



Fig. 1. *Colletotrichum coccodes*; Tomato Brown Root Rot covered with black sclerotia (a); Acervuli with setae on the root (b); conidia (c); and appressoria (d). Photo credits H. Golzar.

Common Name: Black Dot

Disease: Tomato Brown Root Rot

Classification: K: Fungi, P: Ascomycota, C: Sordariomycetes, O: Phyllachorales, F: Phyllachoraceae

Colletotrichum coccodes (Wallr.) Hughes is an important pathogen of tomato and potato worldwide. The fungus is the causal agent of tomatoes anthracnose on the fruit, black dots on the roots and blemishes on the surface of potato tubers. It also causes early senescence (1). During summer 2009, symptoms were observed on root and stem bases of tomatoes in both field and glasshouse hydroponics systems at two Perth locations. Although *C. coccodes* has been previously reported on potato in Australia, this is the first report on tomato.

Symptoms and Impact:

Black Dot symptoms appear as brown lesions on the roots, progressing to larger brown areas covered with small black sclerotia (Fig 1a). The root cortex rots and abundant dark sclerotia form (diam. <1 mm). These symptoms are particularly evident on older roots where the tissues are grey to brown. Anthracnose symptoms appear on fruit as discolored lesions, and as the disease progresses, the lesions turn into large circular, sunken areas. Black sclerotia and acervuli may form on the fruit in moist conditions. Lack of vigor, premature senescence and necrosis of foliage can result in crop losses.

Fungal Characteristics:

C. coccodes is an anamorph of *Glomerella* which belongs to the Phyllachoraceae family. The fungus produces sparse, white to grey, aerial mycelium on potato dextrose agar and forms abundant dark sclerotia on agar surface. Acervuli and sclerotia form in culture and on the outer layer of infected roots. Conidia are cylindrical, hyaline and aseptate (16-25 µm x 3-4 µm) which form on cylindrical, phialidic conidiophores (Fig 1c). Acervuli on the roots are almost rounded (diam. 150-300 µm) with septate setae on

the surface (Fig 1b). Appressoria are ovate to elliptical (av. 12 x 7 µm) (Fig 1d).

Host Range:

The fungus occurs on tomato, potato and a wide range of plant species representing 13 families mostly from the Cucurbitaceae, Leguminosae and Solanaceae. Some asymptomatic hosts carry fungal propagules (1).

Fungal Survival:

Conidia and sclerotia of *C. coccodes* survive on tomato roots and infested soils. The sclerotia have been reported as a source of inoculum and can survive in the soil for up to 8 years (2).

Management and Control:

Good cultural and sanitation practices can reduce inoculum and disease dispersal. For example, crop rotation with non-host crops and elimination of wild hosts to reduce levels of inoculum and survival of the pathogen in the soil. Planting resistant cultivars is recommended, but known resistant cultivars are limited. Fungicide application is inefficient, however, soil fumigation in integrated disease control has been effective (3).

Further Reading:

- 1- Chesters & Hornby (1965a,b) *Trans. Br. mycol. Soc.* 48, 73–581, 583–594.
- 2- Dillard and Cobb (1998) *Plant Dis.* 82, 235-238.
- 3- Garibaldi *et al.* (2008) *Phytoparasitica.* 36, 483-488.

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