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A COMPARISON AMONG DIAGNOSTIC MEANS USED TO IDENTIFY ROOT-KNOT NEMATODES (*MELOIDOGYNE* SPECIES AND RACES) FROM JORDAN

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Abstract

A survey of the root-knot nematodes (RKNs), *Meloidogyne* spp., was conducted in Jordan during May 2002 to August 2003. The survey involved a total of 83 populations collected from various irrigated vegetable crops and fruit trees grown in several climatically diverse districts of Jordan. Each population was maintained from single egg-mass and subjected to identification and characterization. Identification to species and race levels and characterization of the nematode populations was based on a combination of methods including nematode morphology, host preference (based on the North Carolina differential host test), cytogenetics, and DNA fingerprinting. Seventy of the 83 populations were identified as *M. javanica,* five as *M. incognita* (race 1), three as *M. incognita* (race 2), and five as *M. arenaria* (race 2). Contrary to the quantitative characters used to study nematode morphology, the qualitative characters i.e. perineal pattern, were species-specific and applicable for routine RKN diagnosis. The cytogenetical studies indicated that the populations of *M. incognita*race 1, *M. incognita* race 2, and *M. javanica* were considered hypotriploid, while the *M. arenaria* populations were considered triploid. The chromosomal numbers suggested that the mode of reproduction for the three species was mitotic parthenogenesis. Two assays of DNA fingerprinting viz., sequence characterized amplified regions (SCAR) and random amplified polymorphic DNA (RAPD) based polymerase chain reaction (PCR) assays were used. For SCAR-PCR, primers of 18-23 bases were used. Typical DNA products of 670, 420, or 1200 bp in size were amplified when extracted DNA of *M. javanica, M. arenaria* (race 2), or *M. incognita* (race 1 or 2), respectively, were used as template DNA. Using RAPD-PCR primer PA-01 had produced DNA patterns with bands that clearly distinguished the three *Meloidogyne* species but did not differentiate between the physiological races (1 and 2) of *M. incognita.* Accordingly, *Meloidogyne* species in Jordan could be most reliably identified using SCAR based PCR assay while races 1 and 2 *M. incognita*could only be differentiated using the NC differential host test despite it is dependent on the availability of the differential plant seeds and is time-consuming.