

# Alien Diseases of Woody Plants in the Czech Republic

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## Abstract

In this contribution, we evaluate the present situation regarding alien diseases of woody plants in the Czech Republic. Of some 28 alien diseases, four have statutory quarantine organism status under European and Mediterranean Plant Protection Organisation (EPPO) and European legislation. These are Chestnut blight *Cryphonectria parasitica*, Dothistroma needle blight *Dothistroma septospora* (G. Doroguine) Morelet, Brown spot needle blight *Lecanosticta acicola* (Thümen) H. Sydow, and Fire blight *Erwinia amylovora*. The powdery mildews are a significant group of pathogens that are presently spreading. Newly recognised in recent years, for example, are *Erysiphe azaleae*, *E. elevata*, *E. flexuosa* and *E. carpinicola* (Hara) U. Braun & S. Takam, and others.

**Keywords:** Alien diseases, *Cryphonectria parasitica*, *Dothistroma septospora*, *Lecanosticta acicola*, powdery mildew

## Kurzfassung

### Fremdländische Krankheiten an Holzgewächsen in der Tschechischen Republik

In diesem Beitrag bewerten wir die derzeitige Situation hinsichtlich fremdländischer Krankheiten an Holzgewächsen in der Tschechischen Republik. Von 28 fremdländischen Krankheiten werden vier nach den Bestimmungen der Europäischen und Mediterranen Pflanzenschutz-Organisation (engl. Abkürzung: EPPO) und der Europäischen Union als Quarantäne-Organismus eingestuft. Dabei handelt es sich um den Edelkastanien-Rindenkrebs *Cryphonectria parasitica*, Dothistroma-Nadelbräune *Dothistroma septospora* (G. Doroguine) Morelet, Lecanosticta-Nadelbräune *Lecanosticta acicola* (Thümen) H. Sydow, und den Feuerbrand *Erwinia amylovora*. Mehltau-Pilze gehören zu einer Gruppe von Krankheitserregern, die sich derzeit ausbreiten. In den letzten Jahren konnten zum Beispiel *Erysiphe azaleae*, *E. elevata*, *E. flexuosa* und *E. carpinicola* (Hara) U. Braun & S. Takam neu beobachtet werden.

**Schlüsselworte:** Fremdländische Krankheiten, *Cryphonectria parasitica*, *Dothistroma septospora*, *Lecanosticta acicola*, Mehltau

Alien diseases of woody plants represent a serious phytosanitary risk to forest stands, solitary trees and plantations of ornamental woody species. Many such alien diseases found in the past can now be regarded as naturalised. Examples include Dutch elm disease *Ophio-*

*stoma ulmi* (Buism.) Nannf. and powdery mildew *Microsphaera alphitoides* Griff., as well as the more recently introduced Dothistroma needle blight *Dothistroma septospora* (G. Doroguine) Morelet and others.

A survey of alien diseases confirmed that around 28 species occur in the Czech Republic (CR), including four quarantine diseases. The quarantine diseases, with the exception of fire blight caused by *Erwinia amylovora*, have all been found in the last ten years. These are chestnut blight *Cryphonectria parasitica* (Murril) M.E. Barr, Dothistroma needle blight, and brown spot needle blight *Lecanosticta acicola* (Thümen) H. Sydow.

Dutch elm disease, which was first reported in the CR in Poděbrady and Prague in 1932, is by all its consequences a typical alien disease. A mass decline in elms in the 1960s and 70s is associated with *O. novo-ulmi* Brasier (Brasier 1991). It was confirmed in the CR by Dvořák et al. (2007), the predominant subspecies being *O. novo-ulmi* ssp. *novo-ulmi*. Also noted was *O. novo-ulmi* ssp. *americana*, together with hybrids, which has been recorded in Austria too (Konrad et al. 2002).

Douglas-fir needle blight *Rhabdocline pseudotsugae* Syd., first detected in Western Bohemia in 1938, is now a naturalised type. In some areas, needle blight wholly limits the cultivation of susceptible varieties and those of Douglas origin, especially *Pseudotsuga menziesii* var. *caesia* and var. *glauca*.

Swiss needle cast *Phaeocryptopus gaeumannii* (Rohde) Petr. was recorded for the first time in Central and Southern Bohemia in 2002 (Pešková 2003), and in Southern Moravia and around Brno in 2003. At present, the ongoing spread of needle blight among Douglas-fir throughout the CR is causing concern.

Chestnut blight *Cryphonectria parasitica* (Murril) M. E. Barr. (Figure 1) was recorded in the former Czechoslovakia in 1976 at Prašice - Duchonka by Topľčany in Slovakia (Juhásová & Bernadovičová 2001). It was confirmed in the CR in 2002 (Jankovský et al. 2004b). At present, it is known from six localities. At each locality it has been detected on another vegetatively compatible group. Chestnut blight was also confirmed on red oak *Quercus rubra* (Haltofová et al. 2005). Although the situation is stabilised at present, following eradication at all localities, this disease still requires continuous quarantine control. At present, the CR has the status of a protected zone in accordance with EU directives.



Figure 1: *Cryphonectria parasitica* - typical symptoms: necroses and fruiting bodies, Těšany u Brna, March 2005  
 Abbildung 1: *Cryphonectria parasitica* - typische Symptome: Nekrosen und Fruchtkörper, Těšany bei Brünn, März 2005

Dothistroma needle blight *Dothistroma septospora* (G. Dorogouine) Morelet (teleomorph *Mycosphaerella pini* E. Rostrup) was recorded in the CR for the first time in 1999. It was detected on Austrian Pine *Pinus nigra* ssp. *austriaca* originating from Hungary during control of imported plant material by the State Phytosanitary Administration. The first finding of *D. septospora* in the CR was in May 2000 on a plantation of



Figure 2: *Dothistroma septospora* on *Pinus silvestris*, Southern Bohemia, March 2008  
 Abbildung 2: *Dothistroma septospora* an Weißkiefer, Südböhmen, März 2008



Figure 3: *Lecanosticta acicola* on *Pinus rotundata*, Soběslavská blata, Southern Bohemia, August 2008  
 Abbildung 3: *Lecanosticta acicola* an Moor-Spirke, Soběslavská blata, Südböhmen, August 2008

Christmas trees *P. nigra* at Jedovnice near Brno (Jankovský et al. 2004a). To date, it has been detected on 20 species of pine (Figure 2), four species of spruce and on Douglas firs (Bednářová et al. 2007). It is very common across the CR.

Brown spot needle blight *Lecanosticta acicola* (Thümen) H. Sydow, (teleomorph *Mycosphaerella dearnessii* M.E. Barr) was identified on a specimen of bog pine *P. rotundata* (Figure 3) from Southern Bohemia in July 2007 (Jankovský et al. 2008). This significant phytopathological problem is complicated by the specimen's origin in a national nature reserve. Current eradication procedures cannot be used in this locality. This is the only confirmed finding so far, and both the spread of the disease in this region and its potential for spreading to Scots pine *P. sylvestris* remain unclear.

Alder dieback *Phytophthora alni* C. Brasier & S.A. Kirk was confirmed in the CR by Černý et al. (2003). It mostly affects Southern Bohemia, though alder dieback is widespread throughout the CR. The origin of sudden oak death, *Phytophthora ramorum*, was not proven to be oaks in the CR, despite being recorded on *Viburnum bodnantense* by the State Phytosanitary Administration (Běhalová 2006).

The largest number of newly discovered alien pathogens comes from the powdery mildew group *Erysiphales*. Palovčíková et al. (2007) identified 27 species of powdery mildew on woody plants. Of these, a minimum of seven can be termed alien. Examples include *Erysiphe azaleae* (U. Braun) U. Braun & S. Takam. on *Rhododendron* spp., *E. elevata* Burrill. on *Catalpa* spp., *E. flexuosa* (Peck) U. Braun & S. Takam. on *Aesculus* spp., *E. carpinicola* (Hara) U. Braun & S. Takam. on *Carpinus betulus*, and others (Lebeda et al. 2007a, 2007b; Palovčíková et al. 2007).



Figure 4: Ash decline – necroses on bark caused by *Chalara fraxinea*, Beskydy Mts., July 2008

Abbildung 4: Eschentriebsterben: Rindennekrose verursacht durch *Chalara fraxinea*, Beskiden Juli 2008

The cause of ash dieback, *Chalara fraxinea* Kowalski (Kowalski 2006), was confirmed in October of 2007 in the arboretum at Krtiny near Brno (O. Holdenrieder, oral comm.). Ash dieback symptoms (Figure 4) were observed in the CR from the mid-1990s, and increasingly from 2004. The deteriorating health of ash is associated with unfavourable climatic extremes and debatably with sucking insects as one of the stress factors, or as vectors.

*Melampsora hirsutukanum* (Müller 2003) is an alien rust fungus of alder. In certain years, at some localities, it has reached epidemic levels.

During the 20th century, a succession of diseases was introduced into the CR. The main causes were social and economic changes, and changing natural conditions within the European countryside. A great acceleration in the spread of new disease species in the CR was brought about by the opening of borders and trade after 1990. To what degree the appearance of new pathogen species since the 1990s is due to societal change, concurrent climatic extremes, or more intensive research, however, remains unclear.

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