

SOME SPECIES OF *Helicotylenchus* (NEMATODA: HOPLALAIMIDAE) FROM IRAN*

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Abstract

The genus *Helicotylenchus* with about 250 described species is one the largest genera in order Tylenchida or infraorder Tylenchomorpha. In order to identify the species of *Helicotylenchus*, over 500 soil and root samples collected from rhizosphere of different plants and localities of Iran, during 2009-2010. Soil samples were collected and its nematodes extracted, killed and processed to glycerin. Then the nematodes examined by light microscope, equipped with drawing tube and digital camera. In this study, in addition to 15 species of 26 previously reported species of the genus *Helicotylenchus*, a number of other known species were isolated and identified. Among the identified species, due to morphological and morphometric similarities, *H. indicus*, *H. insignis*, *H. falcatus* and *H. egyptiensis* are discussed in two groups. The ventral tail projection in the first three species usually is shorter than two body annuls width, and in *H. egyptiensis* is as long as two body annuls width or longer. The morphometric characters of the first three species are very similar and for this reason *H. insignis* and some other species were synonymized with *H. indicus* by several authors. However the shape of stylet knobs is different among these species. Stylet knobs are sloping backward in *H. indicus*, but indented forward in *H. insignis*. *H. egyptiensis* has a usually pointed tail tip. *H. insignis* and *H. falcatus*, as new records for Iranian nematode fauna are described. Also the descriptions of *H. indicus* and *H. egyptiensis* which has already been reported form Iran, presented in more details.

Keywords: Fauna, Identification, Morphology, Tylenchida, Tylenchoidea Tylenchomorpha.

See Persian text for figures and tables (Pages ۲۹۷-۳۱۵).

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References

- ABIVARDI, C., IZADPANAH, K., SAFFARANI, A. and SHARAFEH, M. 1970. Plant-parasitic nematodes associated with citrus decline in southern Iran. **Plant Dis. Rep.** 54: 339-342.
- ALI RAMAJI, F., POURJAM, E. and KAREGAR BIDEH, A. 2006. Identification of plant parasitic nematodes from order Tylenchida of some field crops in Jiroft and Kahnoj regions. **Proc. 17th Iran. Plant Protec. Cong., Karaj, Iran.** 485. (Abst.).
- ANDERSON, R. V. 1979. A supplemental key to species of *Helicotylenchus* Steiner, 1945 (Nematoda: Hoplolaimidae) described since 1972 and a description of *H. oscephalus* n. sp. **Can. J. Zool.** 57: 337-342.
- ANDRASSY, I. 2007. **Free-living Nematodes of Hungary, II (Nematoda errantia)**. Hungarian Natural History Museum, Budapest, Hungary. 496 p.
- BAADL, S., MAHDIKHANI MOGHADDAM, E. and ROUHANI, H. 2010. Some species of *Helicotylenchus* found in rapeseed fields of North Khorasan province. **Proc. 19th Iran. Plant Protec. Cong., Tehran, Iran.** P: 553 (Abst.).
- BAADL, S., MAHDIKHANI MOGHADDAM, E. and ROUHANI, H. 2013. Identification of plant parasitic nematodes in rapeseed fields in North Khorasan province. **J. Plant Protec.** 26: 46 [370-379], (In Farsi with English summary).
- BAROOTI, S. and GERAERT, E. 1994. Some plant parasitic nematodes (Tylenchida) from Iran. **22nd Internat. Nematol. Symp., Gent, Belgium,** p. 33.
- BOAG, B. and JAIRAJPURI, M. S. 1985. *Helicotylenchus scoticus* n. sp. and a conspectus of the genus *Helicotylenchus* Steiner, 1945 (Tylenchida: Nematoda). **Syst. Parasitol.** 7: 47-58.
- DE GRISSE, A. 1969. Redescription ou modification de quelques techniques utilisees dans l'etude des nematodes phytoparasitaires. **Meded. Fak. Landbouwwet. Gent,** 34: 351-369.
- DECRAEMER, W. and HUNT, D.J. 2006. Structure and Classification. Pp. 3-32, *In*: PERRY, R. N. and MONES, M. (Eds.), **Plant Nematology**. CABI Pub., King's Lynn, UK.
- ERFANI POOR GHASEMI, V., MAHDIKHANI MOGHADAM, E. and ROUHANI, H. 2011. Identification of plant parasitic nematodes of potato fields in Khorasan Razavi province. **J. Plant Protec.** 25: 31 [243-249], (In Persian with English summary).
- EROSHENKO, A. S. and NGUEN V. T. 1981. [New species of soil nematodes from Vietnam.] **Zool. Zh.** 60: 1882-1886. (In Russian).
- FIROZA, K. and MAQBOOL, M. A. 1994. A diagnostic compendium of the genus *Helicotylenchus* Steiner, 1945 (Nematoda: Hoplolaimidae). **Pakistan J. Nematol.** 12: 11-50.
- FORTUNER, R. 1979. Morphometrical variability in *Helicotylenchus* Steiner, 1945. I. The progeny of a single female. **Rev. Nematol.** 2: 197-202.
- FORTUNER, R. 1984. Morphometrical variability in *Helicotylenchus* Steiner, 1945. 6: Value of the characters used for specific identification. **Rev. Nematol.** 7: 245-264.
- FORTUNER, R. and QUENEHERVE, P. 1980. Morphometrical variability in *Helicotylenchus* Steiner, 1945. 2: Influence of the host on *H. dihystra* (Cobb, 1893) Sher, 1961. **Rev. Nematol.** 3: 291-296.
- FOTEDAR, D. N. & HANDOO, Z. A. 1974. Two new species of *Helicotylenchus* Steiner, 1945 (Hoplolaiminae: Nematoda) from Kashmir, India. **J. Sci. Univ. Kashmir** 2: 57-62.
- FOTEDAR, D. N. and KAUL, V. 1985. A revised key to the species of genus *Helicotylenchus* Steiner, 1945 (Nematoda: Rotylenchoidea). **Indian J. Nematol.** 15:138-147.
- GAUR, H. S. and PRASAD, S. K. 1972. *Helicotylenchus teres* nomen novum for *H. thornei*. **Indian J. Nematol.** 2: 93-94.
- GHADERI, R. KASHI, L. and KAREGAR, A. 2012. **The Nematodes of Iran based on the published reports until 2011**. Education and Agricultural Promotion Publisher, Tehran, Iran, 379 p.
- GOLMOHAMMADZADEH KHIYABAN, N. and BAROOTI, S. 2002. Study of plant parasitic nematode fauna in Baluchestan. **Proc. 15th Iran. Plant Protec. Cong., Kermanshah, Iran.** Pp: 187-188 (Abst.).
- GUPTA, N. K. and CHHABRA, H. K., 1967. *Helicotylenchus thornei* n. sp. (Nematoda: Hoplolaimidae) from a tomato plant field in Ludhiana, Punjab. **Res. Bull. Punjab Univ. Sci.** 17: 323-325.
- HARATI, S. ESKANDARI, A. TANHA MAAFI, Z. and BAROOTI, S. 2010. Identification of eleven plant parasitic nematodes belonging to the family Hoplolaimidae from vegetation of Shahrood and suburbs. **Proc. 19th Iran. Plant Protec. Cong., Tehran, Iran.** 615 (Abst.).
- JABBARI, H. and NIKNAM, GH. 2006. Plant parasitic nematodes of vegetable fields in Tabriz area. **J. Plant Protec.** 22: 95-107.
- KAREGAR, A., GERAERT, E. and KHEIRI, A. 1995. Tylenchs associated with grapevine in the Province of Hamadan, Iran. **Med. Fac. Landbouww. Univ. Gent, 60/3b, Gent, Belgium.** Pp: 1063-1086

- KHAN, S. H. and BASIR, M. A. 1964. Two new species of the genus *Helicotylenchus* Steiner, 1945 (Nematode: Hoplolaimidae) from India. **Proc. Helm. Soc. Wash.** 31: 199-202.
- KHEIRI, A. 1972. Plant parasitic nematodes (Tylenchida) from Iran. **Biologisch Jaurboek Dodonaea** 40: 224-239.
- KRALL, E. L. 1990. **Root parasitic nematodes family Hoplolaimidae**. E. J. Brill Pub. Company, Leiden, 580 p.
- LAL, M. and KHAN, E. 1993. On the taxonomic status of species of *Helicotylenchus* Steiner, 1945. I. having a digitative type tail terminus from India. **Indian J. Nematol.** 23: 110-117.
- MAHDIKHANI MOGHADAM, E. and MOKARAM HESAR, A. 2011. Identification of plant parasitic nematodes of *Rosmarinus officinalis* in campus Ferdowsi University of Mashhad. **J. Plant Protec.** 24: 54 [428-436], (In Farsi with English Summary).
- MARAI, M., MEKETE, T. and TIEDT, L. R. 2005. Description of *Helicotylenchus gerti* sp. n. and new records of some species of *Helicotylenchus* (Steiner, 1945) from Ethiopia (Nematoda: Hoplolaimidae). **J. Nematol. Morph. Syst.** 8: 39-49.
- MULK, M. M. and JAIRAJPURI, M. S. 1975. Nematodes of leguminous crops in India. II. Five new species of *Helicotylenchus* Steiner, 1945 (Hoplolaimidae). **Indian J. Nematol.** 4: 212-221. (1974 published in 1975)
- NANDAKUMAR, C. and KHERA, S. 1970. *Helicotylenchus indicus* Siddiqi, 1963 with certain remarks on the genus *Helicotylenchus* Steiner, 1945 and some of its species. **Indian J. Helminthol.** 22: 56-52.
- PEDRAMFAR, H., POURJAM, E. and KHEIRI, A. 2002. Plant parasitic nematodes associated with rice in Gilan Province. **IRJPP** 37: 285-301.
- PRASAD, S. K., KHAN, E. & CHAWLA, M. L. 1965. Two new species of *Helicotylenchus* from soil around maize roots in India. **Indian J. Entomol.** 27: 182-184.
- RAZJIVIN, A. A., O'RELLY, J. P. and PEREZ MILIAN, J. R. 1973. Nuevas especies de nematodes (Nematoda: Dorylaimidae y Hoplolaimidae) parasitos de la cana de azucar en Cuba. **Poeyana, Instituto de Zoologia, Cuba** 108: 1-12.
- RAZZAZ HASHEMI, S. R. 2010. Identification of important parasitic nematodes of pistachio orchards in Qazvin province. **Proc. of the 19th Iran. Plant Protec. Cong., Tehran, Iran.** 561.
- ROMANA, J. 1965. Nematodes of Puerto Rico, the genus *Helicotylenchus* Steiner, 1945 (Nematoda: Hoplolaiminae). **Technical Paper, University of Puerto Rico Agricultural Experiment Station**, 41, 23p.
- SAXENA, P. K., CHHABRA, H. K. and JOSHI, R. 1973. *Helicotylenchus persici* n. sp. (Nematoda: Rotylenchoidinae) from India. **Zool. Anz.** 189: 257-259.
- SEINHORST, J. W. 1962. Modification of the elutriation method for extracting nematodes from soil. **Nematologica** 8: 117-128.
- SHAMSI, M. A. 1979. On the validity of *Helicotylenchus plumariae* and *H. insignis* (Nematoda: Hoplolaimidae). **Indian J. Nematol.** 7: 66-67.
- SHER, S. A. 1966. Revision of the Hoplolaiminae (Nematoda) VI. *Helicotylenchus* Steiner, 1945. **Nematologica** 12: 1-56.
- SIDDIQI, M. R. 1963. Two new species of the genus *Helicotylenchus* Steiner, 1945. (Nematoda: Hoplolaiminae). **Z. Paraitenk.** 23: 239-244.
- SIDDIQI, M. R. 1972. On the genus *Helicotylenchus* Steiner, 1945 (Nematoda: Tylenchida), with descriptions of nine new species. **Nematologica** 18: 74-91.
- SIDDIQI, M. R. 2000. **Tylenchida Parasites of Plants and Insects. 2nd ed.**, CABI Pub., Wallingford, Oxon, UK, 833 p.
- TANH AMAAFI, Z. and KHEIRI, A. 1991. Identification of some citrus parasitic nematodes from Hormozgan Province. **Proc. of the 9th Iran. Plant Protec. Cong., Mashhad, Iran,** 180(Abst.).
- TARJAN, A. C. 1964. Two new mucronate-tailed spiral nematodes (*Helicotylenchus*: Hoplolaiminae). **Nematologica** 10: 185-191.
- ZEIDAN, A. B. and GERAERT, E. 1990. *Helicotylenchus* from Sudan, with description of two new species (Nematoda: Tylenchida). **Nematol. medit.** 18: 33-45.