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CYPRESS BORER (*LAMPRODILA FESTIVA*), A NEW URBAN PEST IN HUNGARY

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The most popular evergreens in parks and home gardens, *Thuja occindentalis*, *T. plicata*, *Platycladus orientalis* (syn. *Thuja orientalis*), are stressed by dry and hot summers of last seasons. Then these weak, vulnerable trees were injured by secondary pests. During investigations in June 2013 and January 2014 at the Central Conifer Collection of Corvinus University Budapest, the highest injuries of the cypress borer (*Lamprodila festiva*) were detected on *Thuja occidentalis* cultivars 'Asplenifolia', 'Bodmeri', 'Recurva Nana', 'Rheingold', 'Smaragd', *Platycladus orientalis* 'Juniperoides', while the other cultivars, especially the columnar *T. o.* 'Henezia' and 'Fastigiata', the yellow-leaved *T. o.* 'Yellow Ribbon' and 'Sunkist', the globular cultivars, and practically all the *T. plicata* and the remaining *Platycladus orientalis* cultivars proved to be saved (yet) by the borer. (Total number of inspected *Thuja* and *Platycladus* cultivars was 108). From the genus *Chamaecyparis* (altogether 69 cultivars) only some juvenile forms, wile from the genus *Juniperus* (altogether 218 cultivars) *Juniperus scopolorum* 'Skyrocket' were injured.

Keywords: *Lamprodila festiva*, sensitivity, *Thuja*, *Platycladus*, cypress beetle

Introduction

Thuja cultivars are the most popular evergreen ornamental trees in Hungary. Among these trees *Thuja occidentalis* (eastern arborvitae, white cedar), what has got plenty of colour and size to wide usage. *Thuja plicata* (giant arborvitae) and *Thuja orientalis* (oriental arborvitae, the current latin name is *Platycladus orientalis*) are frequently planted, too (Tóth, 2012; Schmidt and Tóth, 2006). Thuja trees, planted out to parks and gardens, are stressed by dry and hot summers lately. The summer heat waves stressed these trees so much that plants run dry even under irrigated conditions because of shallow roots. As the balance between foliage and root mass is lost, some trees ran dry, but majority of them are underdeveloped and showed drought stress symptoms. These weak plants are injured by secondary pests, such as cypress beetle (*Lamprodila festiva*) from Mediterranean, what occurred the biggest injuries currently (Bodor, 2012; Németh, 2012; Maráczi, 2013).

The species of jewel beetles are numbered 119 in Hungary (Németh, 2013a, 2013b). In 1999, cypress beetle was firstly found in Landscape Protector Area of Old Juniper Woodland, Barcs (Muskovits, 2001), shortly it was protected. Two years ago, cypress beetle was detected en masse in region of Budapest, elsewhere trees killed by cypress beetle were found – especially where lots of arborvitae was planted.

The life cycle of cypress beetle takes one year. The identification of injury (drying starting from top of plants, the green colour of shoots fading, and then light brown from inside to outside, in the end run dry fully) is complicated and needs some skill. The oval emergence holes and the adult beetles can be observed and define exactly May and June of next year after the starting of injuring.

Our preliminary observation suggests that infection of cypress beetle is different on each species of *Thuja*. This suggests that some of them are less vulnerable against cypress beetles. The aim of our investigations was monitoring *Thuja* and *Platycladus* (earlier belongs to genus *Thuja*) cultivars on the susceptibility to cypress beetle (*Lamprodila festiva*). Less vulnerable species could be recommended for propagators and customers based on this investigation.

Materials and Methods

This trial was carried out in Experimental and Research Farm of Corvinus University of Budapest, Faculty of Horticultural Science. The farm is located in Central Hungary on light sandy soil with pH of 7.8, the yearly average temperature is 11.3 °C, the hours of sunlight are 2079 and annual precipitation is 550 mm. Central Coniferous Collection is located on 2 hectares. The collection amounts 584 conifers, from them there are 108 *Thuja* and *Platycladus* species and cultivars. Each taxa has got 5–5 stools in two replicates with optimal spacing to growth representatively.

Monitoring had done in June 2013 and it was continued with more details from late January to early February 2014. In the first stage in June 2013, the cypress beetle was identified on these trees in Central Coniferous Collection. In the second stage from late January to early

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February 2014, the injury of cypress beetle in percent was assessed on each and every species of *Thuja*. As a secondary investigation, the monitoring covered other evergreens with scale-like foliage, such as *Chamaecyparis* and *Juniperus*, and some taxa were evaluated by the symptoms of cypress beetle injuries.

Results and discussion

The results of valued injuries on investigated trees are found in Table 1. There were 17 injured taxa from the rich collection of *Thuja* and *Platylcadus* with 108 taxa. The most injured trees were all the cultivars of *Thuja occidentalis*, especially 'Smaragd', 'Spiralis', 'Semperaurea', 'Asplenifolia', 'Barabits Gold' and 'Bodmeri'.

The above mentioned cultivars of *Thuja occidentalis* ('Smaragd', 'Spiralis', 'Semperauera', 'Asplenifolia', 'Barabits Gold' and 'Bodmeri') are very susceptible against cypress beetle injuring. All of these cultivars – except 'Barabits Gold' – are selections from West-Europe with humid climate. We concluded that they are more vulnerable under Hungarian continental, semiarid climate and under shaded conditions. The changing climate (more and more warmer) forecasts that the area of cypress beetle will be spreading (Moraal, 2010).

The injury was minimal on all the cultivars of *Thuja plicata* (Table 1). Only on 'Juniperoides' cultivar, belongs to *Platycladus orientalis* (earlier *Thuja orientalis*) was found injury in 40%, whereas all the others from species of *Platycladus orientalis* were particularly free from cypress beetle. However, on these trees was occurring *Kabatina thujae*, where the shoots covered each others.

Generally we can conclude that species and cultivars with closed branching and crowded crown (especially low, compact globular and oval shapes) kept full healthy, whereas the trees with horizontal, loose branching and juvenile forms were more or less injured.

Chamaecyparis lawsoniana 'Silvania' and 'Stewartii' cultivars from the genus *Chamaecyparis* were injured in 40% respectively in 10%. From *Chamaecyparis pisifera* cultivars the following were particularly deadly injured: 'Boulevard', 'Plumosa Aurea' and 'Squarossa Lombarts'.

From the 33 cultivars of *Juniperus communis* only 'Bakony' and 'Hibernica' showed some symptoms of injury where the trees were shaded. However, the identification of injuries was complicated because of similar symptoms (emergence hole with frass) of cypress beetle and *Phloeosinus thujae* (arborvitae bark beetle) (Seybold et al., 2008). The cultivar *Juniperus scopulorum* 'Skyrocket' only was injured in 100%.

Actually, there are differences of tolerance or resistance against environmental conditions and cypress beetle injuring between genus *Thuja* and *Platycladus*. The vulnerability of cultivars against cypress beetle is definitely different. It can be caused by the branching of crown and by the physiological processes in plants. Where the evaporating surface was less exposed through the compact canopy, the trees could survive with more chances the summer heat waves and drought stress. Prevention will be the first to protect coniferous evergreen: keeping plants healthy can minimize injury from secondary pests (Buss and Foltz, 2009). Hayes et al. (2008) mentioned that secondary metabolites are changed in a weaken trees, what change is liked by borers.

The juvenile forms from genus *Chamaecyparis* are very sensitive to drought and evaporate more as it is well-known, that's why they are susceptible to injuring

Table 1 Degree of injury of cypress beetle (*Lamprodila festiva*) in Central Coniferous Collection, Soroksár, Budapest, Hungary, 2013–2014

Latin name	Degree of injury in %	Latin name	Degree of injury in %
Chamaecyparis lawsoniana 'Silvania'	40	*Thuja occidentalis* 'Gold Fassel'	10
Chamaecyparis lawsoniana 'Stewartii'	10	*Thuja occidentalis* 'Hoersholmiensis'	80
***Chamaecyparis pisifera* 'Boulevard'**	**100**	*Thuja occidentalis* 'Malonyana'	5
***Chamaecyparis pisifera* 'Plumosa Aurea'**	**100**	***Thuja occidentalis* 'Recurva Nana'**	**90**
***Chamaecyparis pisifera* 'Squarossa Lombarts'**	**100**	*Thuja occidentalis* 'Rheingold'	40
Juniperus communis 'Bakony'	50	*Thuja occidentalis* 'Semperaurea'	40
Juniperus communis 'Hibernica'	50	***Thuja occidentalis* 'Smaragd'**	**70**
***Juniperus scopulorum* 'Skyrocket'**	**100**	*Thuja occidentalis* 'Stelina'	15
Platycladus orientalis 'Juniperoides'	40	*Thuja occidentalis* 'Szőlősi klón'	5
***Thuja occidentalis* 'Barabits Gold'**	**100**	*Thuja occidentalis* 'Yellow Ribbon'	30
Thuja occidentalis 'Bodmeri'	40	*Thuja plicata* 'Gelderland'	5
Thuja occidentalis 'Columna'	5	*Thuja plicata* 'Gold Perle'	10
Thuja occidentalis 'Europe Gold'	10		

Note: Names with bold letters show the highest degree of injury

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of cypress beetle. The injury of *Juniperus scopulorum* 'Skyrocket' cultivar was caused by its popularity in country, so the cypress beetle could specialize on this cultivar.

Only two cultivars were injured by cypress beetle from *Juniperus communis* cultivars in our investigation. However these injuries appeared in shaded site, while cypress beetles like sunshine and warm (Németh, 2012). The question is still to be answered: this beetles like sunshine, but the injuries appear in shaded sites. This topic requires more interest and further studies.

Conclusions

1. Actually, there are differences of resistance or tolerance against environmental conditions and cypress beetle injuring between genus *Thuja* and *Platycladus*.
2. In all the taxa we found some cultivars what show less vulnerability. We can recommend the following cultivars. *Thuja occidentalis* 'Henezia' and 'Fastigiata' for columnar shape, *Thuja occidentalis* 'Yellow Ribbon' and 'Sunkist' together with *Thuja plicata* and *Platycladus orientalis* cultivars with yellowish foliage.
3. The cypress beetle likes the stressed, weaken plants, that's why it is important to plant coniferous evergreen under optimal conditions.
4. *Juniperus communis* cultivars are less susceptible against cypress beetle.

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References

BODOR, J. 2012. A tuják kártevői – Kertészet és Szőlészet. In: Pests of genus *Thuja,* 2012, no. 34, p. 24–26.

BUSS, E. A. – FOLTZ, J. L. 2009. Insect borers of Trees and Shrubs. University of Florida. IFAS Extension, 2009, p. 7. http://edis.ifas.ufl.edu/mg007.

HAYES, J. L. – JOHNSON, P. L. – EGLITIS, A. – SCOTT, D. W. – SPIEGEL, L. – SCHMITT, C. L. – SMITH, S. E. 2008. Response of bark and woodboring beetles to host volatiles and wounding on western juniper. In: Western Journal of Applied Forestry, 2008, no. 23, p. 206–215.

MARÁCZI, L. 2013. Díszfák, díszcserjék védelme – Nyugat-dunántúli Díszfaiskolások Egyesülete Szombathely. Protect of ornamental trees and shrubs. 2013, pp. 626.

MORAAL, L. G. 2010. Infestitations of the cypress bark beetles *Phloeosinus rudis*, *P. bicolor* and *P. thujae* in The Netherlands (*Coleoptera*: *Curculionidae*: *Scolytinae*). In: Entomologishe Berichten, vol. 70, 2010, no. 4, p. 140–145.

MUSKOVITS, J. 2001. Somogy megye díszbogarai (*Coleoptera*: *Buprestidae*). In: Ábrahám L. (szerk.): Somogy fauna katalógusa – Natura Somogyiensis. In: Jewel beetles in county Somogy, 2001, no. 3, p. 169–178.

NÉMETH, T. 2012. Védett bogárból tujakártevő – National Geographic Online. http://www.ng.hu/Termeszet/2012/08/vedett_bogarbol_tujakartevo (Hozzáférés: 2013.VI.11.) A protected beetle turns into pest on *Thuja*, 2012.

NÉMETH, T. 2013a. A főváros repülő ékkövei – Élet és Tudomány. In: Flying jewels in capital town, vol. 68, 2013, no. 15, p. 454–456.

NÉMETH, T. 2013b. A boróka-tarkadíszbogár (*Lamprodila festiva*) megjelenése és kártétele Budapesten – Növényvédelem, Appearance and injury of cypress beetle *Lamprodila festiva* in Budapest, vol. 49, 2013, no. 8, p. 367–369.

SCHMIDT, G. – TÓTH, I. 2006. Kertészeti Dendrológia. In: Mezőgazda Kiadó, Horticultural Dendrology, 2006, no. pp. 404.

SEYBOLD, S. J. – PAINE, T. D. – DREISTADT, S. H. 2008. Bark beetles. Integrated Pest Management for Home Gardeners and Landscape Professionals. California : University of California Agriculture and Natural Resources, 2008, pp. 7.

TÓTH, I. 2012. Lomblevelű díszfák, díszcserjék kézikönyve – Tarkavirág Kereskedelmi és Szolgáltató Kft. Dunaharaszti. In: Manual of deciduous ornamental trees and shrubs, 2012, pp. 789.