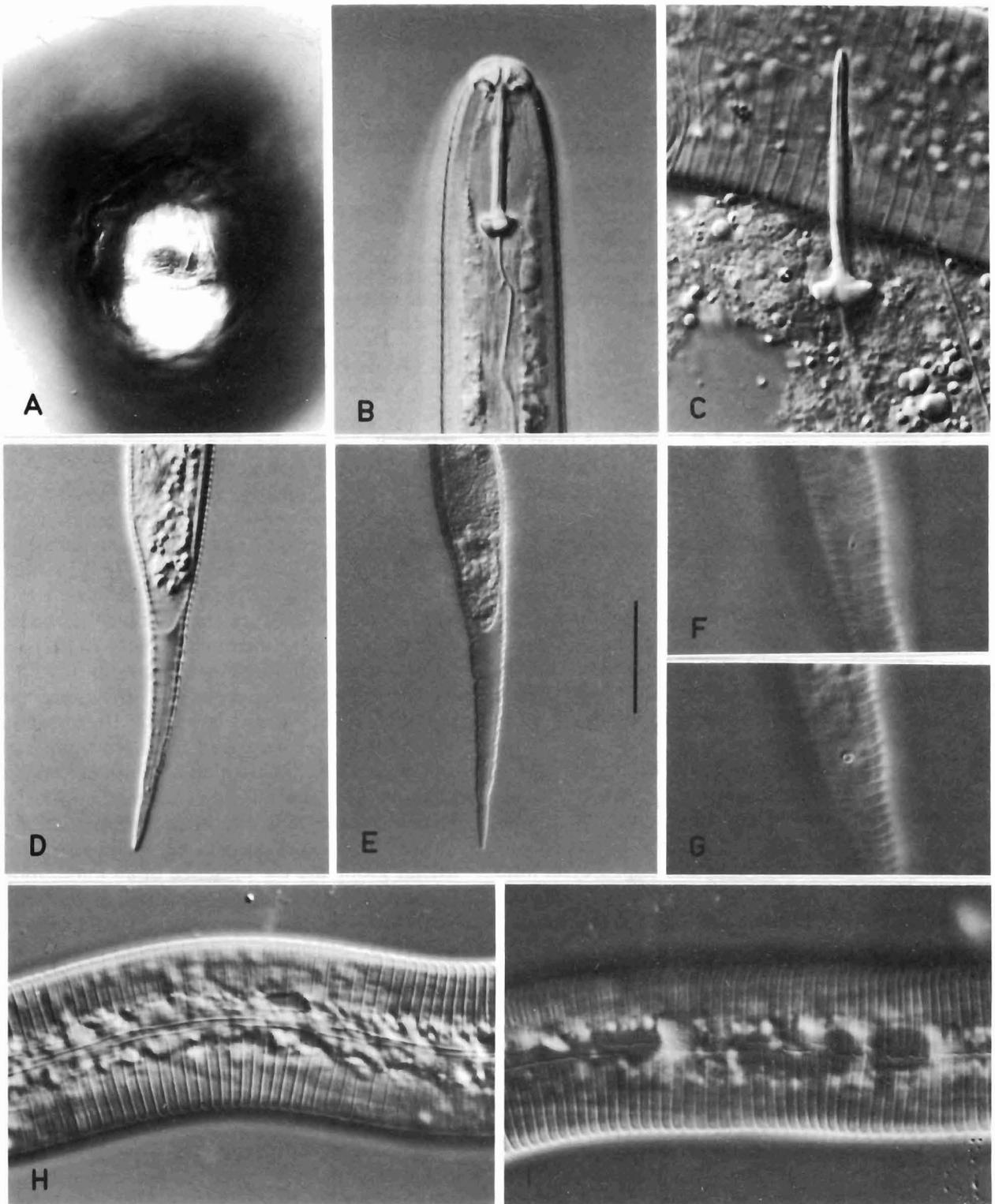


Fig. 1. A–D, F–I: *Heterodera ustinovi* (from Slovakia), E: *Heterodera iri* (paratype). A: Fenestration in vulval cone; B: Anterior end of J2; C: Excised stylet of J2; D, E: Tails of J2; F: Phasmid of J2, opening; G: Same as F, at deeper level; H, I: Lateral field in mid-body region of J2 (scale bar: A - 25 μ m; B - 15 μ m; C - 10 μ m; D, E - 25 μ m; F, G, H, I - 20 μ m).

stage juveniles had the following measurements (n=3): L = 570-610 µm, tail = 83-85 µm, hyaline tail part = 52-55 µm, stylet = 26-27 µm, stylet conus = 11.5-12 µm, stylet base 6 µm wide. From specimens fixed with TAF and transferred to glycerin mounts the following morphometrics were obtained (n=15): L = 560 (530-590) µm, tail = 80 (74-88) µm, hyaline tail part = 53 (46-61) µm, stylet = 25 (24-26) µm, conus = 11.4 (11.2-11.8) µm, stylet base diameter = 5.7 (5.4-6.0) µm. The phasmids are large, lens-like and located 2-3 annules behind anus level. Unfixed embryonated eggs measured 128 (117-135) x 47 (44-50) µm (n = 40). Molecular sequence studies of both Zbor populations revealed species identity with *H. iri* populations from UK, Belgium and Germany (Subbotin, pers. comm.).

Consequently, because of identical type host, our recent findings of *H. iri* populations in close proximity to the "type country" and the fact that all known morphological characteristics of *H. ustinovii* are in agreement with those of *H. iri*, we consider both species as conspecific and synonymize *Heterodera iri* Mathews, 1971 with *H. ustinovii* Kirjanova, 1969.

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