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MEDICINAL AND AROMATIC PLANT DECAY CAUSED BY *SCLEROTINIA SCLEROTIORUM* IN SERBIA

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INTRODUCTION

Sclerotinia sclerotiorum is a widespread, homothallic and necrotrophic, ascomycetous fungus (1). It is plurivorus fungus and is an important plant pathogen of over 400 species. Sclerotinia blight is a common disease of sunflower in Serbia. Recently (1999-2005), sudden wilt of marshmallow (*Althea officinalis*), valerian (*Valeriana officinalis*), nettle (*Urtica dioica*), and caraway (*Carum carvi*) was observed in the spring and summer. Diseased plants wilted and died before the end of vegetation season.

MATERIAL AND METHODS

Diseased plants of marsh mallow, valerian, nettle and caraway were collected during spring and summer from 1999 to 2005. From symptomatic stem sections the pathogen was isolated on PDA at 22°C. Pathogenicity of obtained isolates was confirmed by inoculating seedlings of marsh mallow, valerian, nettle and caraway, which were grown in pots in the greenhouse.

The inoculum was the mixture of homogenised mycelia and sclerotia in 100 ml of distilled water. The plants were kept three days in wet chamber and then transferred in a greenhouse.

Pathogen development and sclerotia formation were studied at potato dextrose agar (PDA), malt agar (MA), Sabourand dextrose agar (SDA) and water agar with fragments of carnation leaves (WCA). Effect of temperature on pathogen development "in vitro" was studied at 5- 30°C, with 5°C intervals.

Vitality of sclerotia (1-5 years age) were studied by incubation on wet filter paper at 4ºC for two to four months.

Identification of pathogen was done according morphological characteristic of asci and ascospores (2).

RESULTS AND DISCUSSION

Initial symptoms if the infection started through contaminated soil included stem necrosis atthe soil level (Fig. 1 a), yellowing and tan discoloration of leaves. The roots of such necroted (Fig. 1 b) and infected plants died. If infections were realised by ascospores water soaked were formed on the stems.

The diseased tissue become necroted and were covered with whitish cottony mycelia (Fig. 1 c, d). As stem necrosis progressed, infected plants wilted and died before the end of vegetation. On necrotic tissues dark, spherical to elongate spherical sclerotia, 2-8 mm diameter were produced.

a

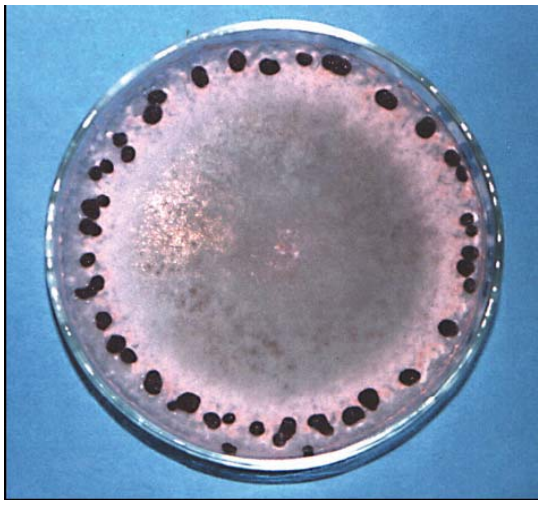
b

c

d

Fig. 1. *Sclerotinia sclerotiorum*. Symptoms of infection basal part (a) and necrosis of the root tissue of marshmallow (b), white mycelia with sclerotia formation of pathogen on the stems of marshmallow (c) and nettle (d).

On PDA colonies were white to pale grey with abundant dark brown to black sclerotia formed Fig. 2 a, b). Apothecia (Fig. 3 a) with characteristic asci and ascospores (Fig. 3 b) were formed from sclerotia after 2 month of incubation on wet filter paper at 4ºC. Sclerotia kept its viability for long time (over five years).



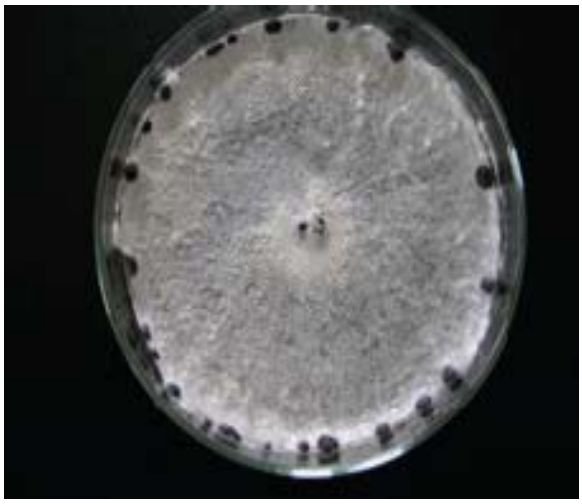


Fig. 2. *Sclerotinia sclerotiorum*. Culture appearance and sclerotia formation of isolate from caraway (left) and from valerian (right).

According to morphological characteristics of isolates obtained from symptomatic stem sections of marsh mallow, valerian, nettle and caraway pathogen was identified as *Sclerotinia sclerotiorum* (Lib). De Bary (2).

The best pathogen development *in vitro* and the most abundant sclerotia formation were at PDA. Pathogen grew well at all temperatures tested (5-30ºC) with optimum being at 20-25ºC.

Artificial inoculated plants showed similar symptoms, and characteristic mycelia and black sclerotia were formed within five and seven days, respectively. Control plants remained symptomless. The pathogen was reisolated from inoculated plants.

Sclerotinia sclerotiorum as plurivorous fungus has a wide host range (1, 2). It is generally more important as a pathogen of vegetables in the field, during transport and in store (2). This pathogen was described on some medicinal and aromatic plants such as common sage (3), *Thymus x citriodorus* (4), St. John's worth (5), coneflower (6). It has already described on marshmallow and valerian (7, 8) in Serbia, but here is reported for the first time as pathogen of nettle and caraway.

Fig. 3. *Sclerotinia sclerotiorum.* Germinating sclerotia which formed apothecia (left) and ascus with ascospores (right)

ABSTRACT

The marshmallow (Althea officinalis), valerian (Valeriana officinalis), nettle (Urtica dioica), and caraway (Carum carvi) are described as the hosts of Sclerotinia sclerotiorum in Serbia. The symptoms and morphological characteristics are described. Effect of temperature and media were investigated on pathogen development and sclerotia production.

CONCLUSION

- Sclerotinia blight is a common and very destructive disease on many growing plants.
- It was on marshmallow and valerian in Serbia, but for the first time on nettle and caraway.
- According to morphological characteristics pathogen was identified as *Sclerotinia sclerotiorum*.
- As pathogen's sclerotia survived for a long time in the soil it could be suggested to the farmers not to grow medicinal and aromatic plants on the fields where previous crops were sensitive plants, such as sunflower.

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