

The Antagonistic Effect of *Coniothyrium minitans* Campbell, Against Some Sclerotial Pathogenic Fungi Using Scanning Electron Microscopy

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Wafaa M. E. Haggag

Plant Pathology Department, National Research Centre,
Giza, Dokki, Egypt

ABSTRACT

The parasitism of *Coniothyrium minitans* Campbell on the sclerotia-forming soilborne fungi, i. e. *Sclerotinia sclerotiorum*, *Macrophomina phaseolina*, *Sclerotium rolfsii*, *Rhizoctonia solani* and *Botrytis cinerea* was studied by scanning electron microscopy (SEM). The properties of the antagonism were revealed by microscopic examination of the fungi on Potato Dextrose Agar medium (PDA). The growth of the different pathogens was inhibited when contacted with the antagonist. The phenomena of inhibition included host hyphal alternation of lysed sites or extension, attached to the host either by hyphal coils, hooks, or formation of barriers, penetration of host hyphae and growth of *C. minitans* on the different host pathogens were observed by scanning electron microscopy.

Keywords: *Coniothyrium minitans*, sclerotia, soilborne fungi, antagonism, scanning electron microscopy.

INTRODUCTION

Coniothyrium minitans Campbell is active as a hyperparasite (McQuilken and Whipps, 1995; Whipps, 1997). The antagonistic properties of *C. minitans* and its ability to reduce the growth of other soilborne pathogenic fungi *in vitro* have been described by several authors (Adams, 1990; Whipps *et al.*, 1991; Whipps and Gerlagh, 1992; Sesan and Baicu, 1993; McQuilken *et al.*, 1997b). Successful biological control of soilborne fungi by infesting field with cultures of *C. minitans* has been described (McLaren *et al.*, 1996; McQuilken and Whipps, 1996). The ability of this antagonist to attack the

pathogenic fungi at different stages of their development has led to the concept that they could be powerful biocontrol agents (Trutmann *et al.*, 1980; Budge *et al.*, 1995; McQuilken *et al.*, 1995; McQuilken and Whipps, 1996). Several studies have reported the involvement of mycoparasites on fungi forming sclerotia such as *Sclerotinia* spp. (Whipps and Gerlagh, 1992; Budge *et al.*, 1995; Gerlagh *et al.*, 1996; McLaren *et al.*, 1996; McQuilken *et al.*, 1997a; Jones *et al.*, 1998; Williams *et al.*, 1998) and *Botrytis cinerea* (Sabet *et al.*, 1992; Gerlagh *et al.*, 1996). Antagonism between *C. minitans* and *Rhizoctonia solani* had been also reported (Sabet *et al.*, 1992). McQuilken *et al.* (1995) found that *C. minitans* inhibited colony growth