

Occurrence of *Sclerotinia sclerotiorum* (Lib) de Bary and *Diaporthe (Phomopsis) helianthi* Munt.-Cvet. et al. on *Iva xanthiifolia* Nutt. in Slovak Republic

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Abstract

HUSZÁR J. (2011): **Occurrence of *Sclerotinia sclerotiorum* (Lib) de Bary and *Diaporthe (Phomopsis) helianthi* Munt.-Cvet. et al. on *Iva xanthiifolia* Nutt. in Slovak Republic.** Plant Protect Sci., **47**: 52–54.

The polyphagous pathogen *Sclerotinia sclerotiorum* (Lib) de Bary causes significant diseases of sunflower and oil-seed rape while Diaporthe wilt, invoked by the pathogen *Diaporthe (Phomopsis) helianthi* Munt-Cvet. et al., is another important disease of sunflower in Slovakia. Since 2001 we have identified *S. sclerotiorum* on *Iva xanthiifolia* Nutt. in three locations and the infestation of *I. xanthiifolia* by *D. helianthi* has been observed only in one location of western Slovakia. The infestation of *I. xanthiifolia* by *Sclerotinia* disease and by *D. helianthi* has been observed only after secondary ascospore infection in sunflower fields.

Keywords: *Sclerotinia sclerotiorum*; *Diaporthe (Phomopsis) helianthi*; *Iva xanthiifolia*; *Helianthus annuus*

Sclerotinia wilt and white mould, caused by the polyphagous pathogen *Sclerotinia sclerotiorum* (Lib.) de Bary, are significant diseases of sunflower and oil-seed rape in Slovakia. More than 400 plants are known as *S. sclerotiorum* hosts, mostly dicotyledons, classified into 64 families and 225 genera. Diaporthe wilt, invoked by the pathogen *Diaporthe helianthi* Munt-Cvet. et al. (anamorph: *Phomopsis helianthi* Munt-Cvet. et al.), is another important disease of sunflower (HUSZÁR *et al.* 2007). The quarantine expansive weed *Iva xanthiifolia* Nutt. is one of the host plants for both pathogens.

Since 2001 *S. sclerotiorum* has been identified on *I. xanthiifolia* in three locations of western Slovakia (Nýrovce, Kalná nad Hronom and Veľký Cetín). We always detected the infestation of *I. xanthiifolia* by *Sclerotinia* disease in sunflower fields. *S. sclerotiorum* is a cosmopolite pathogen from the aspect of geographic distribution. *S. sclerotiorum* was primarily considered as the pathogen of colder and humid regions, but some occurrences were also detected in dry and warmer regions.

The genetic variability of *S. sclerotiorum* isolated from various host plants originating from Slovakia (*Helianthus annuus* L. – Nýrovce, *I. xanthiifolia* – Veľký Cetín, *Conium maculatum* L. – Veľký Kamenec) and from Algeria (*Phaseolus vulgaris* L., *Lycopersicon esculentum* L. and *Lactuca sativa* L.) was compared by PCR-based mini- and microsatellite analyses (ARBAOUI *et al.* 2008). Variations in DNA banding patterns did not confirm the expected separation between geographically distant isolates. Genetic similarity of isolates was higher within host plants originating from different agro-climatic conditions.

An isolate from *P. vulgaris* and an isolate from *H. annuus* were the most similar. There is no taxonomical relatedness of host plants from which those isolates were collected. The reason for the common branching of an isolate from *L. sativa* and isolates from *I. xanthiifolia* could be the botanical similarity of the host plants from which these two strains were isolated.

The infestation of *I. xanthiifolia* by *D. helianthi* was observed only in the location of Mojmirovce in



Figure 1. *Iva xanthiifolia* in the stage of elongation growth

the field of the sunflower hybrid Arena. Harmfulness of *D. helianthi* on sunflowers is more remarkable in the Balkans (former Yugoslavia, Bulgaria, Romania). The pathogen *D. helianthi* was recorded in Hungary, France, Ukraine, Czech Republic, Slovak Republic and in the USA as well. The oc-



Figure 3. Breakage symptoms on a sunflower stem after a strong attack by *Diaporthe (Phomopsis) helianthi*



Figure 2. Destruction of the *Iva xanthiifolia* stem after infection by *Sclerotinia sclerotiorum* (with a high production of sclerotia)

currence of *D. helianthi* on *I. xanthiifolia* was first documented in Bulgaria (ENCHEVA 2006).

I. xanthiifolia originates from the continental part of North America. It spread out onto the European continent in the 20th century. There were occurrences in Asia (Caucasus), Far East and even in Australia. The first official report on the occurrence of *I. xanthiifolia* in Slovakia is dated to 1958. The mass occurrence on arable land in the regions of southern Slovakia is dated 20 to 25 years ago. The first report on the occurrence of *I. xanthiifolia* in the Czech Republic dates back to 1951. The *I. xanthiifolia* in conditions of the Czech and Slovak Republic was described in more details by JEHLÍK (1998).



Figure 4. Symptoms of the attack by *Diaporthe (Phomopsis) helianthi* on the *Iva xanthiifolia* stem (with a high production of pycnidia, Mojmírovce locality)

According to our observations *I. xanthiifolia* is a very plastic plant, with a good competitive ability. It flourishes in poorer locations along roads, abuttals, on plough-land (mostly at the margins of arable crops), and also on field dunghills which are very rich in nutrients. It can establish local monocultures in uncultivated fields. *I. xanthiifolia* is quite a frequent weed in root crops, legumes and in sparse cereals in the southern parts of Slovakia. The occurrence of *I. xanthiifolia* in crops which are non-hosts of *S. sclerotiorum* and *D. helianthi* could be a source of the inoculum of these pathogens and higher attack of future sunflower crops.

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