



LAMPRODILA (PALMAR) FESTIVA (COLEOPTERA, BUPRESTIDAE) A NEW ADVENTIVE JEWEL BEETLE PEST OF CUPRESSACEAE IN SLOVAKIA

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Abstract: The new adventive species *Lamprodila (Palmar) festiva* (Linné, 1767) is first recorded from Slovakia from both, urban and natural habitats. The work provides exact geographical records, data on biology and host plants. All data are supported by numerous illustrations. The distribution on the territory of capital Bratislava is mapped. The paper is complemented by compilation of biological and distributional data from many other publications. In Slovakia, *Lamprodila festiva* is frequently found along with longhorn beetle *Semanotus ruscicus* (Fabricius, 1776), which is protected in Slovakia and was known to date only from a few sites.

Key words: *Lamprodila festiva*, Coleoptera, Buprestidae, faunistics, Slovakia

INTRODUCTION

The climate change and global trading triggered massive environmental changes because of presenting great opportunity for invasive or adventive species to occupy new territories. Trees (mostly in urban areas) stressed by high temperatures or drought are getting very sensitive to new insect pests. In recent years, jewel beetles from the family Buprestidae are notoriously known for vigorous invasive potential and destructive efficiency. From them, the best known is emerald ash borer (EAB) *Agrilus planipennis* Fairmaire, 1888 due to its outbreak in North America (HAACK et al. 2002) and Russia. The very similar threat may pose recent introduction of *Agrilus bilineatus* (Weber, 1801) from North America to Turkey (JENDEK 2016, HIZAL et al. 2018) belonging to serious pest of oaks (*Quercus*).

The Cypress Jewel Beetle *Lamprodila (Palmar) festiva* (Linné, 1767) is spreading rapidly from its native Mediterranean areal northwards. It naturally develops in *Juniperus*, but recently adapted to new host plants like *Chamaecyparis*, *Cupressus*, *Platyclusus* and *Thuja*. The species attacks sound or stressed trees and is capable of killing them within 2–3 years. The species was already recorded from all neighboring countries except for Poland and Ukraine. This work provides the first data and observations from Slovakia.

MATERIAL AND METHODS

The majority of data were collected during short term (May-June 2018) survey on the territory of town Bratislava (Slovakia). They are complemented by other Slovak records from other sources. The goal of the survey in town was outlining the extent of infestation and not detailed monitoring of species occurrence. The positive infestation was determined by dieback symptoms and by the presence of distinctive exit holes and/or galleries. All findings were photographed and geotagged.

RESULTS

Systematic position

Lamprodila (Palmar) festiva belongs to the beetle family Buprestidae. The species was until recently classified in various generic and subgeneric combinations like *Buprestis*, *Lampra*, *Palmar*, *Dendrochariessa* and *Ovalisia*. The genus *Lamprodila* comprises 86 species in 8 subgenera distributed mainly in Southeast Asia and Melanesia. The subgenus *Palmar* with 42 species is distinctive by large dark spots on elytra. Beside *Lamprodila festiva*, the genus includes another two infamous pests, *Lamprodila rutilans* (Fabricius, 1777) on *Tilia* and *Lamprodila mirifica* (Mulsant, 1855) on *Ulmus*. For further systematic data see VOLKOVITSH & KARPUN (2017).

History of incursion in Europe

The outline of adaptation of *Lamprodila festiva* to new hosts and its spreading to new territories was given by ČÍŽEK (2017) who dated its beginning in the 1990s. Here is an overview of most recent country records: Austria (RABL et al. 2017); Czech Republic (BÍLÝ 2017, ČÍŽEK 2017); France (BARBIER, 2002); Germany (KAHLEN 2011, KÖHLER 2011); Hungary (SCHMIDT et al. 2015); Italy (HELLRIGL 2012, SALVETTI 2013, PEDERSOLI 2016); Luxembourg (THOMA & EICKERMANN 2014); Romania (RUICANESCU 2013, NITZU et al. 2016); Russia: Krasnodar (KARPUN & VOLKOVITSH 2016, VOLKOVITSH & KARPUN 2017); Slovenia (RAZINGER et al. 2013); Spain (UGARTE SAN VICENTE et al. 2011, LÓPEZ-PÉREZ 2016).

RECORDS FROM SLOVAKIA

According to M. Škorpík (pers. com.), three historical specimens are preserved in Muzeum Beskyd Frýdek-Místek with label "Slovakia". The character of label indicates the date from the thirties of the last century. These specimens may represent the oldest material from Slovakia.

The first recent record comes from 2017, Bratislava-Rača, when 4 specimens of *L. festiva* were intercepted in Malaise trap (M. Kozánek pers. com.).

Findings of *Lamprodila festiva* in Slovakia

a) Bratislava state from June, 2018 (in alphabetical order)

1. Bajkalská (17.14203805, 48.16031927) Fig. 4A
2. Čachtická (17.15463612, 48.21097778)
3. cintorín Rača (17.15560198, 48.21060052)
4. cintorín Slávičie údolie 1 (17.07131943, 48.15537778)
5. cintorín Slávičie údolie 2 (17.06960278, 48.15651667)
6. cintorín Slávičie údolie 3 (17.06878333, 48.15754443)
7. Drieňova (17.14607477, 48.15689648) Fig. 3G
8. Janoškova (17.12819722, 48.17644443)
9. Litovská (17.07150557, 48.1556)
10. Martinský cintorín 1 (17.16152967, 48.16227478) Fig. 3E
11. Martinský cintorín 2 (17.16213048, 48.16124068)
12. Mladá Garda (17.127675, 48.17742222)
13. Mudroňova (17.09103333, 48.15323333)
14. Námestie slobody (17.11229572, 48.15204947)
15. Pavla Horova (16.98099285, 48.20193712) Fig. 3H
16. Pažického (17.09846877, 48.15299898)
17. Pekná cesta (17.13534057, 48.19839463)
18. Pluhova (17.13070278, 48.176925) Fig. 3A
19. Rostovská (17.15448612, 48.20796943) Fig. 3C
20. Rustaveliho (17.15380557, 48.21136388)
21. Ružinovská (17.14907617, 48.15590522) Figs. 3B, 3D
22. Ružová dolina (17.13946178, 48.1537884) Fig. 4B
23. Staré Grunty (17.072725, 48.15536943)
24. Stratená (17.14967222, 48.20223888) Fig. 4D
25. Tomášiková (17.15374167, 48.16412778)
26. Trenčianska (17.14457138, 48.15391277)
27. Trnavská cesta 1 (17.14447618, 48.16321942) Figs. 2E, 2F
28. Trnavská cesta 2 (17.15327918, 48.16491542) Fig. 3F
29. Zelinárska (17.14066388, 48.15451892)
30. Zelinárska (17.14066523, 48.15451803) Fig. 4F
31. Žitná (17.15182778, 48.20547778)

b) Nitra

Southwest Slovakia, Nitra, Hattalova, 20.V. 2018, leg. P. Gažovčiak, 1 specimen

Finding made public online (12.VI.2018):

https://www.nahuby.sk/obrazok_detail.php?obrazok_id=667972&poradie=108&form_hash=gallery

c) Limbach

Southwest Slovakia, Limbach, 7.VII.2018, leg. Laco G., 1 specimen

Finding made public online (8.7.2018)

https://www.nahuby.sk/obrazok_detail.php?obrazok_id=671869

d) Free nature in Kamenica nad Hronom

Southwest Slovakia, Kamenica nad Hronom, 19.vi.2018, leg. R. Szopa and J. Tomčík, 8 specimens collected, 15 specimens observed, host *Juniperus communis*. **Habitat** (Fig. 4C, 4E): Southward oriented shrubby slopes above east border of Kamenica nad Hronom. Former pastures with sparse surviving *Juniperus communis* recently overgrown by *Prunus*, *Rosa canina* and *Crataegus*. Adults were flying and landing on needles and trunks exclusively during hot and sunny hours (32 °C). Collection permit: OU-NR-OSZP1-2018/011998.

Host plants

Lamprodila festiva develops in many species and cultivars of conifers from genera *Chamaecyparis*, *Cupressus*, *Juniperus*, *Platyclusus* and *Thuja*. Most recent host records are: *Chamaecyparis* (SCHMIDT et al. 2015, KARPUN & VOLKOVITSH 2016, VOLKOVITSH & KARPUN 2017); *Cupressus* (VOLKOVITSH & KARPUN 2017); *Juniperus* (UGARTE SAN VINCENTE et al. 2011, SCHMIDT et al. 2015, KARPUN & VOLKOVITSH 2016, PEDERSOLI 2016, VOLKOVITSH & KARPUN 2017); *Platyclusus orientalis* (BÍLÝ 2017 as *Biota orientalis*, SCHMIDT et al. 2015); *Thuja* (RAZINGER et al. 2013, SALVETTI 2013, SCHMIDT et al. 2015, VAYSSIÈRES et al. 2015, KARPUN & VOLKOVITSH 2016, NITZU et al. 2016, BÍLÝ 2017, VOLKOVITSH & KARPUN 2017). Vulnerable cultivars of respective genera are listed by SCHMIDT et al. 2015 and VOLKOVITSH & KARPUN 2017. The genus *Platyclusus* seems to be most resistant to the attack (SCHMIDT et al. 2015).

Biology

The biology was described in details by many authors (e.g. BÍLÝ 2002, BRECHTEL & KOSTENBADER 2002, VOLKOVITSH & KARPUN 2017). In Slovakia, the development was observed in *Thuja* and *Juniperus*. Larva (Fig. 1G) develops in stressed or sound trees and bores flat tunnels in sapwood under bark of trunks or thicker branches (>2 cm). Both, young and older trees are attacked (Figs 2E, 2F). Galleries (Figs 1E, 1G, 1H) are irregular and filled with packed dark sawdust. The mortality of larvae boring in living parts is considerable (Fig. 2A). Massive infestation may cause bark

peeling (Figs 2C, 2D). Grown larva makes pupal chamber shallowly in the wood. The location of pupal chamber is indicated by white sawdust (Fig. 1H). Larval development, at least for part of population, is likely just one year. Fully grown larvae were found in June in living trunks. Adult emerges via distinctive oval exit hole (Fig. 1C). In sunny and hot days from May to end of June, adults were observed flying in crowns (Fig. 1A). Females are found ovipositing on trunks or branches. Eggs were laid predominantly on sun exposed sites but galleries and exit holes were commonly found also on fully shaded places, which is unusual for heliophilous buprestids. The infestation is usually massive (Figs 2C-2F, 3A-3H, 4A-4F) and very destructive. The infested tree dies within 1–3 years. *Lamprodila festiva* is frequently accompanied by longhorn *Semanotus ruscicus* (Fig. 1D) with similar destructive efficiency. Unlike the shallow galleries of *Lamprodila festiva*, the tunnels bored by larva if *Semanotus ruscicus* lays distinctly deeper in the wood (Fig. 1F). *Semanotus ruscicus* belongs in Slovakia to protected species and to date it was known only from several sites. This phenomenon was already mentioned from Prague by ČÍŽEK (2017).

Symptoms of infestation

Attacked plants can be remotely distinguished by dry, reddish needles. The most reliable non-invasive identification is the presence of oval exit holes (0.3–0.5 mm in diameter) which are very distinctive for this pest. *Semanotus ruscicus* has exit holes much larger and less oval.

Distribution

Lamprodila festiva festiva (Linné, 1767). **Europe:** Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Macedonia, Montenegro, Portugal, Romania, Russia (Krasnodar), Slovakia, Slovenia, Spain, Switzerland; **North Africa:** Algeria, Morocco, Tunisia; **West Asia:** Turkey. *Lamprodila festiva holzschuhi* Hellrigl, 1972. **West Asia:** Lebanon, Syria, Turkey (Taurus Mts).

To date (July 2018), the species is known from Southwest Slovakia (Bratislava, Nitra, Kamenica nad Hronom). Based on the massive occurrence in Bratislava, the species is well established in Slovakia and its actual areal is likely much more extensive.

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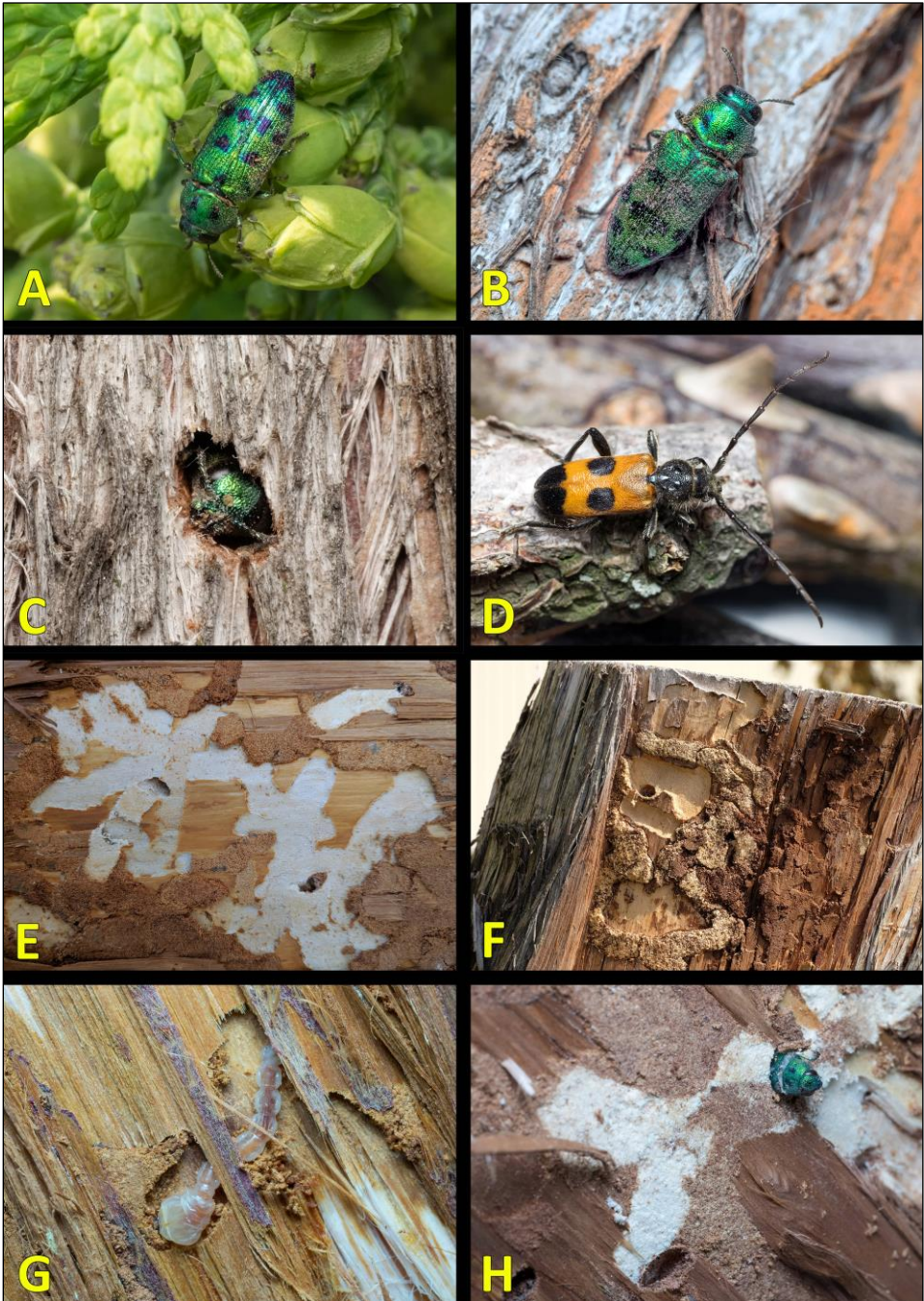


Fig. 1. Buprestidae and Cerambycidae on Cupressaceae. **A–C, E, G–H)** *Lamprodila (Palmar) festiva* (Linné, 1767); **D, F)** *Semanotus ruscicus* (Fabricius, 1776). **A)** adult in crown of *Thuja*; **B, D)** freshly emerged adult; **C)** adult emerging from exit hole; **E–F)** galleries; **G)** larva; **H)** torso of adult.



Fig. 2. Biology of *Lamprodila (Palmar) festiva* (Linné, 1767). A) dead larva in living tree; B–D) exit holes; E–F) symptoms of infestation, site 27.



Fig. 3. Symptoms of infestation and damages caused by larval activity of *Lamprodila (Palmar) festiva* (Linné, 1767) in Bratislava. **A)** site 18; **B, D)** site 21; **C)** site 19; **E)** site 10; **F)** site 28; **G)** site 7; **H)** site 15.

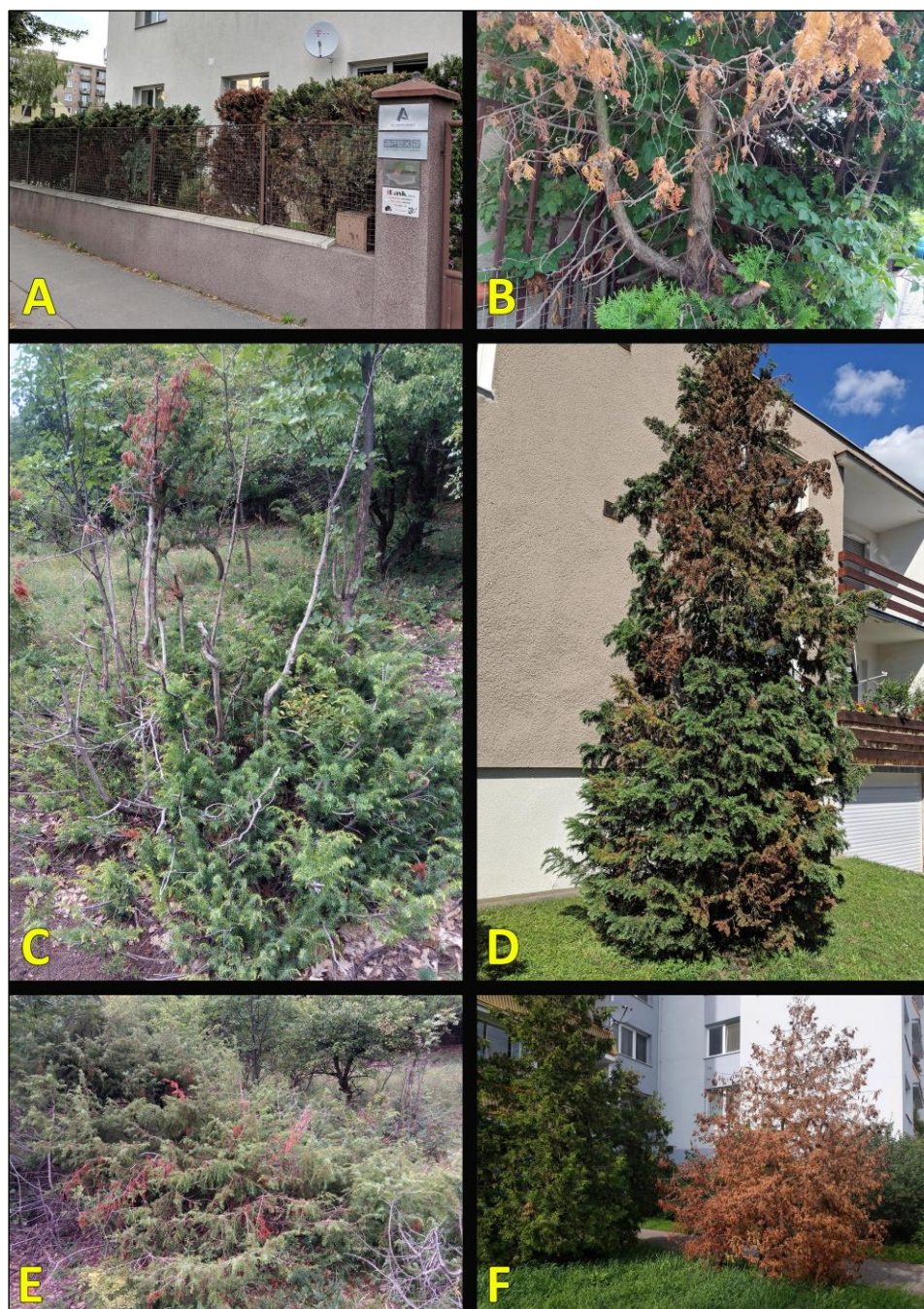


Fig. 4. Symptoms of infestation and damages caused by larval activity of *Lamprodila (Palmar) festiva* (Linné, 1767). **A)** site 1; **B)** site 22; **C, E)** habitat of site in free nature in Kamenica nad Hronom; **D)** site 24; **F)** site 30.

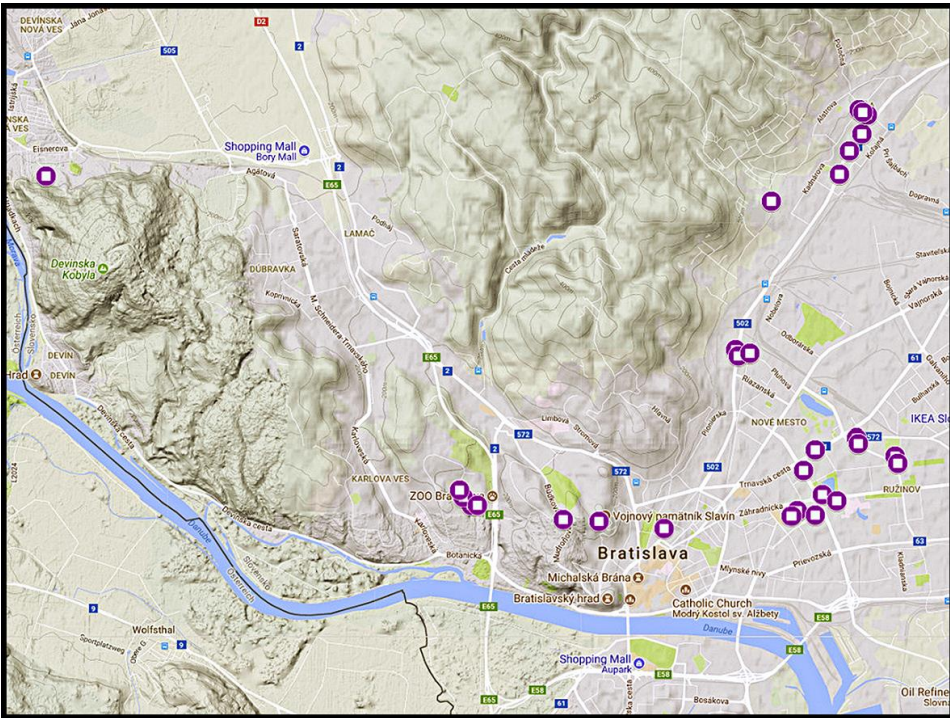


Fig. 5. Findings of *Lamprodila (Palmar) festiva* (Linné, 1767) in Bratislava, Slovakia.

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