

ALIAN INSECT PESTS ON INTRODUCED WOODY PLANTS IN SLOVAKIA

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ABSTRACT: Resistance of woody plants to pests and diseases is one of the basic indicators of their successful introduction. In recent years, there are records of occurrence and damaging activity of new insect pests on introduced woody plants. The presence of insect pests in Slovakia has increased mainly due to arrivals from warmer European zones and other countries.

The present paper treats the following species: *Cameraria ohridella*, *Corythuca ciliate*, *Phyllonorycter platani*, *Parectopa robinella*, *Phyllonorycter robinellus*, *Dasyneura gleditschiae*, *Coleotechnites piceaella*, *Argyresthia thujella*, and *Hyphantria cunea*. The bionomy of insect pests and damage symptoms on introduced woody plants in Slovakia are briefly described in the paper.

KEY WORDS: insect pests, introduced woody plant species

INTRODUCTION

During the last years, the fear of possible accidental introduction of allochthonous plant and animal pests is increasing in Europe. Despite international cooperation in the control of quarantine pests since founding of the European Plant Protection Organization, that possibility still exists. Knowingly or accidentally introduced species may behave in a new environment unexpectedly because of the absence of native predators and changed conditions.

The simultaneous action of drought, late frosts, insect pests, fungal diseases, air pollution, and inappropriate cultivation of woody plants may result in death of individual trees or damage to whole stands of woody plants on large areas.

Specific conditions of urban greenery greatly differ from those of native greenery and assorted negative factors cause enfeeblement of urban greenery and consequent weak resistance to diseases and pests.

MATERIALS AND METHODS

The basic working method was direct investigation in the field including determination of insect species and evaluation of their damaging. Detailed evaluation of the occurrence and extent of damage caused by different pest species was done 3-4 times during the vegetation period on permanent model areas of different greenery categories.

Pest species were identified mainly on the basis of damage symptoms and consequences (feeding marks, insect developmental stages) in the field or on collected material using keys for determination and scientific literature in the laboratory.

Determination methods and material are specific for individual insect classes and dependent on the pest's population dynamics and the presence of appropriate host plants (mainly introduced ornamental plants). The methods and materials used have been described and recorded in detail in previously published works and therefore will not be mentioned in this paper.

RESULTS AND DISCUSSION

Introduction of woody plants is accompanied by alteration of the composition of pest species and disease agents. These alterations are a result the transver of pests and diseases (with consequences unknown for a given area) from woody plants of one genus to related ones or totally different introduced woody plants. Results of analyzing the damage done by insect pests to various introduced woody plants can be of commercial and esthetic significance. The resistance of woody plants to pests and diseases is one of the basic indicators of their successful introduction. In recent years, there are records of occurrence and damaging activity of new insect pests on introduced woody plants.

Corythuca ciliata (SAY, 1838) (Heteroptera, Tingidae) was recorded for the first time in Slovakia in Bratislava (1992 – 1993) and later in Komárno and Nitra (1994 – 1995) on its favorite host woody plants, viz., *Platanus occidentalis* L., *P. orientalis* L., and *P. x acerifolia* (Ait.) Wild. Previously, severe damage to plane trees (*Platanus* L.) caused by *Phyllonorycter platani* (Staudinger, 1870) (Lepidoptera, Lithocolletidae) was recorded during the years 1996 – 1999 in Nitra. It should be noted that *Phyllonorycter platani* (Staudinger, 1870) competes for food with *C. ciliata* (TOMICZEK *et al.*, 2005).

Cameraria ohridella (Deschka & Dimic, 1986) (Lepidoptera, Lithocolletidae) was described in 1985 as a new species damaging leaves of *Aesculus hippocastanum* L. in the area of Ohrid in Macedonia. Since then it has spread throughout Europe. In 1989 it was detected in Austria and its first recorded occurrence in Slovakia was in 1994. This pest has spread throughout all of Slovakia and eventually it reached the Czech Republic (in 1993) and lately Poland (in 2002). Its propagation in Europe is promoted by the absence of native predators and availability of sufficient food on trees of *Aesculus hippocastanum* L.

Phyllonorycter robiniellus Clemens, 1859 (Lepidoptera, Lithocolletidae) was introduced into Central Europe (the Czech Republic in 1993 and Slovak Republic in 1995) from North America by aerial transport and through commodity commerce, including importation of agricultural products and ornamental plants (VÁVRA, 1999). It occurs on *Robinia pseudoacacia* L. as a leaf miner, creating spaces within leaves which do not overreach the middle vein. Later, the blots expand and premature leaf-fall occurs (NOVOTNÝ *et al.*, 2000).

Another *R. pseudoacacia* L. pest, *Parectopa robiniella* Clemens, 1863 (Lepidoptera, Lithocolletidae) originates from North America. It has been recorded in the Czech and Slovak

Republics (KULFAN, 1989). This pest mainly appears on the lower level of the tree crown. Its mining occurs on the upper level of the leaf, overreaching the middle vein. *Phyllonorycter issikii* Kumata, 1963 (Hemiptera, Tingidae) was transported into Eastern Europe in the early 1980's. From there it has spread to the west (reaching Slovakia in 1998 and the Czech Republic in 2000) as a pest of the genus *Tilia* L., including introduced species and ornamental cultivars (*Tilia tomentosa* Mill., *T. americana* L.) (TOMICZEK *et al.*, 2005).

Phyllonorycter leucographellus (Zeller, 1850) (Lepidoptera, Lithocolletidae), was transported to Europe from Asia together with the host woody plant *Pyracantha coccinea* Roem. This pest occurs in hedges of recreational areas near the seacoast in Italy. Its occurrence has been recorded in the Czech Republic and Slovakia by VÁVRA (1999) and TOMICZEK (2005).

The caterpillar of *Argyresthia trifasciata* Staudinger, 1871 (Lepidoptera, Yponomeutidae) lives on branches of *Juniperus* sp., for example *Juniperus virginiana* L. This caterpillar has been determined in the Czech Republic (in 1995) and frequently in Slovakia since 1998.

Argyresthia thuella (Packard, 1871) (Lepidoptera, Yponomeutidae), in Western Europe was first recorded near the Atlantic Coast. Its occurrence was recorded on *Thuja* sp. at the same time in the Czech (in Prague in 1988) and Slovak (in Arborétum Mlyňany SAS in 1990 on *Thuja occidentalis* 'Malonyana') Republics. This pest probably originated in North America on *Thuja occidentalis* L. and *T. plicata* Lamb. From there it was carried to Western Europe, where it is constantly disseminated with planting material and probably by wind flows.

Hyphantria cunea (Drury, 1773) (Lepidoptera, Arctiidae) is a pest that originated from North America. In Central Europe it has two generations (caterpillar eclosion is in the second half of May and second half of July) on deciduous woody plants, mainly *Juglans regia* L., *J. nigra* L., *Morus alba* L., *M. nigra* L., *Negundo aceroides* Moench., and *Populus* sp. The first disastrous mass outbreak of this pest was in 1953, and outbreaks occurred repeatedly during the period of 1992 – 2002 in Southwest Slovakia.

Dasyneura gleditschiae (Osten Sacken, 1866) (Diptera, Cecidomyiidae) was first time recorded in Slovakia in 1995 (Nitra) and in the Czech Republic (in 1997) on *Gleditsia triacanthos* L. It occurs quite frequently in the Western U.S.A. (HRUBÍK, 1999).

Phloeosinus thujae (Perris, 1855) (Coleoptera, Scolytidae) occurs quite frequently on drought-damaged trees of the genera *Thuja*, *Juniperus*, and *Chamaecyparis* in Arborétum Mlyňany SAS in Slovakia.

The originally American species *Coleotechnites piceaella* (Kearfott, 1903) (Lepidoptera, Gelechiidae), was registered for the first time in our country in 1990 (KULFAN *et al.*, 1998) mainly occurring on *Picea pungens* Engelm. and *P. abies* (L.) Karst. It also found in Austria, Hungary, the Czech Republic, Germany, Great Britain, and Italy. The pest gnaws the needles, which soon become dry. The caterpillars spin needles together, creating needle clusters (NOVOTNÝ *et al.*, 2000).

Long-term research on pests and diseases of *Castanea sativa* Mill. as an introduced woody plant in Slovakia, has yielded interesting results on fruit and seed pests.

Curculio elephas (Gyllenhal, 1836) (Coleoptera, Curculionidae) has spread to *Castanea sativa* Mill. in developed areas, mainly in Southern Europe. Chestnuts imported from Southern and Western Europe into Slovakia have more often been reported as hosts of *Cydia amplana* (Hübner, 1800) (Lepidoptera, Tortricidae). A very interesting phenomenon in our conditions is the occurrence of a new pest of chestnut fruits, viz., *Calandra oryzae* L. (Coleoptera, Curculionidae) (HRUBÍK, 1970, 1974).

In 1993 a mass outbreak of *Ips duplicatus* (Sahlberg, 1836) (Coleoptera, Scolytidae) occurred in Northern Moravia. Pheromones decoys have used for its monitoring and elimination in Slovakia, Southern Poland, and the Czech Republic. The pest was subsequently found out in the northwest part of Slovakia (the Kysuce area is in danger at present).

Anoplophora glabripennis Motschulsky, 1853 (Coleoptera, Cerambycidae) originates from China and is a serious pest of poplars (*Populus sp.*), willows (*Salix sp.*), maples (*Acer sp.*), elms (*Ulmus sp.*), and some other woody plants. It was first recorded in the U.S.A., where it represents a serious danger. Its introduction into Europe has not been confirmed yet, but neither has such a possibility been eliminated (NOVOTNÝ *et al.*, 2000).

The dangerous chestnut pest *Dryocosmus kuriphilus* Yasamatsu, 1951 (Hymenoptera, Cynipidae) originates from China and has gradually spread into Korea, Japan and Italy, finally reaching Slovenia and France in 2005. The occurrence of *D. kuriphilus* Yasamatsu has not yet been noticed either in the Czech Republic (SLIACKY, 2007) or Slovakia (up to March of 2007). The host plants of *Dryocosmus kuriphilus* YASAMATSU include: *Castanea crenata* Sieb. & Zucc., *C. dentata* Marsh., *C. mollissima* Bge., *C. seguinii* Dode, and *C. sativa* Mill. and its hybrids.

The occurrence of *Dreyfusia prelli* Grosmann, 1935 (Sternorrhyncha, Adelgidae) in Slovakia was first observed on *Picea orientalis* Link. in Arborétum Mlyňany (HOCHMUT, 1968), and *Bruchophagus sophorae* (Crosby & Crosby, 1929) was recorded seeds of on *Sophora japonica* L. (HRUBÍK AND VOOKOVÁ, 1993).

REFERENCES

- HOCHMUT, R. 1968: The occurrence of some less known suck pests on woody plants in CSSR. *Lesn. Práce*, Praha, 47, 1968, 2, pp. 80-84. [in Czech]
- HRUBÍK, P. 1970: New pests of chestnut's fruits (*Castanea sativa* Mill.). *Ochrana fauny*, 4, 1970, 4, pp. 169-171. [in Slovak]
- HRUBÍK, P. 1974: Chestnut's pests under our conditions. *Les*, 30, 1974, 6, pp. 257-258. [in Slovak]
- HRUBÍK, P. 1999: The first finding of *Dasineura gleditchiae* (Diptera: Cecidomyiidae) in Slovakia. *Entomofauna Carpathica*, 11, 1999, pp. 6-8. [in Slovak]
- HRUBÍK, P. - VOOKOVÁ, B. 1993: New pest of sophora (*Sophora japonica* L) seeds in Slovakia and possibilities its micropropagation *in vitro*. *Zahradnictví*, 20, 1993, 1, pp. 57-63. [in Slovak]
- KULFAN, M. 1989: Occurrence of the American species *Parectopa robiniella* (Clemens) (Lepidoptera, Gracillariidae) in South Slovakia. *Biológia*, 44, 1989, 2, pp. 185-188.
- KULFAN, J. - PATOČKA, I. - ZACH, P. 1998: New pest of decorative spruce, *Coleotechnites piceaella*. *Zahrada-Park-Krajina*, SZKT, Praha, 1998, pp. 12-15. [in Slovak]
- NOVOTNÝ, J. - ZÚBRIK, M. 2000: Biotic pests of Slovak forests. *Lesnícka sekcia Ministerstva pôdohospodárstva SR*, Bratislava, 2000, 207 p. ISBN 80-967541-1-4. [in Slovak]
- SLIACKY, P. 2007: Dangerous chestnut pests. *Zahradnictví*, 2, 2007, pp. 36-37. [in Czech]
- TOMICZEK, CH. - CEC, T. - KREHAN, H. - PERNY, B. - HLUCHÝ, M. 2005: Atlas of diseases and pests of ornamental woody plants. *Biocont Laboratory*, Brno, 2005, 224 p. ISBN 80-901874-5-5. [in Czech]
- VÁVRA, I. 1999: Uninvited pests migrants in our parks. *Živa*, 2, 1999, p. 80-82. [in Czech]

ШТЕТНЕ ВРСТЕ ИНСЕКТА НА ИНТРОДУКОВАНИМ ДРВЕНАСТИМ БИЉКАМА У СЛОВАЧКОЈ

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ИЗВОД

Зеленило у комерцијално-стамбеним четвртима има веома важну улогу хигијенског, естетског, изолаторског и климатског елемента. Како би биљке могле да врше ове функције, морају бити у добром стању. Специфични услови у којима живе биљке у урбаном окружењу значајно се разликују од услова у којима живе биљке у природи. Дрвенасте биљке се у градовима срећу се штетним продуктима средине као што су прашина, издувни гасови и испарења, со у зимским условима, суша, итд., и стога мање или више подлежу утицају угрожавајућих фактора. Последица тога је смањење дужине живота и естетске вредности ових биљака.

Током истраживања регистровано је 238 штетних врста инсеката на одабраним локацијама. Резултати су показали да би највећу пажњу требало усмерити на инсекте који сишу биљне сокове, минере и полифагне врсте инсеката из реда *Lepidoptera*. Неопходно је вршити мониторинг врста инсеката које изазивају стварање дефеката на дрвету и тако „отварају врата” гљивичним обољењима. Резултати истраживања су потврдили прилично честу појаву физиолошких оштећења на дрвенастим биљкама, углавном изазваних недостатком воде, повећаном концентрацијом соли, смрзавањем као и другим стресним факторима.

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