

**THE FOLIAR NEMATODE, *APHELENCHOIDES FRAGARIAE*, ON JERUSALEM  
ARTICHOKE (*HELIANTHUS TUBEROSUS*) AND WEIGELA (*WEIGELA SUBSESSILIS*)**

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ABSTRACT

Khan, Z., S. H. Son, H. S. Moon, S. G. Kim, H. D. Shin, and Y. H. Kim. 2007. The foliar nematode, *Aphelenchoides fragariae*, on Jerusalem artichoke (*Helianthus tuberosus*) and weigela (*Weigela subsessilis*). *Nematropica* 37:335-337.

Severe infestations of the foliar nematode, *Aphelenchoides fragariae*, were observed on leaves of two ornamental plants, Jerusalem artichoke (*Helianthus tuberosus*) and weigela (*Weigela subsessilis*), growing in natural areas in Gyeonggi and Gwangjeon provinces, Korea. The symptoms observed on both host plants were typical of foliar nematode infection and consisted of leaf blotching, discoloration and browning of tissues, tan-colored interveinal necrotic lesions and large dead patches of necrotic tissues. *Aphelenchoides fragariae* was isolated from all diseased leaf tissues; no fungus or bacterium was associated with the symptoms. This is the first report of *A. fragariae* occurring on *H. tuberosus* and *W. subsessilis*. *Key words:* *Aphelenchoides fragariae*, host record, Korea, symptomology.

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RESUMEN

Khan, Z., S. H. Son, H. S. Moon, S. G. Kim, H. D. Shin, y Y. H. Kim. 2007. El nematodo foliar, *Aphelenchoides fragariae*, en aguaturma (*Helianthus tuberosus*) y weigela (*Weigela subsessilis*). *Nematropica* 37:335-337.

Se observaron infestaciones severas del nematodo foliar, *Aphelenchoides fragariae*, en las hojas de dos plantas ornamentales, aguaturma (*Helianthus tuberosus*) y weigela (*Weigela subsessilis*), en áreas naturales en las provincias de Gyeonggi y Gwangjeon, Corea. Los síntomas observados en ambos hospedantes son típicos de infección por nematodos foliares, que incluyen manchas, pardeamiento de tejidos, lesiones necróticas intervenales y parches grandes de tejido necrótico. Se aisló *Aphelenchoides fragariae* de todos los tejidos foliares afectados; y no se encontraron hongos o bacterias asociados con los síntomas. Este es el primer reporte de *A. fragariae* en *H. tuberosus* y *W. subsessilis*.

*Palabras clave:* *Aphelenchoides fragariae*, registro de hospedantes, Corea, sintomatología.

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The foliar nematode, *Aphelenchoides fragariae* (Ritzema Bos, 1891) Christie, 1923 is an ecto- and endoparasite of the above ground parts of plants. *Aphelenchoides fragariae* is commonly associated with strawberries, on which it causes strawberry crimp disease. It is also economically important on ornamental plants including ferns, and members of Liliaceae, Primu-

laceae and Ranunculaceae, and occurs in many countries (Dunn, 1997). In Korea, *A. fragariae* is a common pest of strawberry (Park *et al.*, 2005), but has also been reported on several other plants, including ornamentals (Choi, 2001). However, this is the first report of *A. fragariae* on Jerusalem artichoke (*Helianthus tuberosus* L.) and weigela (*Weigela subsessilis* (Nakai) Bailey).

*Helianthus tuberosus* is a type of sunflower in the Asteraceae family that is grown for its edible tuberous roots, as well as its attractive yellow flowers. This is a large, multibranched perennial plant with rough, sandpapery leaves and stems, and numerous yellow flowers. *Weigela subsessilis* is in the family Caprifoliaceae and is a deciduous shrub well known for its spring-flowers which are of considerable ornamental value. It is endemic to the Korean peninsula.

During routine disease surveys in Korea in 2004 and 2006, severe angular spot symptoms were found on leaves of *H. tuberosus* at Gawanak Arboretum, Anyang in Gyeonggi province, and on leaves of *W. subsessilis* at a natural ecological park of Hongcheong and mountainous area of Chuncheon in Gwangneon province. The detailed symptoms observed on both host plants were typical of foliar nematode infection; leaf blotching, discoloration and browning of tissues, tan-colored interveinal lesions, necrotic and large dead patches of tissues (Fig. 1A). The initial symptoms on *H. tuberosus* appeared as water-soaked irregular lesions that develop between the leaf veins

and, as damage increased, the tissues become necrotic. No fungus or bacterium was associated with the symptoms, but nematodes were extracted from the diseased tissues of both plants using the Baermann funnel method (Agrios, 2005).

The nematodes extracted were killed in water heated to 60°C for one minute and then fixed in 4% formalin. For taxonomic studies some specimens were transferred to glycerine by the methods of Seinhorst (1959) and mounted on glass slides. Measurements were made with an ocular micrometer. Nematode identification was based on the morphological analysis of females and males, which fitted that of *A. fragariae* as given by Choi (1977) from Korea and to those described by Hunt (1993). Morphological characteristics included a slender body, 620-895 µm long, a cuticle which was finely and transversely striated, about 0.5 µm wide at mid-body, and a lateral field with a narrow band with two incisures. The lip region was almost continuous with the body and was 4.0-4.5 µm wide. The stylet was slender, 10-12 µm long with basal knobs minute but distinct, with males occurring as frequently as females.

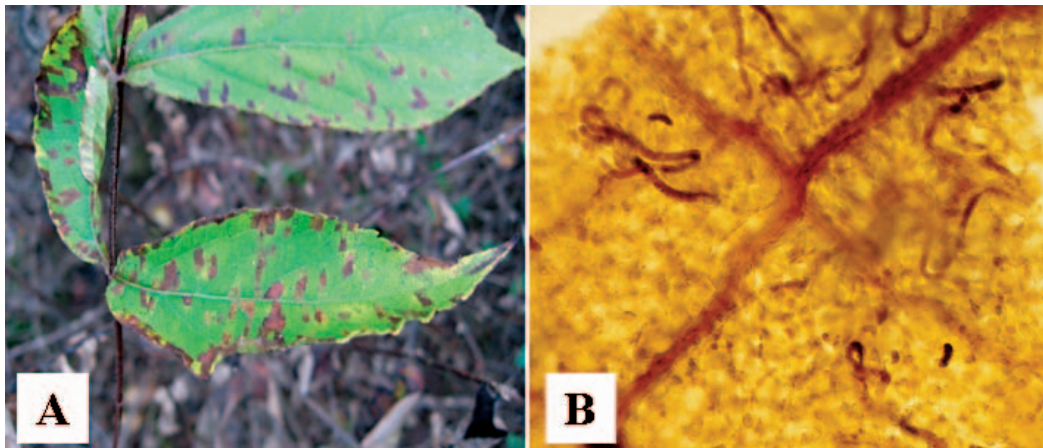


Fig. 1. Symptoms caused by *Aphelenchoides fragariae* on *Weigela subsessilis* and *Helianthus tuberosus*. A) *Weigela* leaf showing dark brown angular necrotic lesions. B) *Helianthus tuberosus* leaf tissues colonized by *A. fragariae*.

Necrotic tissues were also excised from infested leaves and stained with 0.07% bromophenol blue to enhance observation of the nematodes inside the tissues (Kim *et al.*, 1986). *Aphelenchoides fragariae* was found in all the diseased leaf tissues (Fig. 1B). Plants from which *A. fragariae* was obtained were several years old.

It is concluded that *A. fragariae* can be a damaging pest of *H. tuberosus* and *W. subsessilis* in Korea, and can serve as a source of infestation to other host plants such as strawberry. Management of this pest in park and other natural areas is difficult. Removing and destroying all infected leaves and plants can help reduce spread of this nematode, but infected plants are difficult to disinfest of all nematodes. It is best to remove and destroy all plants that show any symptoms of infection, or if an individual plant is of high value, combinations of nematicides and hot water treatment may be used to disinfest the plant.

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