Nov 18

Pathogen of the month – Nov 2018

Sclerotinia minor (Jagger)

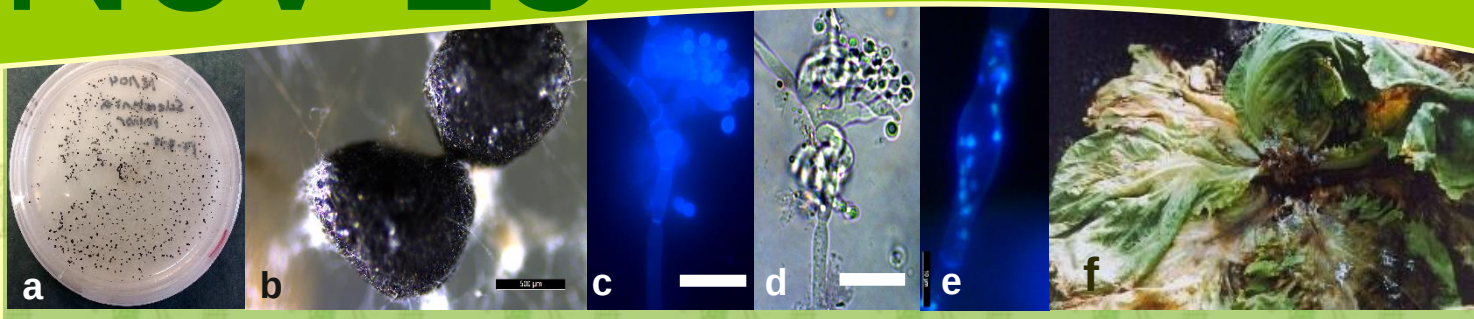

Fig. (a) *Sclerotinia minor* isolated from diseased lettuce on Corn Meal Agar (CMA) plate; (b) sclerotia with hyphae; (c) and (d) microconidia stained with calcofluor white under fluorescence and bright field microscopy respectively; (e) multinucleated vegetative hyphae stained with DAPI and; (f) brown soft decay with white mycelium on an 'Iceberg' lettuce. Scale bars represent in (b) 500 μm; (c) and (d) 20 μm and (e) 10 μm respectively. Fig. (f) kindly donated by Prof Ian Porter.

Common Name: *Sclerotinia minor*

Disease: Lettuce drop/ Sclerotinia

Classification: K: Fungi P: Ascomycota C: Leotiomycetes O: Heliotiales F: Sclerotiniaceae

Lettuce drop caused by the strictly soil borne pathogen, *Sclerotinia minor,* infects lettuce (*Lactuca sativa L.*) worldwide. It infects by mycelium from germinating sclerotia found near the base of the plant. It has the ability to cause disease in other crop plants such as tomatoes, soybeans and carrots. The closely related species, *S. sclerotiorum* (Lib.) de Bary can cause the same symptoms in lettuce.

Biology and Ecology:

Primary hyphae are 9-18 μm in diameter and contain dense granular contents. Hyphae are multinucleated and vary from two to more than a hundred per cell. About 90 % of the life cycle of *Sclerotinia* spp. is spent as black reproductive survival structures, sclerotia. In *S. minor,* they are 0.5-2 mm in diameter and irregular to roughly spherical in shape compared to *S. sclerotiorum* (2-20 mm long and 3-7 mm wide). Australian isolates of *S. minor* are capable of carpogenic germination, however there have been no records of apothecia in Australian fields. Soil temperature and moisture are critical factors that affect the sclerotial germination and survival of *S. minor*. Sclerotia can survive in soil for up to 11 years. Via eruptive germination of the sclerotia, the mycelium infects the lower leaves of the lettuce plants that are in contact with the soil. In symptomatic plants, the infected outer leaves wilt and a brown soft watery decay develops as the infection progresses destroying the whole plant. White mycelium mat forms to give rise to new sclerotes on the root, stem, and crown tissues of infected lettuce plants. The entire plant collapses hence known as lettuce drop.

Impact:

Over 7000 tonnes per hectare of lettuce are grown in Australia per year, making it Australia's 6th largest vegetable crop. In Victoria and Tasmania, losses from *S. minor* ranged from 10 to 45% despite the regular use of a fungicide spray program.

Distribution:

Lettuce drop occurs worldwide. Since 1896, *S. minor* has been known in Australia. It is problematic in southern cooler regions. Cool and wet weather favours disease development.

Host Range:

S. minor has more than 90 hosts. These include tomatoes, soybeans, peanuts, potatoes, sunflower and chickpeas.

Management options:

All commercial cultivars of lettuce are susceptible to both *S. minor* and *S. sclerotiorum*. Early prevention at the young lettuce seedling stage is important. Fungicides such as iprodione, procymidone, boscalid and fluazinam are used to control lettuce drop caused by *S. minor* immediately after thinning (at stages 4 to 5 true leaves). In Australia, iprodione is the only registered fungicide used to treat lettuce drop by the Australian Pesticides and Veterinary Medicines Authority (APVMA). Lettuce drop management usually involves integrating fungicide applications with several other control methods such as deep plowing and roguing of wilted plants, subsurface-drip irrigation and crop rotation with less susceptible crops or green manure biofumigant- producing Brassica crops. Contans®, based on *Coniothyrium minitans* biocontrol fungus is registered for use to control Sclerotinia in Europe and in USA. However, in Australia, field trials with other biocontrol agents were found to be ineffective.

Further Reading: Ekins *et al*. (2002) Australasian Plant Pathology 31:259-265; Grube (2004) Acta Hortic. 637, 49-55; Jagger IC (1920). J. Agric. Res. 20:331-333; Melzer MS *et al*. (1997) Canadian Journal of Plant Pathology, 19:3, 272-280; Subbarao (1998) Plant Disease 82 (10)1068-1078; Villalta *et al*. (2004) Final report (Horticulture Australia) ; VG00048; Willetts and Wong (1980) Botanical Review, 46 (2): 101-165

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