

Redescription of *Longidorus poessneckensis* Altherr, 1974 (Nematoda: Dorylaimida)

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Summary. *Longidorus poessneckensis* Altherr, 1974, originally described from specimens from Thuringia, Germany, was recently discovered at several sites in the central part of Germany, and at one site in Slovakia. On the basis of this material the species is redescribed, including all four juvenile stages. Males were not found. *Longidorus poessneckensis* is most similar to *L. macrosoma*, from which it differs by the shape of the lip region, cuticle structure on the tail end, shape of the J1 tail and absence of males. The species appears to prefer wet soil in forests and river flood-plains.

Key words: description, Germany, *Longidorus poessneckensis*, morphology, Slovakia, woodland.

Among nematodes recovered from a spring in the Pössneck District, Thuringia, Germany, Altherr (1974) found four females and three juveniles of a *Longidorus* species morphologically similar to *L. macrosoma* Hooper, 1961. He considered them to represent an undescribed species that he named *L. poessneckensis*. He gave a brief and not very detailed description. Rau (1975, 1976) isolated a *Longidorus* species, also resembling *L. macrosoma*, from wet forest soil (Fraxino-Ulmetum) at Himmelsthür, close to Hildesheim, Germany. He briefly characterized this population and outlined the differences from *L. macrosoma*, which included differences in chromosome number ($n=14$ in the Himmelsthür population, $n=7$ in *L. macrosoma*). In September 1981 we recovered the same species from soil samples taken at this locality, where it occurred together with *L. intermedius* Kozłowska & Seinhorst, 1979. Through comparison with the type specimens of *L. poessneckensis* we identified the Himmelsthür population as *L. poessneckensis*. In subsequent years we found this species, which appears to have a preference for moist woodland (Sturhan, 1995), in several other localities in Germany and one site in Slovakia. Our attempts in summer 1998 and October 2000 to collect the species at the type locality Langendembach near Pössneck failed. Recently, *L. poessneckensis* has

been recorded from several additional localities in the Slovak Republic (Lišková & Sturhan, 2000).

Mainly on the basis of our sampling material, which was mostly fixed in TAF and transferred to glycerin by the slow evaporation method and mounted on permanent microscope slides, a redescription of *L. poessneckensis* is given and some information is added of the type specimens, which were kindly made available to us by Dr. R. Vallo-ton, Nyon, Switzerland.

DESCRIPTION (Figs. 1 & 2)

Dimensions. Measurements and ratios of the four juvenile stages and adult females originating from different sites in Germany, plus the data published by Altherr (1974) and Rau (1975), and dimensions of a female found by us in the Slovak Republic, are given in Table 1.

Female. Habitus of heat-relaxed specimens C-shaped to almost circular, more curved in posterior region. Body slender: width at mid-body 79 (60-99) μm , reducing to 23%, 44%, 87% and 81% of mid-body width at base of lip region, guide ring, base of neck, and at anus. Cuticle with fine transverse subsurface striation along the whole body,

and punctation on posterior end; thickness about 5 μm in mid-body, increasing to about 6 μm in anterior part of neck and to 14-21 μm on tail terminus. Outer cuticular layers much thinner at mid-body than inner striated layer which increases to 70-80% of cuticle thickness posteriorly; on the tail narrow median layers encircle the terminus, where they often are more or less interrupted. Along the body 65-96 lateral pores, of which 7-9 are located in the neck region (2-3 between guiding ring and odontostyle base) and 2 (exceptionally 3) on the tail. In the neck region anterior to the basal bulb 6-8 ventral pores (2-3 within range of odontostyle or slightly more anterior) and 2-4 dorsal pores between guiding ring and odontostyle base, exceptionally the posterior one lies slightly behind this. Lateral chord occupying in mid-body around 30% of body diameter.

Lip region continuous, rounded, flattened anteriorly, 19 (17-22) μm wide at base. Amphidial pouches wide, not lobed and without distinct posterior limitation but with slender extension; pouches extending to about 70% of the distance between oral aperture and guiding ring, with distinct "median ridge". Guiding ring about two lip region widths behind oral aperture, 6.5-7.5 μm wide. Odontostyle about 2.0-2.5 μm wide at base: odontophore indistinct, slightly more than half as long as odontostyle. A mucro 1.5-5.5 μm long is present in some specimens in the slender part of the pharynx. Nerve ring generally located about one body width posterior to the odontophore base; in some specimens an additional, smaller nerve ring present one body width behind the main one. Hemizonid distinct, 7-8 μm long, hemizonion about one body width behind hemizonid. Pharyngeal bulb measuring between 20 and 25% of pharynx length, about five times as long as wide. Nucleolus of dorsal gland nucleus about 3.0-3.5 μm in diameter, mostly slightly elongate; nucleoli of the ventrosublateral glands round, about 4 μm in diameter. Locations: DO=9-11%, DN=30-36%, DO-DN=30-41 μm , SN=53-58%. Thus, the arrangement of the nuclei is of the "normal" type. Cardia bluntly conoid.

Genital branches paired, opposed, reflexed antidromously and of about the same length. Dilated chamber of the oviduct separated from the long uterus by a sphincter. Uteri without sperm. Vagina occupying about 70% of corresponding body width, with distinct sphincter and muscles.

Tail hemispherically rounded to bluntly conoid, considerably shorter than anal body diameter. Two caudal pores at each side: one subdorsal and one subventral. Rectum 0.6-0.7 anal body width long;

prerectum length varying from 4 to 9 body diameters. Intestine in some specimens with postrectal extension.

Anomalies. In one female with an odontostyle 139 μm in length an additional odontostyle 146 μm long was present in the pharyngeal tissue, and in another female with a 132 μm long odontostyle a second odontostyle 143 μm in length was present. In two females with well developed female genital branches some ventromedian supplements were present: in one specimen a single one was situated 17.5 μm anterior to the anus (Fig. 1B), in the other specimen three were present, at distances of 60, 76 and 89 μm anterior to the anus (Fig. 1C).

Male. Not found at any of the sampling sites, and none of the females had sperm in the uteri.

Juveniles. Shape of anterior end as in females. The length difference between the odontostyles of the J1 and J2 is conspicuously small. In the J1 the tail is elongate-conoid (Fig. 1G), in the J2 elongate-subcylindrical (Fig. 1H), in the J3 convex-conoid (Fig. 1I), in the J4 almost hemispherical (Fig. 1J). In the J1 and J2 only one (sub)lateral caudal pore is present at each side, in the J3 and J4 one subdorsal and one subventral pore is present. During ontogeny tail length increases very slightly, anal body diameter increases conspicuously.

The specimens examined correspond wholly to Altherr's description, but the odontophore is longer: 69-85 μm vs 50-60 μm . However in most specimens the location of the odontophore base is difficult to determine accurately, thus only in about one third of all specimens was this character positively identified. According to Altherr's description the tail length is equal to the anal body diameter ($c'=1$), but his drawing shows a tail about 0.7 ABW long, and we identified $c'=0.6$ in two type females. In these two females we measured lip region widths of 18 and 19 μm and a cuticle thickness on the tail terminus of 19 and 20 μm , which corresponds to our recently collected specimens.

Diagnosis and relationships. According to the polytomous key for *Longidorus* (Chen *et al.*, 1997) *L. poessneckensis* has the following codes: A 5(6) – B 3(4) – C 34 – D 3 – E 4 – F 345 – G 2 – H 1 – I 1.

Longidorus poessneckensis is most similar to *L. macrosoma*, and the dimensions are practically

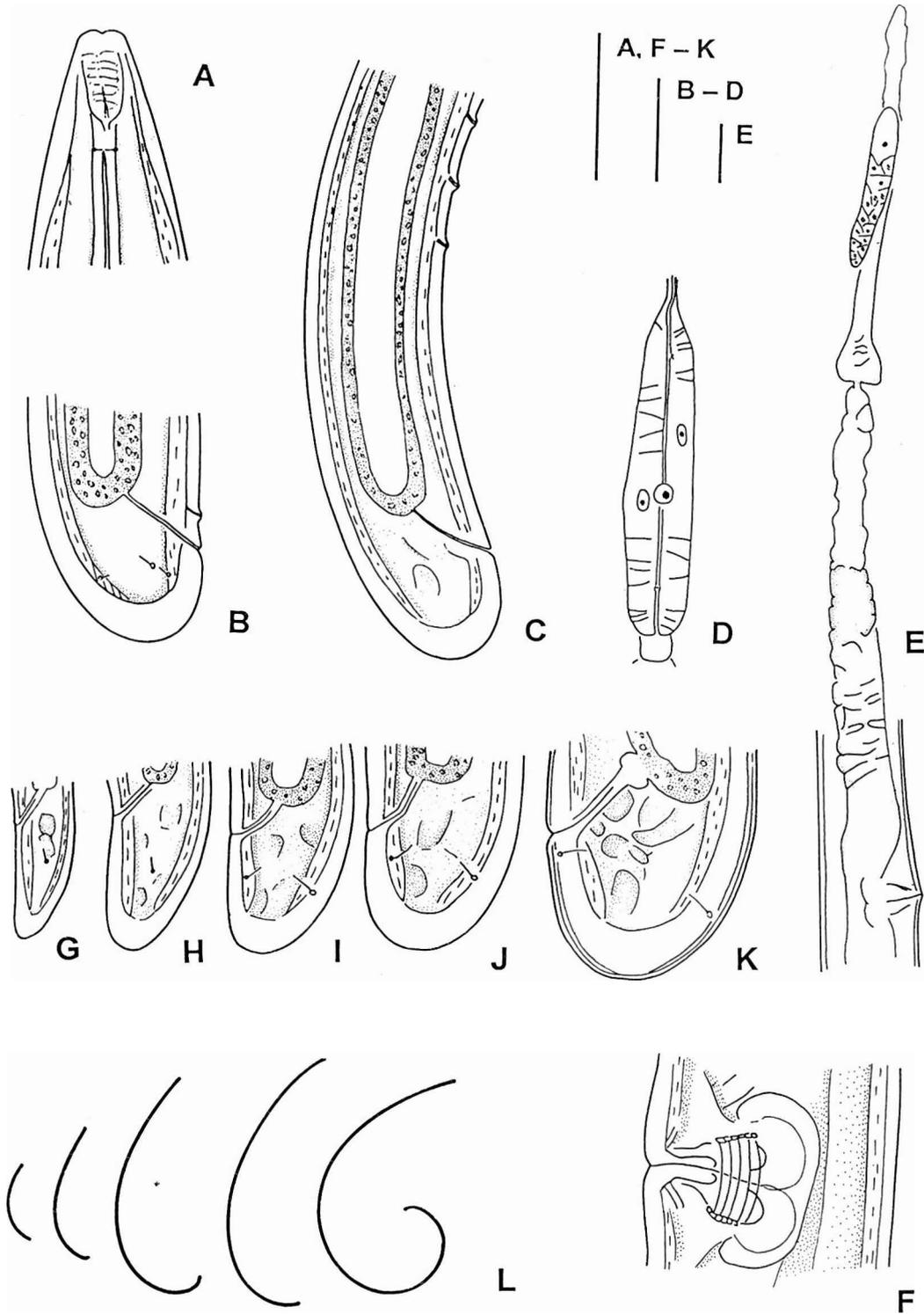


Fig. 1. *Longidorus poessneckensis*. A: Anterior end of female; B, C: Posterior part of two females apparently with male supplements; D: Pharyngeal bulb; E: Vulva and anterior genital branch; F: Vulva and vagina; G-K: Tails of J1, J2, J3, J4 and female, respectively; L: Body attitude of (from left to right) J1, J2, J3, J4 and female (drawings at approximately the same magnification). The scale lines correspond to 50 μ m.

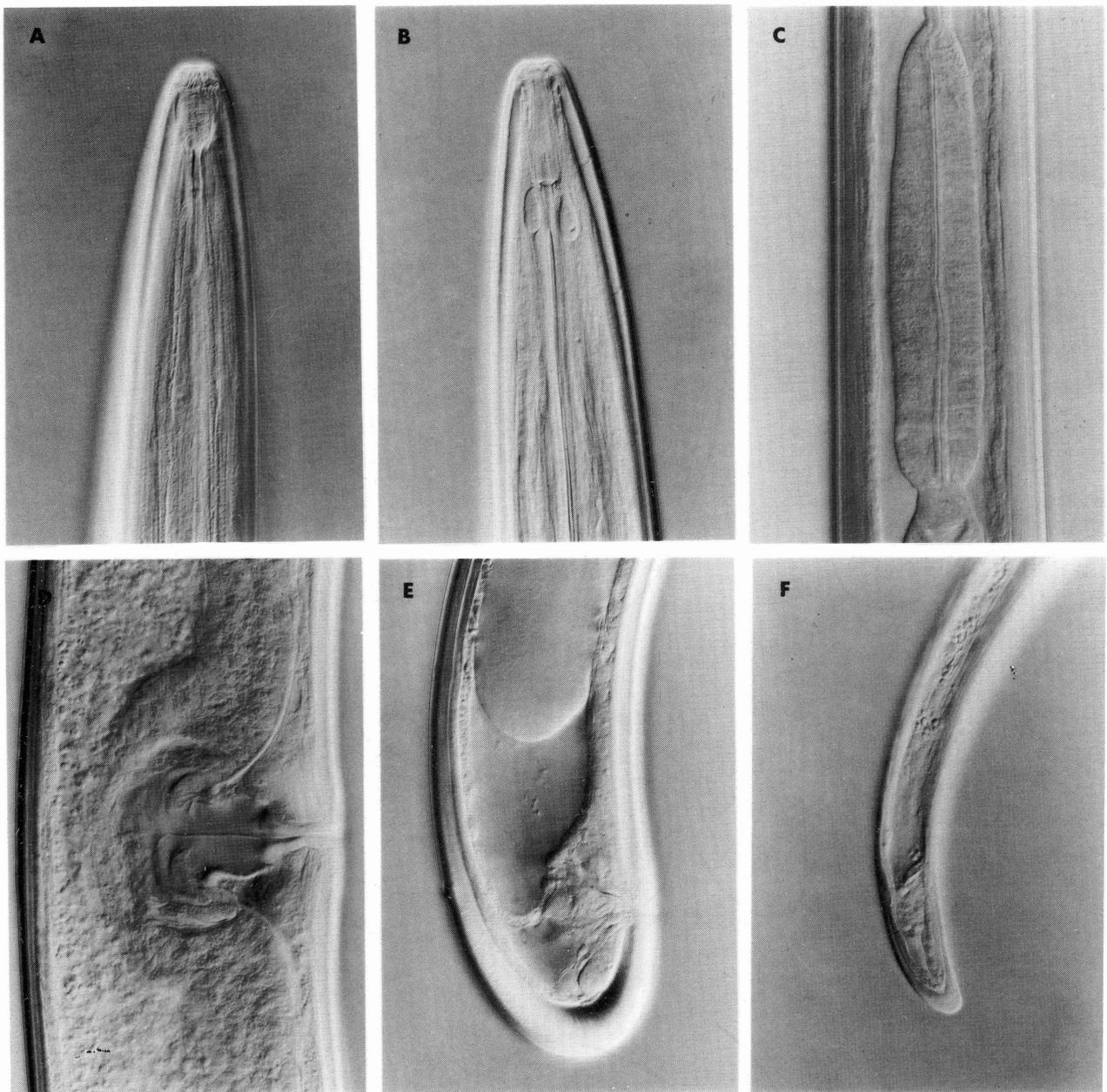


Fig. 2. *Longidorus poessneckensis*. A, B: Anterior end of female; C: Pharyngeal bulb; D: Vagina region; E: Posterior part of female; F: Posterior part of J1.

identical. *L. poessneckensis* differs from *L. macrosoma* by the shape of the lip region (rounded vs truncate), cuticle structure on the tail end (in *L. macrosoma* with thick, distinct median layers); shape of J1 tail (conoid vs subdigitate) and absence of males.

Type material and other specimens. The type specimens of *L. poessneckensis* are deposited at the Station Fédérale de Recherches Agronomiques de Changins, Nyon, Switzerland. Recently collected specimens are deposited at the Biologische Bundesanstalt, Münster, Germany; Nematology

Table 1. Dimensions of *Longidorus poessneckensis* females and juvenile stages (all measurements in μm , except L).

Origin	German populations (original)					Altherr (1974)	Rau (1975)	Slovakia (orig.)
Stage	J1	J2	J3	J4	Females	Females	Females	Female
n	16	11	10	12	20	3	10	1
Length (mm)	1.51 \pm 0.1 (1.41-1.68)	2.50 \pm 0.2 (2.22-2.73)	3.95 \pm 0.4 (3.35-4.60)	5.71 \pm 0.5 (4.89 -6.36)	8.00 \pm 0.9 (6.00-9.36)	8.5-8.9	7.30 (7.15-8.30)	7.10
a	59 \pm 2.6 (55-63)	65 \pm 4.7 (57-74)	77 \pm 3.0 (71-82)	89 \pm 3.4 (85-96)	104 \pm 7.9 (91-124)	95-120	110 (92-131)	96
b	4.4 \pm 0.3 (4.0-4.8)	5.8 \pm 0.3 (5.3-6.2)	7.2 \pm 0.4 (6.8-8.0)	10.0 \pm 0.9 (8.7-12.1)	12.4 \pm 1.2 (10.1-15.0)	15-16	15.9 (14.0-18.2)	12.3
c	41 \pm 2.7 (37-46)	62 \pm 4.8 (55-70)	89 \pm 7.1 (77-103)	126 \pm 11 (108-154)	179 \pm 12 (150-206)	190-210	–	142
c'	2.0 \pm 0.1 (1.8-2.2)	1.3 \pm 0.1 (1.2-1.5)	1.0 \pm 0.1 (0.8-1.1)	0.8 \pm 0.4 (0.7-0.9)	0.7 \pm 0.1 (0.6-0.8)	0.75	0.6 (0.5-0.6)	0.75
V	–	–	–	–	55 \pm 1.6 (52-58)	55-56	58 (54-63)	56
Odontostyle	77 \pm 2.1 (73-81)	82 \pm 2.6 (78-85)	98 \pm 4.2 (89-104)	119 \pm 6.0 (107-130)	133 \pm 6.3 (122-142)	125-130	126 (122-130)	135
Odontophore	–	–	–	–	70 \pm 8.5 (53-83)	50-60	93 (65-99)	60
Spare odontostyle	81 \pm 2.7 (77-87)	100 \pm 7.7 (90-119)	116 \pm 5.6 (107-125)	132 \pm 5.9 (121-140)	–	–	–	–
Guiding ring	21 \pm 0.5 (20-22)	26 \pm 0.7 (24-27)	29 \pm 1.1 (27-31)	34 \pm 1.3 (33-37)	40 \pm 1.4 (36-43)	37-40	39 (37-40)	34
Tail length	38 \pm 3.7 (33-43)	41 \pm 3.4 (36-48)	44 \pm 3.3 (38-51)	46 \pm 3.6 (39-52)	45 \pm 4.8 (37-54)	–	–	50



Fig. 3. Distribution of *Longidorus poessneckensis* in Germany (large dot = type locality).

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Distribution and habitat. *Longidorus poessneckensis* appears to have its distribution in Germany restricted to a few districts. It is known from eleven localities in the central part of the country (Fig. 3). Altherr (1974) received specimens collected from soil around a spring in the area of the Saale river at Langendembach, Pössneck district. We found it at another site in Thuringia, in wet

woodland soil along a small brook with *Fraxinus excelsior*, *Crataegus* sp., *Corylus avellana* and *Lonicera* sp., close to Jena. Rau (1975, 1976) reported it from a moist oak forest (type Fraxino-Ulmetum) along the Innerste river at Himmelsthür near Hildesheim, where we collected it from a moist *Fraxinus-Carpinus-Quercus* forest in September 1981. Our other records are: Fraxino-Ulmetum (*Quercus*, *Ulmus*, *Tilia*, *Fraxinus*) at Harsum near Hildesheim; rather wet *Quercus-Fraxinus* woodland at Landringhausen near Hannover; an *Alnus glutinosa-Acer* forest at Nammen near Minden; river bank vegetation with *Alnus glutinosa*,

Fraxinus excelsior and *Populus nigra* at Kirchbrak near Bodenwerder; a young oak forest in the Deister mountains near Hannover; under river bank vegetation with *Salix* sp. at the Elbe river at Cranz near Hamburg, and at Borstel near Stade; and a beech forest near Kellinghusen, Schleswig-Holstein. The soil types were loam to sandy loam at all sites and the pH ranging from 6.1 to 7.3. At three sites *L. poessneckensis* was found with *L. intermedius*, and at one site with *L. elongatus* (de Man, 1876).

In September 1997 we collected one female and a few juveniles from moist woodland in the southeastern part of the Slovak Republic. Subsequently, *L. poessneckensis* has been recorded for nine additional sites from floodplain forests in three geographical regions of Slovakia (Lišková & Sturhan, 2000). This indicates a rather wide distribution of the species in Europe. In measurements and other morphological characters the specimens from the Slovak Republic closely agree with *L. poessneckensis* from Germany (see Table 1 and Lišková & Sturhan, 2000).

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Sturhan D., Loof P.A.A. Переописание *Longidorus poessneckensis* Altherr, 1974 (Nematoda: Dorylaimida)

Резюме. Вид *Longidorus poessneckensis* Altherr, 1974, первоначально описанный по экземплярам из Тюрингии (Германия), был недавно обнаружен в нескольких пробах, собранных в Центральной Германии, а также в Словакии. Дано переписание вида, включающее описание всех личиночных стадий. Самцы не были обнаружены. *Longidorus poessneckensis* ближе всего к *L. macrosoma*, от которого отличается формой губного отдела, структурой кутикулы на оконечности хвостового конца, формой хвостового конца у личинок 1-й стадии и отсутствием самцов. Лонгидориды этого вида предпочитают, по-видимому, влажные почвы лесов и долин рек.
