

Phytophthora on Sweet chestnut, Alder, European beech and Norway spruce in Slovakia

Investigations realized in the Centre of Excellence for Biological Control of Forest Pests situated in Banská Štiavnica

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Phytophthora species are primary soil pathogens with a high pathogenicity against host plants. *Phytophthora* spp. can be the main cause of progressive destruction of fine roots but pathogens infect also bark and collar and are able to induce thyloses in large xylem vessels thus reducing their conductivity for water and nutrients.

Phytophthora cambivora (Petri) Buisman and *Phytophthora cinnamomi* Rands play a significant role in all areas of *Castanea sativa* Mill. plantations as a fruiting or a woody plant species in Slovakia. *Phytophthora cactorum* (Lebert & Cohn) J. Schröt. is still very common in forest nurseries on European beech seedlings as well as on other tree species such as Norway spruce seedlings.

Sweet chestnut *Castanea sativa* Mill.

Although *Castanea sativa* Mill. is an introduced tree species in Slovakia, it is well adapted to natural conditions of the country. There are 1500 ha of chestnut forests in Slovakia. Some very old forest stands still exist. For instance, the chestnut primeval forest in Jelenec is 100 years old and the forest stands in Modrý Kameň, Limbach and Modra are about 50 years old.

The first foci of *Phytophthora* infection was noticed in 1972 at Žemberovce. According to an inventory of health conditions, ink disease caused by *Phytophthora* is less harmful than chestnut blight caused by *Cryphonectria parasitica*. *Phytophthora* fungi primarily damage chestnut trees on sites with unsuitable growing conditions (waterlogged or with heavy clay soils) where trees are planted close together. Usually only young trees are affected, in Modrý Kameň occasionally also trees 80 to 150 years old. *Phytophthora* spp. was present and isolated from *Castanea sativa* in nine localities in Slovakia. At eight sites the trees were younger than 30 years (JUHÁSOVÁ 1999).

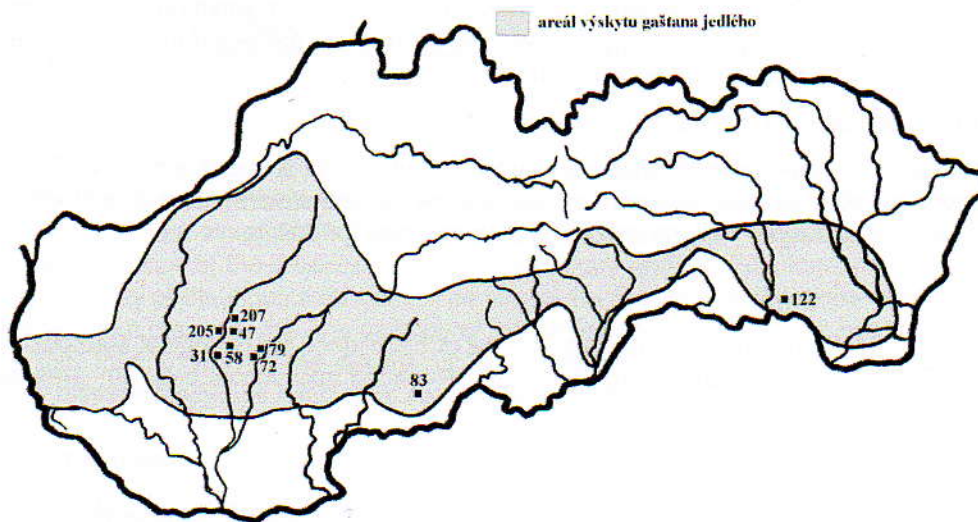


Figure 4: Nine *Castanea sativa* localities infected with *Phytophthora cambivora* or *Phytophthora cinnamomi* by 2001 (31 – Nitra, 47 – Horné Lefantovce, 58 – Arborétum Mlyňany, 72 – Žemberovce, 79 – Tlstý Vrch, 83 – Modrý Kameň, 122 – Slanec, 205 – Nitrianska Streda, 207 – Krnča)

Table 1: Description of localities where *Phytophthora* sp. was found

Locality	No. in the map	Latitude	Longitude	<i>Phytophthora</i> sp.
Tlstý Vrch	79	48°16'37"N	18°49'93"E	<i>Ph. cambivora</i>
Krnča	207	48°17'42"N	18°16'20"E	<i>Ph. Cambivora</i> <i>Ph. cinnamomi</i>
Nitrianska Streda	205	48°30'62"N	18°12'28"E	<i>Ph. Cambivora</i> <i>Ph. cinnamomi</i>
Žemberovce	72	48°17'42"N	18°48'12"E	<i>Ph. Cambivora</i> <i>Ph. cinnamomi</i>
Modrý Kameň	83	48°14'58"N	19°19'89"E	<i>Ph. cambivora</i>
Nitra	31	48°18'02"N	18°04'56"E	<i>Ph. cambivora</i>
Arborétum Mlyňany	58	48°19'59"N	18°22'59"E	<i>Ph. cambivora</i>
Slanec	122	48°38'03"N	21°28'69"E	<i>Ph. cambivora</i>
Horné Lefantovce – lesný porast	47	48°25'42"N	18°10'43"E	<i>Ph. Cambivora</i> <i>Ph. cinnamomi</i>
Horné Lefantovce – experim. plocha	47	48°25'42"N	18°10'43"E	<i>Ph. Cambivora</i> <i>Ph. cinnamomi</i>

Alder *Alnus glutinosa* (L.) Gaertn.

There is an evidence of infected alder *Alnus glutinosa* in Central Slovakia near the village Malužiná. The first finding of *Phytophthora alni* subsp. *multiformis* Brasier & S.A. Kirk was proved in 2005 (KUNCA *et al.* 2007).

We have not found older beech trees with symptoms leading to *Phytophthora* infection in Slovak forests (HARTMANN *et al.* 2005). However, it is very common to find *Phytophthora* sp. on beech seedlings. These are severely affected mostly after long term rains, damaged irrigation system or on sites with high level of groundwater (KUNCA, LEONTOVYČ 2005).

Norway spruce *Picea abies* (L.) Karst.

Picea abies seedlings were damaged after over logged seedbeds in forest nurseries in 2010. Heavy rains lasting from mid April at least through the end of June caused severe dieback of Norway spruce seedlings. Isolation of pathogen was done from oak leaves used for baiting

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