Diseases Caused by Nematodes

First Report of *Meloidogyne arenaria* on Roots of *Grona triflora* in Guangdong Province, China

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Grona triflora (*Desmodium triflorum*), a perennial herbaceous legume, is widely distributed in southern China. *G. triflora* has antipyretic, antiseptic, and expectorant properties and can therefore be used as a phytomedicine (Ghosal et al. 1973). In July 2020, roots of *G. triflora* were investigated for nodules and rhizobia collection at the Shibaluohan Mountain Forest Park of Guangzhou. Root galls induced by a root-knot nematode were observed on 90% of the *G. triflora* samples (in a 200 m² plot) and the infested plants had yellow, small, and withered leaves compared with the healthy ones. The number of galls on a *G. triflora* root ranged from 43 to 92 and the population densities of second stage juveniles (J2s) ranged from 573 to 894 per 100 cm³ soil surrounding the plant. The female perineal patterns showed a low dorsal arch, with lateral field marked by forked and broken striae, no punctate markings between the anus and tail terminus, which matched with the description of *Meloidogyne arenaria* (Hartman and Sasser 1985). The J2s had the following morphometric characters ($n = 15$): body length = $501.05 \pm 23.71 \mu\text{m}$; body width = $17.14 \pm 1.23 \mu\text{m}$; DGO = $3.13 \pm 0.27 \mu\text{m}$; stylet length = $12.97 \pm 1.38 \mu\text{m}$; tail length = $58.02 \pm 4.77 \mu\text{m}$; hyaline tail terminus = $10.08 \pm 0.65 \mu\text{m}$. DNA from four female nematodes was isolated for PCR-based diagnostic analyses. A fragment between the *COII* and

LrRNA genes of the mitochondrial DNA was amplified with primers C2F3/1108 (Powers and Harris 1993). In addition, a 28S ribosomal DNA D2/D3 region was amplified with primers MF/MR (Hu et al. 2011). The amplicons were sequenced (GenBank nos. MW315989 and MW307358). Nucleotide BLAST results indicated that both sequences show 100% identity with corresponding *M. arenaria* sequences of isolates from various countries such as Brazil, China, Myanmar, and Vietnam (e.g., MK033428, JQ446377, KY293688, and MK026624). For further confirmation, sequence characterized amplified region (SCAR) PCR was employed using the *M. arenaria* specific primers Far/Rar (Zijlstra et al. 2000). The amplicon was also sequenced (GenBank no. MW315990). The nucleotide BLAST results showed >99% identity with *M. arenaria* isolates from Indonesia and Argentina (KP234264, KP253748, and MK015624). Greenhouse tests were conducted to analyze the capacity of *M. arenaria* to induce galls on *G. triflora* roots. The *G. triflora* seeds were collected from the sampling plot and germinated on 0.8% (w/v) agar plates. Then the seedlings were planted in 14 cm deep, 15 cm diameter pots filled with sterilized soil from sampling plot. Every seedling was inoculated with 2,000 J2s ($n = 15$) and plants without J2s were used as a control. Two months later, galls were observed for inoculated roots while no galls were formed on roots of control plants. An average of 13,300 J2s and eggs of *M. arenaria* (reproduction factor = 6.65) were recovered from the root. Stanton and Rizo (1988) found that *G. triflora* was susceptible to *M. javanica* in Australia, and Ogbuji (1978) reported that a population of *M. incognita* reproduced on roots of *G. triflora* in Nigeria after artificial inoculation. To our knowledge, this is the first report on *G. triflora* parasitized by *M. arenaria* in Guangdong Province. *M. arenaria* has potential to infest local, economically important plants like citrus, pomelo, sugarcane, maize, and peanut. As *G. triflora* is widely distributed in southern China, there is the risk of spreading *M. arenaria* into agricultural and horticultural systems, which will cause yield loss and economic impacts.

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