

A POLYTOMOUS KEY FOR DETERMINING SPECIES
OF NEMATODES OF THE GENUS LONGIDORUS MICOLETZKY, 1922

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Nematodes of the genus Longidorus are ectoparasites, widely distributed in the world, of the root system of various species of plants, particularly of perennials--fruit and berry cultures--(Cohn, 1975; Lamberti, 1975). The number of valid species of the genus Longidorus is at present 32 (Lamberti, 1975), of which five are vectors of eight strains of the Arabis mosaic and ringspot viruses (Martelli, 1975). In the USSR, the most widely distributed and frequently observed species is Longidorus elongatus, which is found in various agricultural crops in practically all soil-climate zones in the country (Kir'yanova & Krall', 1971; Romanenko, 1973, 1976). Of the other species of Longidorus in the USSR, L. striola and L. tardicauda are well-known. Moreover, in recent years in a number of regions of the European part of the RSFSR [Russian Soviet Federative Socialist Republic] yet two more species - L. attenuatus and Longidorus sp. - were discovered (Romanenko 1976).

The absence in our own literature of identification method for species of the genus Longidorus that are accessible to a wide circle of researchers served as the reason for compiling the proposed key. It is based upon the polytomous principle proposed by Stegarescu (1966) in the similar identification method for species of the genus Xiphinema. The process of diagnosing the species of Longidorus by this principle allows one to take into consideration the greatest number of characteristics and their variability. The polytomous key can be supplemented with the descriptions of new species of a genus without any important changes in the identification system. At the same time, when determining species of nematodes with the help of dichotomous keys, as a rule, many taxa are left outside the system because the number of species is steadily increasing.

In compiling a polytomous key for determining species of Longidorus, we singled out six basic diagnostic characteristics. In coding, each characteristic is designated by a letter [of the Russian alphabet here transliterated] while states of the characteristics are coded with Arabic numerals.

Coding of the states of the basic diagnostic characteristics of nematodes of the genus Longidorus (according to Romanenko, 1972).

A -- Body length

- Up to 3 mm 1
- Over 3, up to 5 mm 2
- Over 5, up to 7 mm 3
- Above 7 mm 4

B -- Form of the lip and head region

- Head distinctly widened and separated from the rest of the body by a distinct constriction 1
- Head cylindrical, not widened, and slightly separated or not separated from the rest of the body 2
- Head narrowly rounded and fused with the rest of the body 3
- Head broadly rounded and fused with the rest of the body 4
- Head more or less conical and sharply tapered, diameter of labial region equal to 0.5 body diameter at the guiding ring 5
- Head rounded, slightly broadened, and separated from the rest of the body by a barely noticeable constriction 6

C -- Tail shape and ratio of tail length to the diameter at level of anus (ratio c').

- Hemispherical, with a rounded terminus, c' less than 1 1
- Conical, with a rounded terminus, c' varies from 1.5 to 2 2
- Conical, c' more than 2, up to 2.5 3
- Conical, with a slightly pointed terminus, c' more than 2.5 4

D -- Distance of the guiding ring from the front end of the body.

- Approximately 1 body diameter 1
- From 1.5 to 2 body diameters 2
- From 2.5 to 3.5 body diameters 3
- Approximately 4 body diameters 4

E -- Length of the odontostyle

- More than 50, up to 70 / μ m 1
- More than 70, up to 100 / μ m 2
- More than 100, up to 150 / μ m 3
- More than 150 / μ m 4

F -- Ratio body length to width (ratio a)

- Up to 50 1
- More than 50, up to 75 2
- More than 75, up to 100 3
- More than 100, up to 125 4
- More than 125 5

In the proposed polytomic tabular key the code states of the six basic diagnostic characteristics of the genus are listed for each Longidorus species. Depending upon the number of its states (4,5 or 6), each diagnostic characteristic is divided into the corresponding number of columns. In this manner, the numerical codes of each of the six diagnostic characteristics occupy a strictly defined column on the given table. Individually variable characteristics are designated in the table by two or even three numerical codes. When determining a nematode species of the genus Longidorus with the help of the proposed table, it is necessary to establish for the subject under examination one or another state for each of the six diagnostic characteristics and mark them with the corresponding code. Then, the data recorded and coded for each specimen investigated is compared with that noted in the same order on the table for each species of the genus Longidorus; on this basis the species of the specimen being identified is established.

In compiling a polytomous key for the determination of the species of the genus Longidorus, original species descriptions as well as dichotomous keys were used (Andrassy, 1970; Lamberti, 1975; Thorne, 1939, 1961; Hooper, 1963).

Below is a list of valid species of the genus Longidorus and of the species requiring additional study (species inquirendae). With certain changes and additions (Mali & Hooper, 1973; Norton & Hoffmann, 1975), materials presented in the work of Lamberti (1975) serve as the basis of this list.

List of valid species of the genus Longidorus.

Type species: L. elongatus (de Man, 1876) Thorne and Swanger, 1936; syn. Dorylaimus elongatus de Man, 1876; D. (Longidorus) elongatus de Man, 1876 (Micol., 1922); Trichodorus elongatus (de Man, 1876) Filipjev, 1921; D. tenuis Linstow, 1879.

Other species: L. africanus Merny, 1966; L. attenuatus Hooper, 1961; syn. nec. L. elongatus (Thorne, 1939); L. belondiroides Heyns, 1966; L. breviannulatus Norton & Hoffmann, 1975; L. caespiticola Hooper, 1961; L. closelongatus Stoyanov, 1964; L. cohni Heyns, 1969; L. congoensis Aboul-Eid, 1970; L. globulicauda Dalmasso, 1969; L. goodeyi Hopper, 1961; L. indicus Prabha, 1973; L. jonesi Siddiqi, 1962; L. juvenilis Dalmasso, 1969; L. laevicapitatus Williams, 1959; L. leptocephalus Hooper, 1961; L. longicaudatus Siddiqi, 1962; L. macromucronatus Siddiqi, 1962; L. macrosoma Hooper, 1961; L. martini Merny, 1966; L. menthasolanus Konicek & Jensen, 1961; L. monile Heyns, 1966; L. moniloides Heyns, 1966; L. nirulai Siddiqi, 1965; L. pisi Edward, Misra & Singh, 1964; L. profundorum Hooper, 1965; L. reneyii Raina, 1966; L. saginus Khan, Seshadri, Weischer & Mathen, 1971; L. siddiqii Aboul-Eid, 1970; syn. Xiphinema brevicaudatum Schuurmans Stekhoven, 1951; L. siddiqii (Siddiqi, 1959) Aboul-Eid, 1970; L. sylphus Thorne, 1939; L. striola Merzheevskaya, 1951; L. taniwha Clark, 1963; L. tardicauda Merzheevskaya, 1951; L. tarjani Siddiqi, 1962; L. vineacola Sturhan & Weischer, 1964; L. euonymus Mali & Hooper, 1973. Species inquirenda: L. brevicaudatus Sch. Stek., 1951; L. heynsi Andrassy, 1970; L. meyli Sturhan, 1963.

Polytomous key for identification of nematode species of the genus Longidorus Micoletzky, 1922.

<u>Longidorus</u>		Coded basic diagnostic characters					
Species	A	B	C	D	E	F	
<i>longicaudatus</i>	1	2	3	3	2	3	
<i>laevicapitatus</i>	1	3	2	3	1	2	
<i>reneyii</i>	1	2	2	1	2	3	
<i>congoensis</i>	1 2	5	1	2	1 2	2	
<i>psi</i>	1 2	1	4	2	1	3 4 5	
<i>africanus</i>	1 2	5	2	3	2	3 4 5	
<i>juvenilis</i>	1 2	1	3 4	2	1	3	
<i>indicus</i>	2	5	3 4	1	3	2	
<i>siddiqii</i>	2	1	4	4	1	3 4 5	
<i>martini</i>	2	1	1	4	2	3 4 5	
<i>belondiroides</i>	2	5	1	4	2	2	
<i>macromucronatus</i>	2	2	1	4	3	3 4	
<i>jonesi</i>	2	2	1	4	3	2	
<i>nirulai</i>	2	2	3	3	2	3 4	
<i>monile</i>	2	4	2	3	2	3 4	
<i>leptocephalus</i>	2	4	2	2	1	3 4	
<i>moniloides</i>	2	2	3	1	2	2	
<i>taniwha</i>	2	5	1	3	3	1 2	
<i>striola</i>	2	5	2	3	x	4	
<i>sylphus</i>	2	2	2	3	x	3 5	
<i>breviannulatus</i>	2 3	2	2	1	2	3 4	
<i>menthasolanus</i>	2 3	1	1 2	1	2	2 3	
<i>tardicauda</i>	2 3	6	1	3	3	3	
<i>closelongatus</i>	3	6	2	2	3	1	
<i>globulicauda</i>	3	6	3	1	2	4	
<i>tarjani</i>	3	4	2	1	4	3 4	
<i>profundorum</i>	3	5	3	1	2	2 3	
<i>attenuatus</i>	3	1	2	3	2	4	
<i>elongatus</i>	3	2	2	3	2 3	3 4 5	
<i>caespiticola</i>	3 4	3	1	2	3	2 3	
<i>goodeyi</i>	3 4	2	1	3	2	2 3 4	
<i>euonymus</i>	4	6	2	1	2		
<i>macrosona</i>	4	5	1	2	3	3 4 5	
<i>vineacola</i>	4	6	1	3	2 3	4 5	
<i>cohni</i>	4	1	4	1	3	5	

Note: x = information absent

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