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The occurrence of some pests and diseases on horse chestnut, plane tree and Indian bean tree in urban areas of Slovenia

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ABSTRACT

The occurrence of some pests and diseases was monitored on horse chestnut (*Aesculus hippocastanum*), red horse chestnut (*Aesculus x carnea*), plane tree (*Platanus hybrida*) and Indian bean tree (*Catalpa bignonioides*) in the period 1995-2003. The following organisms were the most common: the horse chestnut leaf-miner (*Cameraria ohridella*) on horse chestnut and, in recent two years, also on red horse chestnut, the Sycamore lace bug (*Corythuca ciliata*) and the leaf miner (*Phyllonorycter platani*) on plane tree. The flatid planthopper (*Metcalpha pruinosa*) was found inland, in Ljubljana in 2003 on *A. x carnea* near a busy petrol station, and on *C. bignonioides* in the vicinity of a motorway intersection. Along with *M. pruinosa*, two new parasite fungi for Slovenia were found in 2003 *Erysiphe flexuosa* on *A. x carnea*, *A. hippocastanum* and *Erysiphe elevata* on *C. bignonioides*.

Key words: Horse chestnut (*Aesculus hippocastanum*, *A.x carnea*), plane tree (*Platanus hybrida*), Indian bean tree (*Catalpa bignonioides*), pests, diseases

IZVLEČEK

NAVZOČNOST NEKATERIH ŠKODLJIVCEV IN BOLEZNI NA DIVJEM KOSTANJU, JAVOROLISTNI PLATANI IN NAVADNEM CIGARARJU V URBANEM PROSTORU V SLOVENIJI

Spremljali smo pojavljanje nekaterih škodljivih organizmov v urbanem prostoru na navadnem divjem kostanju (*Aesculus hippocastanum*), rdečecvetnem kostanju (*Aesculus x carnea*), javorolistni platani (*Platanus x hybrida*) in navadnem cigararju (*Catalpa bignonioides*) v letih 1995-2003.

Pojavljali so se: kostanjev listni zavrtač (*Cameraria ohridella*) na navadnem divjem kostanju in zadnji dve leti na rdečecvetnem, čipkarka (*Corythuca ciliata*) in platanin listni zavrtač (*Phyllonorycter platani*) na javorolistni platani. Medeči škržatek (*Metcalpha pruinosa*) je zabeležen v letu 2003 v Ljubljani na *A. x carnea* blizu prometne bencinske črpalke in na *C. bignonioides* v Ljubljani. Skupaj z vrsto *M. pruinosa* smo v letu 2003 prvič na ozemlju Slovenije ugotovili pepelovko *Erysiphe flexuosa* na kostanju *A. carnea*, *A. hippocastanum* in pepelovko *Erysiphe elevata* na cigararju *C. bignonioides*.

Ključne besede: Divji kostanj (*Aesculus hippocastanum*, *A.x carnea*), platana (*Platanus hybrida*), navadni cigarar (*Catalpa bignonioides*), škodljivci, bolezni

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1. INTRODUCTION

The horse chestnut (*Aesculus hippocastanum*) and the plane tree (*Platanus hybrida*) are tree species which are common in urban areas of Slovenia. The Indian bean tree (*Catalpa bignonioides*) too is found in towns in particular. The first tree species occur along highways leading into a town or a city and in tree-lined avenues. They also grow in town squares and parks. Horse chestnuts are often present near churches and in cemeteries, pub gardens, and private gardens. Indian beans grow as solitary trees or in sparsely planted small groups. They are ornamental trees offering protection against the noise and giving shade in hot summer months. In the past they flourished mainly because they were not exposed to highly aggressive pests. The present study discusses some pests and new diseases that were observed in trees present in locations adversely affected by heavy traffic.

2. MATERIALS AND METHODS

In the period 1995-2003, leaves of selected trees of *Aesculus hippocastanum* and *A.x. carnea*, *Platanus hybrida* and *Catalpa bignonioides* were monitored for the presence of pests and some rare diseases. The study was mainly conducted in busy locations (in Ljubljana, Novo mesto, Maribor, Ormož) such as parking lots, tree-lined avenues, petrol stations, and cemeteries. Infested leaves were collected from May to October and checked visually on the pests. In the laboratory the specimens were carefully examined under a stereomicroscope to determine the species of organisms occurring on the leaves. Under a light microscope the microorganisms were determined using standard phytopathological methods and data from the literature (Braun, 1987, 1995; 1997; Vajna, Fischl, Kiss, 2004). Organisms found on the trees in urban areas are presented in the results of the investigation.

3. RESULTS AND DISCUSSION

Cameraria ohridella Deschka et Dimić

The first mention of the species *C. ohridella* in Slovenia was made in 1995, when it was already present in considerable numbers in an avenue lined with horse chestnuts in Novo mesto (Milevoj, Maček, 1997). Moths were probably introduced into Slovenia a year or so earlier. Under the trees cars were parked. Adult subjects were found in cars parked there. In 1996, when *C. ohridella* became a major pest in this location, it was also observed in Maribor, Ormož and Ljubljana. In 1997 it was already present almost all over Slovenia, and by the following year it was spread throughout the country. The study found that three generations develop in Ljubljana on *A. hippocastanum*. The presence of the insect pest on *A. x carnea* was observed in 2002. When the larvae L1 penetrated a leaf of *A.x carnea*, they caused an injury of about two millimetres in size and died.

Corythuca ciliata Say

The presence of the species *Corythuca ciliata* was first observed in Slovenia in 1975 (Gogala, 1981/82). No exact data are known about its subsequent spreading in the country. The damages were strong in the 1980's. The presence of the insect was observed in all four locations from June to October in the period 1995 – 2003. Today the species is widely spread on plane trees throughout the country but the intensity of infestations of *C. ciliata* has decreased due to natural enemies.

***Phyllonorycter platani* Standiger**

The presence of the insect was observed in all four locations during period 1995 – 2003. In 1971 Maček reported the presence of the leaf miner (*Phyllonorycter platani*) on a plane tree. Since then, it has spread on plane trees throughout Slovenia. It develops over two generations. Moths of the first generation, which hatch out in May and June, deposit eggs mainly on the lower part of a tree crown, while moths of the second generation, which emerge from July to the end of August, lay eggs on leaves in higher parts of the crown. This pest too is transmitted by vehicles that park under the trees. Because it is in competition with the Sycamore lace bug as regards diet, the leaf miner causes, as a rule, less damage.

***Metcalpha pruinosa* Say**

In Europe the species was first reported from the environs of Treviso, Italy, back in 1979. This polyphagous species was first observed in Slovenia in 1991, in the vicinity of Koper (Šivic, 1991). Since then, it has been found in several other European countries. In 1996 individual specimens, along with the species *Cameraria ohridella*, were observed on *A. hippocastanum* in Novo mesto. In the course of this study it was found in July 2003 in the centre of Ljubljana, near a petrol station on *A.x carnea* and on *C. bignonioides*, quite close to the southern motorway intersection.

Powdery mildew *Erysiphe flexuosa* (Peck) U. Braun & S. Takamatsu

From August to October 2003, powdery mildew, along with the insect *M. pruinosa*, was observed on the leaves of *A.x carnea* near a petrol station in the centre of Ljubljana, and in another location some kilometres away on the leaves *A. hippocastanum*, under which cars are parked. A standard microscopic analysis of cleistothecia, measurement of size (120-160 µm), shape of appendages, the curve of which resembles that of a walking stick, number of asci (3-5) and number of ascospores (6-8), which are round and single-celled, as well as data from literature (Braun, 1987), all of these were used to determine the fungus *Erysiphe flexuosa*, originating in north America. In Germany it was discovered as early as 1999 (Butin, Kehr, 2002). Reports on the appearance of *Erysiphe flexuosa* on horse chestnut (*Aesculus hippocastanum*) is also from Hungary (Kiss et al., 2004).

Its presence has been reported from several European countries. Its hosts belong to about five different species of horse chestnut (Butin, Kehr, 2002, Zimmermanova-Pastirčakova, Pastirčak, 2002). The original name of the fungus was *Uncinula flexuosa* Peck. On the basis of molecular studies, it was then classified into the genus *Erysiphe* (Braun, Takamatsu, 2000 cit. Butin, Kehr, 2002). If plants are infested with the fungus, the disease affects their appearance. Thus, in August and September, the author observed a superficial greyish-white growth on the upper part of the leaves as well as cleistothecia, visible to the unaided eye.

Powdery mildew *Erysiphe elevata* (Burill) U. Braun & S. Takamatsu

From July to October 2003, another species of powdery mildew, along with *M. pruinosa*, was found on the leaves of *C. bignonioides* in several busy locations on The Indian Bean Tree in Ljubljana. White mycelia covered the *Catalpa* leaves. Conidia

measured 20-35x8-15µm. Cleistothecia varying from 85 to 120µm in size, with five to nine appendages. The appendages terminated in dichotomously branched, knob-like or slightly recurved tips. They were 110-400µm long. The cleistothecia contained up to 7 asci. Microscopic analysis and data from the literature were used to determine the fungus *Erysiphe elevata* (Burill) U. Braun & S.Takamatsu. The disease leads to desiccation of the leaves and early leaf fall in September. *Erysiphe elevata* (syn. *Microsphaera elevata*) is a common powdery mildew species infecting *Catalpa* spp. trees in North America (Braun, 1987). First report on the appearance of *Erysiphe elevata* on *C. bignonioides* in Europe is from Hungary (Vajna et al., 2004).

4. CONCLUSIONS

The studies were aimed at obtaining knowledge about the occurrence and spread of some pest and diseases on the leaves of *Aesculus hippocastanum*, *A.x carnea*, *Platanus hybrida* and *Catalpa bignonioides* in four locations in Slovenia. On *Aesculus hippocastanum* was found: *Cameraria ohridella*, *Metcalpha pruinosa* and *Erysiphe flexuosa*; on *A. x carnea* *C. ohridella*, *M. pruinosa* and *E. flexuosa*; on *Platanus hybrida* *Corythuca ciliata*, *Phyllonorycter platani*; on *Catalpa bignonioides* *M. pruinosa* and *Erysiphe elevata*.

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