



First record of female intersex in *Hirschmanniella shamimi* Ahmad, 1972 (Nematoda: Pratylenchidae), with a checklist of intersexes in plant nematodes

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Abstract

Two intersexes of *Hirschmanniella shamimi* are described and illustrated for the first time from soil samples around rice roots in Guangzhou, Guangdong Province, China. The two intersexes have developed female reproductive organs as well as rudimentary male sexual characters. A checklist of intersexes in plant nematodes is also given here.

Key words: *Hirschmanniella shamimi*, female intersex, new record, plant nematodes, China

Introduction

Intersexuality has been found throughout the animal kingdom (Reinboth 1975) with many documented occurrences in nematodes, including insect-parasitic, animal-parasitic, soil free-living, marine free-living and plant-parasitic forms (Steiner 1923; Chitwood 1949; Hirschmann and Sasser 1955; Triantaphyllou 1960; Triantaphyllou and Hirschmann 1964; Goseco and Ferris 1973; Jairajpuri *et al.* 1977). However, intersexuality is uncommon in plant nematodes. Since Chitwood (1949) first reported an intersex in *Meloidogyne javanica* (Treub, 1885) Chitwood, 1949, intersexes in 9 genera, including *Meloidogyne*; *Ditylenchus*; *Aphelenchoides*; *Xiphinema*; *Longidorus*; *Tylenchorhynchus*; *Heterodera*; *Helicotylenchus* and *Hirschmanniella*, and about 30 species of plant nematodes have been recorded. In several species, *e.g.*, *D. triformis* Hirschmann & Sasser, 1955, *X. attorodorum* Luc, 1961, *T. nilgiriensis* Seshadri, Muthuskrishnan & Shunmugan, 1967 [= *T. capitatus* Allen, 1955], *A. composticola* Franklin, 1957, and *L. distinctus* Lamberti, Choleva & Agostinelli, 1983, only female intersex phenotypes have been observed (Hirschmann and Sasser 1955; Luc 1961a; Seshadri 1967; Anderson and Kimpinski 1977; Liškova 2007), while in *e.g.*, *X. insigne* Loos, 1949, *Heterodera trifolii* Goffart, 1932 and *Hirschmanniella oryzae* (Soltwedel, 1889) Luc & Goodey, 1963, only male intersexes have been recorded (Bajaj and Jairajpuri 1977; Wouts 1978; Kanwar *et al.* 1992). In other species, *e.g.*, *M. javanica* and *M. incognita* (Kofoid and White, 1919) Chitwood, 1949, both female and male intersex phenotypes have been reported (Chitwood 1949; Ishibashi 1965; Davide and Triantaphyllou 1968).

During a study of the genus *Hirschmanniella*, two females displaying intersexuality in *H. shamimi* Ahmad, 1972 were collected and observed among a mixed population of *Hirschmanniella*, including *H. mucronata* (Das, 1960) Luc and Goodey, 1963, *H. oryzae* and *H. shamimi*, from soil samples around rice roots in Guangzhou, Guangdong Province, China. Such a case of female intersexes is reported here for the first time in *H. shamimi*. In order to facilitate future research in intersexuality in plant nematodes, a checklist of intersexes in plant nematodes is also provided here.