

NEW DATA OF THE BOX TREE MOTH *CYDALIMA PERSPECTALIS* (WALKER, 1859) (LEPIDOPTERA: CRAMBIDAE) - RESULTS OF THE INSECT OF THE YEAR 2021 CAMPAIGN

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Introduction

Biological invasion by alien species is a great ecological and economical threat, with a multitude of negative impacts on human and animal health, local biodiversity (flora and fauna) and cultural landscape (Hulme & Roy, 2010). The box tree moth *Cydalima perspectalis* (Walker, 1859) (Lepidoptera: Crambidae) is an invasive species on box tree *Buxus spp.* in Europe, which has been spreading and establishing across the continent during the last decade.

The box tree moth *Cydalima perspectalis* (Walker, 1859) is known from the humid subtropical regions of East Asia, India (Hampson, 1896), China (Walker, 1859), Japan (Inoue, 1982), Korea (Park, 2008), and Far East Russia (Kirpichnikova, 2005). The larvae feed on the leaves of *Buxus microphylla* Siebold & Zucc., but also accept other *Buxus* species (Maruyama, 1993). In 2006, the box tree moth was registered in southwestern Germany (Krüger, 2008). In 2007, it was also found in Switzerland (Billen, 2007) and in the Netherlands (Muus *et al.*, 2009).

The first time in Lithuania *Cydalima perspectalis* was registered 20 09 2018 by Darius Mikalauskas in Vilnius district, Žudiškės (Paulavičiūtė & Mikalauskas, 2018). Every year the range of this species is widening rapidly depending on the distribution of food plants. The goal of The insect of the year 2021 campaign was to find out how widespread *Cydalima perspectalis* is at the moment in Lithuania.

Material and Methods

When the box tree moth *Cydalima perspectalis* was announced as The insect of the year 2021 by the Lithuanian Entomological Society, a brief instruction and a short description of adults, as well as similar species, were published online 15 01 2021 in the website of Kaunas T. Ivanauskas Museum of Zoology (<https://www.zoomuziejus.lt/Naujiena/n2021-uju-metu-vabzdziu-isriktas-buksmedinis-ugniukas>), 23 05 2021 in the website of Lithuanian Entomological Society (<https://www.entomologai.lt/9-naujienos/76-2021-metu-vabzdys-buksmedinis-ugniukas>). In order to disseminate information as much as possible, an article about *C. perspectalis* was published in a Lithuanian journal “Rasos” (Paulavičiūtė, 2021).

The first information was collected from literature sources. All other information about the locations of the *Cydalima perspectalis* was collected from observers who wanted to participate in research. In order to avoid errors in the identification, it was necessary to include photos of a moth, larva or affected plant.

The specimens listed in this paper were collected or observed by Džolita Adamkienė (D.A.), Vidas Brazauskas (V.B.), Ramunė Činčikienė (R.Č.), Jolanta Dagvenckienė (J.D.), Lukas Daksevičius (L.D.), Lina Goberienė (L.G.), Nomeda Grikštaitė (N.G.), Vyktintas Grinkevičius (V.G.), Ingrida Alionienė Gudavičiūtė (I.A.G.), Jurgita Ignotienė (J.Ig.), Vytautas Inokaitis (V.I.), Povilas Ivinskis (P.I.), Ieva Jankauskaitė (I.J.), Kęstutis Jarmalavičius (K.Jar.), Konradas Juzeliūnas (K.J.), Mantas Kaupys (M.K.), Gražina Kazokaitė (G.K.), Angelė Kijutienė (A.K.), Povilas Kruopis (P.K.), Saulius Mažeika (S.M.), Niko M. (N.M.), GEM (G.E.M.), Aistė Natanienė (A.N.), Kęstutis Obelevičius (K.O.), Laimutė Paludnevičienė (L.P.), Brigita Paulavičiūtė (B.P.), Antanas Petraška (A.P.), Jonas Pugevičius (J.P.), Dainius Radzevičius (D.R.), Rasa (Ra.), Grita Reikalaitė (G.R.), Jolanta Rimšaitė (J.R.), Rytis (Ry.), Romualdas (Ro.), Saulius Rumbutis (S.R.), Modestas Ružauskas (M.R.), Žaneta Sagatauskė (Ž.S.), Lolita Salienė (L.Sa.), Darius Sasnauskas (D.S.), Paulius Sluskonis (P.S.), Virginijus Sruoga (V.S.), Linas Stačiokas (L.S.), Inga Stadalienė (I.S.), Dalia Svirmickienė (D.Sv.), Jolanta Šabūnaitė (J.Š.), Kęstutis Šerpenskas (K.Š.), Viktoras Šliaužys (V.Š.), Skomantas Uselis (S.U.), Lina Ūsaitienė (L.Ū.), Kristina Valinčienė (K.V.), Gustina V. (G.V.), Milda Zinkevičiūtė (M.Z.).

List of localities

Locality	Administrative district	Coordinates (LAT, LONG)
Dauparai	Klaipėda mun.	55.71550, 21.30495
Garliava (1)	Kaunas district	54.81918, 23.86880
Garliava (2)	Kaunas district	54.82573, 23.89861
Giraitė	Kaunas district	54.95086, 23.86601
Kalniškės	Vilnius district	54.84681, 25.17739
Kaunas Botanical Garden (1)	Kaunas mun.	54.86944, 23.90945
Kaunas Botanical Garden (2)	Kaunas mun.	54.86908, 23.90935
Kaunas Botanical Garden (3)	Kaunas mun.	54.86879, 23.90945
Kaunas (1)	Kaunas mun.	54.85039, 23.87361
Kaunas (2)	Kaunas mun.	54.91710, 23.87924
Kaunas (3)	Kaunas mun.	54.89979, 23.89375
Kaunas (4)	Kaunas mun.	54.90728, 23.88138
Kaunas (5)	Kaunas mun.	54.93527, 23.89428
Kaunas (6)	Kaunas mun.	54.92866, 23.88932
Kaunas (7)	Kaunas mun.	54.92374, 23.85402
Kaunas (8)	Kaunas mun.	54.90334, 23.97348
Kaunas (9)	Kaunas mun.	54.88629, 23.90062
Kaunas (10)	Kaunas mun.	54.88819, 24.00968
Kaunas (11)	Kaunas mun.	54.92376, 23.96861
Kaunas (12)	Kaunas mun.	54.88598, 23.89343
Kaunas (13)	Kaunas mun.	54.90065, 23.90190
Kaunas (14)	Kaunas mun.	54.95522, 23.94880
Kaunas (15)	Kaunas mun.	54.89474, 23.90154
Kaunas (16)	Kaunas mun.	54.91842, 23.92212
Kaunas (17)	Kaunas mun.	54.90256, 23.96082
Kaunas (18)	Kaunas mun.	54.91228, 23.92313
Kaunas (19)	Kaunas mun.	54.90830, 23.87943
Kaunas (20)	Kaunas mun.	54.90505, 23.91399

Kaunas (21)	Kaunas mun.	54.90036, 23.94024
Kretinga	Kretinga mun.	55.89064, 21.26375
Marvelė (1)	Kaunas mun.	54.89960, 23.85948
Marvelė (2)	Kaunas mun.	54.89876, 23.86487
Neveronys	Kaunas district	54.92674, 24.10099
Palanga	Palanga mun.	55.90676, 21.05511
Perkūnkiemis	Vilnius mun.	54.73981, 25.22796
Radikiai	Kaunas district	54.96370, 23.94961
Raudondvaris	Kaunas district	54.94372, 23.78426
Smiltynė (1)	Klaipėda mun.	55.70726, 21.10775
Smiltynė (2)	Klaipėda mun.	55.67861, 21.10431
Vilnius (1)	Vilnius mun.	54.72993, 25.27026
Vilnius (2)	Vilnius mun.	54.67463, 25.26739
Vilnius (3)	Vilnius mun.	54.71223, 25.19688
Vilnius (4)	Vilnius mun.	54.69882, 25.16776
Vilnius (5)	Vilnius mun.	54.74109, 25.27969
Vilnius (6)	Vilnius mun.	54.72604, 25.30463
Vilnius (7)	Vilnius mun.	54.70219, 25.16811
Vilnius (8)	Vilnius mun.	54.68088, 25.25816
Vilnius (9)	Vilnius mun.	54.70789, 25.17994
Vilnius (10)	Vilnius mun.	54.76119, 25.25085
Vilnius (11)	Vilnius mun.	54.65097, 25.20607
Vilnius (12)	Vilnius mun.	54.68462, 25.30452
Vilnius (13)	Vilnius mun.	54.73027, 25.28143
Vilnius (14)	Vilnius mun.	54.69769, 25.28853
Vilnius (15)	Vilnius mun.	54.77615, 25.35539

List of species

Cydalima perspectalis (Walker, 1859)

Dauparai, 25 08 2021, larva (J.D.); Garliava (1), 30 08 2021, 1 spec. (S.M.); Garliava (2), 24 08 2021, affected plant (J.P.); Giraitė, 30 08 2021, affected plant (A.N.); Kalniškės, 25 09 2020, 1 spec.; (P. I., J. R.); Kaunas (1), 20 05 2021, 12 (larva) (V.B.); Kaunas (2), 16 07 2021, 1 (larva) (S.R.); Kaunas (3), 20 07 2021, 15 (larva) (P.K.); Kaunas (4), 21 07 2021, larva (I.S.), 05 08 2021, 1 spec. (I.S.); Kaunas (5), 30 07 2021, larva (N.G.); Kaunas (6), 01 08 2021, larva (V.Š.); Kaunas (7), 01 08 2021, larva (D.S.), 29 09 2021, affected plant (G.V.); Kaunas (8), 02 08 2021, larva (K.Š.); Kaunas (9), 02 08 2021, 30 (larva) (B.P.); Kaunas (10), 22 08 2021, larva (M.Z.), 04 10 2021, affected plant (G.E.M.); Kaunas (11), 24 08 2021, larva (L.G.); Kaunas (12), 18 07 2021, 1 spec. (P.S.); Kaunas (13), 24 08 2021, affected plant (L.S.); Kaunas (14), 29 08 2021, 1 spec. (L.P.); Kaunas (15), 12 08 2021, 1 spec. (L.Sa.); Kaunas (16), 22 08 2021, 1 spec. (M.R.); Kaunas (17), 30 08 2021, 1 spec. (S.U.); Kaunas (18), 29 09 2021, affected plant (G.V.); Kaunas (19), 29 09 2021, affected plant (G.V.); Kaunas (20), 27 08 2021, 2 spec., 22 08 2021, 1 spec., 11 09 2021, 3 spec. (V.I.); Kaunas (21), 23 08 2021, 3 spec. (V.I.); Kaunas Botanical Garden (1), 14 09 2020, 1 spec. (J.Š.); Kaunas Botanical Garden (2), 21 08 2021, 1 spec. (A.P.); Kaunas Botanical Garden (3), 22 09 2021, 1 spec. (K.O.); Kretinga, 09 09 2021, 1 spec., affected plant (J.Ig.); Marvelė (1), 29 09 2021, affected plant (G.V.); Marvelė (2), 15 08 2021, 1 spec. (I.A.G.); Neveronys, 10 09

2021, 1 spec. (M.R.); Palanga, 11 09 2020, 1 spec. (M.K.); Perkūnkiemis, 10 10 2021, 1 spec. (R.Č.); Radikiai, 15 08 2021, 1 spec. (K.V.); Raudondvaris, 18 09 2021, 1 spec. (K.J.); Smiltynė (1), 04 09 2020, 2 spec., 14 09 2020, 1 spec.; Smiltynė (2), 16 09 2020, 1 spec. (M.K.); Vilnius (1), 04 07 2021, 1 spec. (L.D.); Vilnius (2), 21 07 2021, 3 larva (Ry.); Vilnius (3), 27 08 2021, larva (V.G.); Vilnius (4), 26 08 2021, larva (K.Z.); Vilnius (5), 03 08 2021, 4♂, 2♀ (V.S.); Vilnius (6), 24 08 2021, larva (Ro.); Vilnius (7), 24 08 2021, larva (D.R.); Vilnius (8), 31 08 2021, affected plant (N.M.); Vilnius (9), 24 08 2021, affected plant (G.R.), 29 08 2021, affected plant (G.K.); Vilnius (10), 29 08 2021, affected plant (I.J.); Vilnius (11), 29 08 2021, affected plant (Ž.S.); Vilnius (12), 31 08 2021, 1 spec. (D.A.), 12 09 2021, 1 spec. (L.Ū.); Vilnius (13), 29 08 2021, affected plant (A.K.); Vilnius (14), 09 09 2021, 1 spec. (G.V.); Vilnius (15), 05 10 2021, affected plant (D.Sv.).

Discussion

The box tree moths of *Cydalima perspectalis* are most commonly found next to the food plants and are easily identifiable by appearance. The moths adults are variable. The most common color form has white, slightly iridescent wings with a large dark brown band at the outer margin and a characteristic white spot on the forewing, in the discoidal cell. Hindwings are white with the same band at the outer margin as in the forewings. In a less common colour variant, the adults are completely brown, but still show a white forewing spot. The wingspan is 30–45 mm. Antennae are filiform, with short ciliae in male, thinner in female. Males have tufts of hair on the end of abdomen (Mally & Nuss, 2010). Eggs are laid on the leaves of the host plant in groups of 5–20 (Leuthard & Baur, 2013). The larvae are light green characterized by black stripes with white dots and hairs and shiny black head. In the last larval stage they can reach a length of up to 4 cm (Bella, 2013). The pupae are between 1,5 and 2,0 cm long. Initially green with dark stripes on the dorsal surface, towards the end of pupation they turn brown with a dark pattern corresponding to the brown wing borders of the adult. They are concealed in a cocoon of white silk spun among the leaves and twigs (Korycinska & Eyre, 2009).

The host plants of *C. perspectalis* are *Buxus* spp. In origin countries, it has also been reported on *Euonymus japonicus* Thunb., *E. alata* (Thunb.), *Ilex purpurea* Hassk., *Pachysandra terminalis* Siebold & Zucc., and *Murraya paniculata* (L.) where larvae feed on leaves and are considered serious defoliators (Korycinska & Eyre, 2009; Wang, 2008).

The insect of the year 2021 campaign was productive. Report contained 63 recent facts about *C. perspectalis* that were sent and by 51 observers. Based on literature sources *C. perspectalis* was known just from Žudiškės (Paulavičiūtė, Mikalauskas, 2018), Kalniškės (Ivinskis *at al.*, 2020) and Smiltynė (Ivinskis *at al.*, 2020) in Lithuania. The insect of the year 2021 campaign significantly supplemented the data on distribution of *Cydalima perspectalis*. The new information on moth was provided from 5 districts and municipalities (Kaunas, Klaipėda, Kretinga, Vilnius, Palanga). The data shows that *C. perspectalis* is widespread mostly in the central and southeastern parts of Lithuania. The prevalence of this moth is significantly dependent on the food plant. The most of the locations were found in Kaunas city and Kaunas district. *C. perspectalis* is also widespread in Vilnius city. Even several insect outbreaks have been identified in these cities. The map (fig. 1) shows the locations of *Cydalima perspectalis* in Lithuania after

The insect of the year 2021 campaign.

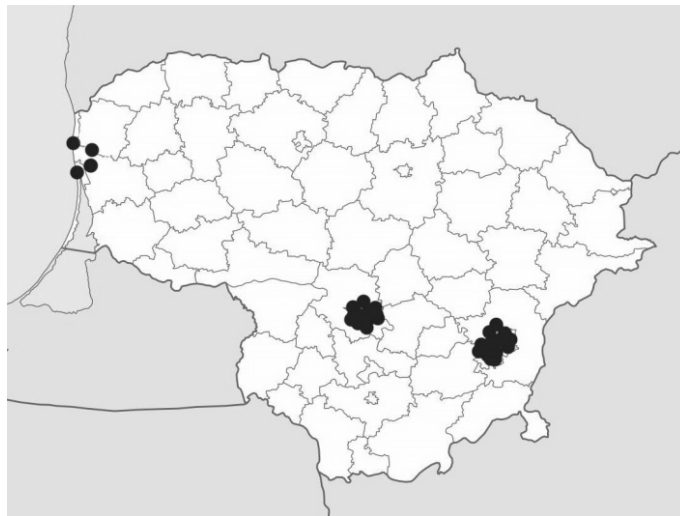


Figure 1. Distribution of *Cydalima perspectalis* in Lithuania in 2021

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Nauji duomenys apie bukšmedinį ugniuką *Cydalima perspectalis* (Walker, 1859) (Lepidoptera: Crambidae) - 2021 metų vabzdžio akcijos rezultatai

B. PAULAVIČIŪTĖ

Santrauka

Straipsnyje apibendrinami akcijos “2021 metų vabzdys bukšmedinis ugniukas (*Cydalima perspectalis*)” rezultatai, taip pat pateikiami iki šiol nepublikuoti duomenys apie bukšmedinio ugniuko radavietes Lietuvoje.

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