

SOME SPECIES OF *Paratylenchus* (NEMATODA: TYLENCHULIDAE) FROM IRAN

R. GHADERI * and A. KAREGAR ¹

(Received : 5.5.2012; Accepted : 2.1.2013)

Abstract

After studying of the plant parasitic nematodes, collected from different plants and regions of Iran, seven species belong to *Paratylenchus*, including *P. arcuatus*, *P. colinus*, *P. conicephalus*, *P. neoprojectus*, *P. similis*, *P. straeleni* and *P. veruculatus* were identified. Among them, *P. colinus*, *P. neoprojectus* and *P. veruculatus* are new records for Iranian nematode fauna that full description of them and also that of *P. straeleni* were given. These species were collected and identified from different hosts and localities as follows: *P. colinus* from the rhizosphere of apple trees in Divandareh, Kurdistan province, *P. neoprojectus* from both shade-trees in Tabriz and apricot seedlings in Sanandaj, and *P. veruculatus* from sugarcane fields of Khuzestan province. Furthermore, a dichotomous key for identification of Iranian species of this genus was presented.

Keywords: Plant parasitic nematodes, key, *Paratylenchus*, *Gracilacus*, Paratylenchinae.

See Persian text for figures and tables (Pages ۱۳۷-۱۵۶).

*: Corresponding Author, Email: rghsh2009@gmail.com

1. PhD. Student and Assoc. prof. of Plant Pathol., College of Agric., Shiraz Univ., Shiraz, Iran.

References

- ABIVARDI, C. 1970. Occurrence of *Paratylenchus hamatus* on citrus in Iran and its sensitivity to two nematicides under laboratory conditions. **Plant Dis. Rep.** 54: 1085-1088.
- ALI RAMAJI, F., POURJAM, E. and KAREGAR, 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., Tehran, Iran**, 485 (Abst.).
- ANDERSON, R.V. and KIMPINSKI, J. 1977. *Paratylenchus labiosus* n. sp. (Nematoda: Paratylenchidae) from Canada. **Can. J. Zoo.** 55: 1992-1996.
- ANDRÁSSY, I. 2007. **Free-living nematodes of Hungary, II (Nematoda errantia)**. Hungarian Natural History Museum, Budapest, Hungary. 496 pp.
- BAADL, S., MAHDIKHANI MOGHADAM, E. and ROUHANI, H. 2010. Identification of plant parasitic nematodes in rapeseed fields in North Khorasan province. **Proc. 19th Iran. Plant Protec. Cong., Tehran, Iran**, 552(Abst.).
- BAJAJ, H.K. 1987. On the species of *Paratylenchus* Micoletzky (Nematoda: Criconematina) from Haryana, India. **Indian J. Nematol.** 17: 318-326.
- BAROOTI, S. 1981. Record of two species of nematodes from Iran. **Appl. Ent. and Phytopathol.** 49: 27-30 [103-106], (In Farsi with English Summary).
- BAROOTI, S. 1987. **A list of plant parasitic nematodes of Iran (collected between 1956 to 1986)**. Monograph P.P.D.R. Institute. 34 pp.
- BAROOTI, S. 1998. The plant nematode fauna of cultivated soil of East-Azərbayjan, Ardabil and Moghan. **Appl. Ent. and Phytopathol.** 66: 32-35 [79-98], (In Farsi with English Summary).
- BAROOTI, S., KHEIRI, A. and BABAJANI, G. 2000. Three species of plant parasitic nematodes (Tylenchida) new for nematode fauna of Iran. **Proc. 14th Iran. Plant Protec. Cong., Isfahan, Iran**, 390(Abst.).
- BROWN, G.L. 1959. Three new species of the genus *Paratylenchus* from Canada (Nematoda: Criconematidae). **Proc. Helminth. Soc. Wash.** 26: 1-8.
- BRZESKI, M.W. 1995. Paratylenchinae: morphology of some known species and descriptions of *Gracilacus bilineata* sp. n. and *G. vera* sp. n. (Nematoda: Tylenchulidae). **Nematologica** 41: 535-565.
- BRZESKI, M.W. 1998. **Nematodes of Tylenchida in Poland and temperate Europe**. Warszawa, Poland, Muzeum I Instytut Zoologii PAN. 397 pp.
- BRZESKI, M.W. and HANEL, L. 1999. Paratylenchinae: postembryonic developmental stages of *Paratylenchus straeleni* (De Coninck, 1931) and *P. steineri* Golden, 1961 (Nematoda: Tylenchulidae). **Nematology** 1: 673-680.
- BRZESKI, M.W. and HANEL, L. 2000. Paratylenchinae: evaluation of diagnostic morpho-biometrical characters of females in the genus *Paratylenchus* Micoletzky, 1922 (Nematoda: Tylenchulidae). **Nematology** 2: 253-261.
- BRZESKI, M.W., HANEL, L., NICO, A.I. and CASTILLO, P. 1999. Paratylenchinae: redescription of *Paratylenchus arcuatus* Luc & de Guiran, 1962, a new senior synonym of *P. nainianus* Edward & Misra, 1963 (Nematoda: Tylenchulidae). **Nematology** 1: 375-380.
- CHITAMBAR, J.J., BABAJANI, GH. and MINASSIAN, V. 2001. SEM observations and morphometrics of *Hemicycliophora belemnii* Germani & Luc, 1973 and *Paratylenchus bukowinensis* Micoletzky, 1922 (Nematoda: Criconematoidea) from Iran. **Nematology** 8: 743-751.
- DE GRISSE, A.T. 1969. Redescription ou modification de quelques techniques utilisées dans l'étude des nématodes phytoparasitaires. **Meld. Rijksfacul. der landbouw. Gent** 34: 351-369.
- DECRAEMER, W. & HUNT, D.J. 2006. Structure and classification. Pp: 3-32. In: R.N. Perry & M. Moens. (eds). **Plant Nematology**. CABI Pub., Wallingford, UK,
- DOUCET, M.E. 1994. New data on *Gracilacus colina* Huang & Raski, 1986 (Nematoda: Criconematoidea). **Fund. appl. Nematol.** 17: 117-121.
- ESSER, R.P. 1992. A diagnostic compendium to species included in Paratylenchinae Thorne, 1949 and Tylenchocriconematinae Raski & Siddiqi, 1975 (Nematoda: Criconematoidea). **Nematologica** 38: 146-163.

- FILIPJEV, I.N. 1934. **Nematody vrednye I poleznye v sel'skom khozyaistve (harmful and useful nematodes in agriculture)**. Moscow-Leningrad. 440 pp.
- GERAERT, E. 1965. The genus *Paratylenchus*. **Nematologica** 11: 301-334.
- GHARAKHANI, A., POURJAM, E. and KAREGAR, A. 2007. Some plant parasitic nematodes (Criconematoidea and Longidoridae) in Kerman Province orchards. **Iran. J. Plant Pathol.** 43: 135-139 [372-397]. (In Farsi with English Summary).
- HUANG, C.S. and RASKI, D.J. 1986. Four new species of *Gracilacus* Raski, 1962 (Criconematoidea: Nemata). **Revue Nématol.** 9: 347-356.
- JABBARI, H., NIKNAM, G., PANAHANDAH, J. and BOLAND NAZAR, S. 2006. Study on the biodiversity of plant parasitic nematodes (Criconematoidea Taylor, 1936) in vegetable fields of Tabriz. **Proc. 17th Iran. Plant Protec. Cong., Tehran, Iran.** 209(Abst.).
- JAHANSHAHI, M., POURJAM, E. and KHEIRI, A. 2006. Tylenchs associated with Jiroft orchards and a description of four newly found species for the nematode fauna of Iran. **Iran. J. Agric. Sci.** 37: 18 [529-543]. (In Farsi with English Summary).
- KAREGAR, A., GERAERT, E. and KHEIRI, A. 1995. Tylenchs associated with grapevine in the province of Hamadan, Iran. **Med. Fac. Landbouw. Univ. Gent, 47th**. Pp: 1063-1086.
- KASHI, L., KAREGAR, A. and KHEIRI, A. 2009. *Paratylenchus paraperaticus* sp. n. (Tylenchida: Tylenchulidae) found in the rhizosphere of walnut trees in Hamadan province, Iran. **Nematology** 11:641-647.
- KHAN, E., PRASAD, S.K. and MATHUR, V.K. 1967. Two new species of the genus *Paratylenchus* Micoletzky, 1922 (Nematoda: Criconematidae) from India. **Nematologica** 13: 79-84.
- KHEIRI, A. 1972. Plant parasitic nematodes (Tylenchida) from Iran. **Biol. J. Dodonea** 40: 224-239.
- LUC, M. and DE GUIRAN, G. 1962. Deux nouveaux *Paratylenchus* (Nematoda-Criconematidae) de Cote D'ivoire. **Nematologica** 7: 133-138.
- MAGGENTI, A.R., LUC, M., RASKI, D.J., FORTUNER, R. and GERAERT, E. 1988. A reappraisal of Tylenchina (Nemata) 11. List of generic and supra-generic taxa, with their junior synonyms. **Revue Nématol.** 11: 177-188.
- MICOLETZKY, H. 1922. Die Freilebenden Erd-Nematoden. **Archiv für Naturgeschichte**, Berlin A. 87: 1-650.
- NGUYEN, C.N., BALDWIN, J.G. & CHOI, Y.E. 2004. New records of *Paratylenchus* Micoletzky, 1922 (Nematoda: Paratylenchinae) from Viet Nam with description of *Paratylenchus laocaiensis* sp. n. **J. Nem. Morph. Sys.** 7, 51-75.
- NIKNAM, G. and KHEIRI, A. 1997. Identification of plant parasitic nematodes (Tylenchida) of Moghan Agrobusiness Corporation farms. **Agri. Sci.** 7: 32 [1-32]. (In Farsi with English Summary).
- NOURI, S., KHEIRI, A. and KAREGAR, A. 2004. Identification of plant parasitic nematodes fauna (Tylenchida) of fruit trees in Zanjan region. **Proc. 16th Iran. Plant Protec. Cong., Tabriz, Iran,** 434(Abst.).
- PRAMODINI, M., MOHILAL, N. and DHANACHAND, CH. 2006. *Gracilacus vitecus* sp. n. and record of *G. raskii* Phukan & Sanwal from Manipur, India. **Ind.J. Nematol.** 36: 272-276.
- RASKI, D.J. & LUC, M. 1987. A reappraisal of Tylenchina (Nemata). 10. The superfamily Criconematoidea Taylor, 1936. **Revue Nématol.** 10: 409-444.
- RASKI, D.J. 1962. Paratylenchidae n. fam. with descriptions of five new species of *Gracilacus* n. g. and an emendation of *Cacopaurus* Thorne, 1943, *Paratylenchus* Micoletzky, 1922 and Criconematidae Thorne, 1943. **Proc. Helminth. Soc. Wash.** 29, 189-207.
- RASKI, D.J. 1975. Revision of the genus *Paratylenchus* Micoletzky, 1922 and descriptions of new species. Part I of three parts. **J. Nematol.** 7, 15-34.
- RASKI, D.J. 1976. Revision of the genus *Paratylenchus* Micoletzky, 1922 and descriptions of new species. Part III of three parts-*Gracilacus*. **J. Nematol.** 8: 97-115.
- RASKI, D.J. 1991. Tylenchulidae in agricultural soils. Pp: 761-794. In: W.R. Nickle. (Ed.). **Manual of agricultural nematology**. Marcel Dekker Inc., New York, USA,

- SIDDIQI, M.R. 2000. **Tylenchida Parasites of Plants and Insects**. 2nd ed., CABI Pub., Wallingford, UK, 833 p.
- SOLOV'VA, G.I. 1975. **Parasitic Nematodes of Woody and Herbaceous Plants, a Review of the Genus *Paratylenchus* Micoletzky, 1922 (Nematoda: Criconematidae)**. Amerind Pub., New Delhi, India. 134 p.
- Sturhan, D. 1977. First record of the Persian sessile nematode *Cacopaurus pestis* in Iran. **Nematol. Med.** 5: 125-126.
- TANHA MAAFI, Z. and KHEIRI, A. 1999. Some nematodes parasites of citrus in Hormozgan province. **Proc. 9th Iran. Plant Protec. Cong., Mashhad, Iran**, 180(Abst.).
- TAYLOR, A.L. 1936. The genera and species of the Criconematinae a subfamily of the Anguillulidae (Nematoda). **Trans. Amer. Microb. Soc.** 55: 391-421.
- THORNE, G. 1949. On the classification of the Tylenchida, new order (Nematoda: Phasmodia). **Proc. Helminth. Soc. Wash.** 16: 37-73.
- VAN DEN BERG, E., ESKANDARI, A., TIEDT, L.R. and KAREGAR, A. 2011. *Paratylenchus conicephalus* sp. n. from Iran with notes on *P. similis* Khan, Prasad & Mathur, 1967 (Nematoda: Paratylenchinae). **Nematology** 13: 529-537.
- WHITHEAD, A. G. and HEMMING, J. R. 1965. A comparison of some Quantitative methods of extracting vermiform nematodes from soil. **Annu. Appl. Bio.** 55: 25-38.
- YU WU, L. 1962. *Paratylenchus veruculatus* n. sp. (Criconematidae: Nematoda) from Scotland. **Can. J. Zoo.** 40: 773-775.
- YU WU, L. and HAWN, E.J. 1975. *Paratylenchus neoprojectus* n. sp. (Paratylenchinae: Nematoda) from alfalfa fields in Alberta, Canada. **Can. J. Zoo.** 53: 1841-1843.
- YU WU, L. and TOWNSHEND, J.L. 1973. *Paratylenchus tateae* n. sp. (Paratylenchinae, Nematoda). **Can. J. Zoo.** 51:109-111.

Archive of SID