

Physiological, genetic, and pathogenetic variability in *Macrophomina phaseolina*, the causal agent of charcoal rot

De los Santos, B., Aguado, A., and Aparicio Durán, L.

Plant Pathology / IFAPA-CAPDER, Dirección Centro IFAPA Las Torres-Tomejil,
Ctra. Sevilla – Cazalla de la Sierra km 12,2 (Alcalá del Río, Sevilla, Spain) .



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DEGWE

ABSTRACT

Motivation: *Macrophomina phaseolina* (Tassi) Goidanich is a primarily soilborne pathogen with a wide distribution, varied host range, great longevity and high competitive saprophytic ability (Babu *et al.*, 2010). About 500 plant diseases are caused by this fungus (Su *et al.*, 2001), and it is often termed 'charcoal rot'. Charcoal rot has emerged as an important disease in strawberry production systems that have abandoned soil fumigation with methyl bromide (Mertely *et al.*, 2005; Zveibil and Freeman, 2005; Aviles *et al.*, 2008). Although, only one species (*M. phaseolina*) is recognized within the genus *Macrophomina* (Sutton, 1980), the high levels of morphological variability of *M. phaseolina* across different hosts and geographical regions suggest that this species may be divided into subgroups (Aboshosha *et al.*, 2007; Beas-Fernández *et al.*, 2006; Hawatema y Hameed, 2006; Karunanithi *et al.*, 1999; Mayek-Pérez *et al.*, 1997; Mihail y Taylor, 1995; Omar *et al.*, 2007). This work aimed to study the population structure of *M. phaseolina* associated with strawberry crop in Huelva, and to characterize the isolates with respect to *in vitro* growth rate, genotypic variability, and pathogenicity to strawberry plants.

Methods and results: Twenty two isolates of *M. phaseolina* from strawberry, blueberry, watermelon and rice are tested in this work. The morphological characteristics of the isolates are investigated, including colony phenotype on medium containing 120 mM potassium chlorate (Pearson *et al.*, 1986), and relative growth rate at different temperatures and pH (Beas-Fernandez *et al.*, 2006; Mayek-Perez *et al.*, 1997). Pathogenicity test are carried out under controlled conditions. Mono-sclerotic cultures of the fungus were obtained for molecular characterization.

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