https://doi.org/10.52388/1857-064X.2022.2.06

THE CICADA *TAUTONEURA POLYMITUSA* (OH & JUNG, 2016) (HEMIPTERA: CICADELLIDAE) – NEW ADVENTIVE SPECIES FOR THE FAUNA OF THE REPUBLIC OF MOLDOVA

Grozdeva Svetlana

Institute of Zoology

Rezumat

Cicada *Tautoneura polymitusa* (Oh & Jung, 2016) (Hemiptera: Cicadellidae), care recent a fost descrisă în Coreea de Sud, este prezentată ca o specie nouă adventivă pentru fauna Republicii Moldova. Specia a fost depistată în Europa încă în anii 2010-2012 în nordul Italiei, Spania, vestul Sloveniei și Ungaria, iar în anul 2019 a fost observată pe teritoriul Ucrainei și Rusiei. În Republica Moldova *T. polymitusa* are o răspândire limitată și a fost colectată la capcana de lumină în zona de nord a țării.

Cuvinte-cheie: specie adventivă, *Tautoneura polymitusa*, Hemiptera, Cicadellidae, Republica Moldova.

Depus la redacție: 29 iunie 2022

Adresa pentru corespondență. Grozdeva Svetlana, Institutul de Zoologie, str. Academiei, 1, MD-2028, mun.Chișinău, Republica Moldova, e-mail: svetlana.grozdeva.gargalyk@gmail.com

Intoduction

The number of adventive species on the territory of the Republic of Moldova has been growing rapidly in recent years, because of large import of foreign planting material and, probably, under the influence of changing climatic conditions. Globalization and the developement of the trade between countries is another important factor in increasing the number of adventive species. Unfortunally, the necessary actions to prevent the import of the dangerous pests of agricultural crops and forest plants are not always taken in time. As result, a lot of effort and financial expences have to be directed to destroy and regulate the number of such species. A significant part of adventive species belongs to cicadas, among them being *Scaphoideus titanus* (Ball, 1932), *Metcalfa pruinosa* (Say, 1830), *Stictocephala bisonia* (Kopp & Yonke, 1977), *Edwardsiana tshinari* (Zachvatkin, 1947) and *Japananus hyalinus* (Osborn, 1900). The last one was registered in the Republic of Moldova for the first time in 2021. Some of mentioned above cicadas have showed themselves as dangerous pests in conditions of the Republic of Moldova [1, 3, 7, 10].

The *Tautoneura polymitusa* (Oh & Jung, 2016) is a representative of Asian genus *Tautoneura* Anufriev, 1969. The genus *Tautoneura* belongs to Erythroneurini (Typhlocybinae) tribe, by the typical species *Tautoneura tricolor* (Anufriev, 1969). The genus is characterized by a great number of species (about 60), distributed in the Indo-Malay region (India, Southern China, Indochina, Taiwan, the Malay Peninsula), the Eastern Palearctic (Russian Far East, Korea, Eastern China, Japan) and the Pacific Islands (Fiji, Samoa) [4, 6, 9]. Most members of the genus are trophically related to trees

and shrubs and have no economic value. The exception is *Tautoneura mori* (Matsumura, 1906) – a carrier of phytoplasmas, which cause mulberry dwarf and onion yellows [2].

Material and methods

The material was collected by using ultraviolet and white light traps, which were placed in the northwestern part of the Republic of Moldova at the Scientific Station of the Institute of Zoology in Brînzeni commune, Edineț district (48°05′03′′ N, 27°10′32′′E). The light traps were placed at the height of 1.5 m and turned on steadily in the evening at sunset. They were turned on with a frequency of once every 3-4 days, with the exception of the days when it rained or there was a strong wind.

The collected specimens were laid out on cotton pads or fixed in 96% ethanol. Later, the material was studied and determined in laboratory conditions.

In order to identify the cicadas, the well-known keys were used, as well as some of papers, which contain detailed description of the species [4, 5, 6, 8]. Male aedeagus was extracted to accurately identify the species. The work was done by using an MBS-10 microscope.

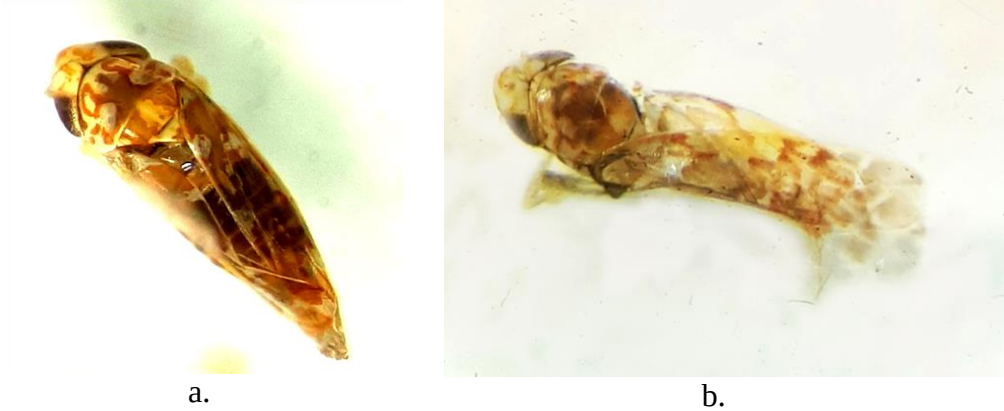
The identified and assembled material is stored in the Museum of Entomology of the Institute of Zoology.

Results and discussion

Material examined. The first specimens of *T. polymitusa* in the Republic of Moldova were found in samples caught on light traps in July and August 2021 in Brînzeni commune, Edineț district. Ultraviolet light: 09.7.2021 – 1 ♀, 13.7.2021 – 3 ♀, 16.7.2021 – 1 ♂, 27.7.2021 – 1 ♀, 1 ♂, 30.7.2021 – 1 ♀, 17. 8. 2021 – 1 ♀. White light: 20.7.2021 – 1 ♀, 06.8.2021 – 2 ♀.

Systematic framing. Order Hemiptera, suborder Auchenorrhyncha, infraorder Cicadomorpha, family Cicadellidae, subfamily Typhlocybinae, tribe Erythroneurini, genus *Tautoneura*.

Description. The dimensions of the body are 2.4-2.6 mm (♂), 2.5-2.7 mm (♀). It is a slim insect with whitish or light yellow coloured body, with brown spots on the fore wings and a characteristic pattern on the head and pronotum, legs are pale yellow coloured, sternites and tergites of the abdomen of the female are dark brown coloured. (fig. 1-a, b). Dorsal surface of genital plates of female and base of pygophore with scattered groups macrochetae, caudal margin of pygophore with minute bristles.



a. b.

Figura 1. *Tautoneura polymitusa*, a – female, b – male, dorsal view (photo: S. Grozdeva)

A good description and illustrations of the male genitalia of *T. polymitusa* are given by the Korean and Hungarian authors [4, 6].

Type locality: Holotype ♂, South Korea, Daejeon, Gung-dong; deposited in Chungnam National University.

Distribution: The cicada *T. polymitusa* was first described based on individuals found on the territory of South Korea in 2016, while the cicada by itself has been regularly noted in large amounts in some European countries years earlier: in northern Italy, Spain and Slovenia – since 2010, in Hungary – since 2012 [5, 6]. This species probably has adapted in Hungary, as it has a large distribution in some locations.

From the very beginning there was no doubt that the cicada was of Asian origin, despite the fact that the species had been noted in Europe. It is first of all due to the fact that none of the 60 species of the genus *Tautoneura* is native to the fauna of Europe [9].

Host plants. The host plant of *T. polymitusa* on the territory of South Korea has not been determined. The description of species was based on several overwintering specimens collected under the bark of *Zelkova serrata* (Thunb.) Makino, which belongs to Ulmaceae family [4].

The population of *T. polymitusa* in Hungary was associated with *Ulmus* sp. Also during the study of closely related species, there was a suggestion that other members of the Ulmaceae family may be attractive to this species [6]. The same information is given for Slovenia, where *Ulmus minor* Mill. (1768) is indicated as host plant [5].

On the territory of Eastern Europe (Donetsk, Luhansk and Rostov regions), all specimens were collected on *U. pulmila* L. which is an invasive species. The material was collected mostly manually, by using glue traps and light traps [9].

Biology. The cicada *T. polymitusa* hibernates in the adult phase. In Hungary, imago has been registered from the middle of April till the end of November [6], in Slovenia – from the end of June till the middle of September [5].

On the territory of the Eastern Europe the first adult insects were seen at the end of March, which coincides with the beginning of the flowering of elms. This is the earliest period of collection of the species for the European part of its range. The largest number of insects was noted in March and April, as well as in October and November. The number of generations per year was not established by the authors [9].

There is information about both monovoltine and multivoltine life cycles of *T. polymitsa* [5, 6]. Cicada populations are dominated by females [5, 9]. It is too early to make the same conclusion for populations from the Republic of Moldova, due to the small amount of material.

It is difficult to define how the cicada appeared on the territory of the Republic of Moldova. Presumably, the import of planting material and traffic flows contributed to its pervasion. The biology and economic importance of *T. polymitusa* within its natural range has not been completely studied yet. But *T. polymitusa* is not an exception – up to now there is no information about the harmfulness in Europe of *Japananus hyalinus*, another Asian species.

Conclusion

The number of adventive insect species, including cicadas, has increased dramatically over the last few years on the territory of the Republic of Moldova. The most obvious reason of this is, probably, the import of planting material in large volumes. This conclusion was supported by the fact that, firstly, new adventive insect species are noted in zones with man-made plantings (homestead and city parks, vineyards, botanical

gardens, etc.). However, after a short period of adaptation, they quickly spread to natural plantings and some of them acquire the status of dangerous pests (*Scaphoideus titanus*, *Metcalfa pruinosa*, *Stictocephala bisonia*). Most species of the genus *Tautoneura* have no economic importance, excepting *T. mori.* Despite the fact that there is currently no information about the harmfulness of the *T. polymitusa* species in Europe, it is important to keep in mind the fact that the range expansion and population increasing of the species may have negative impact on phytosanitary state of elm trees, which are widely used in forestry and urban areas. According to this, the further study of the species *T. polymitusa*, followed by the identification of the ways to regulate its population, as well as to predict the harmfulness of the species is of high importance.

Aknowledgments

I'd like to thank Dr. I. Chiriac (Institute of Zoology) for the provided material. The work was implemented within the project Nr. 20.80009.7007.02. "Evolutionary changes of economically important terrestrial fauna, of rare and protected species under anthropogenic and climatic changes".

References

1. *Grozdeva S.* Fauna cicadelor (Hemiptera: Auchenorrhyncha) din Rezervația "Plaiul Fagului". Fauna Rezervației "Plaiul Fagului". Nevertebrate. Chișinău, 2021, p. 66-80.

2. *Jiang H., Saiki T., Watanabe K., Kawakita H., Sato M.* Possible vector insect of mulberry dwarf phytoplasma, *Tautoneura mori* Matsumura. Journal of General Plant Pathology, 2005. 71(5), p.370-372.

3. *Mifsud D., Cocquempot C., Mühlethaler R., Wilson M., Streito J.-C.* Other Hemiptera Sternorrhyncha (Aleyrodidae, Phylloxeroidea, and Psylloidea) and Hemiptera Auchenorrhyncha. Chapter 9.4, BioRisk – Biodiversity and ecosystem Risk Assessment, 4 (1), 2010, p. 511-552.

4. *Oh S., Pham H. T., Jung S.* Taxonomic review of the Genus *Tautoneura* Anufriev (Hemiptera: Auchenorrhyncha: Cicadellidae: Typhlocybinae) from Korea, with description of one new species. *Zootaxa*, 2016, 4169(1), p. 194-200.

5. *Seljak G.* Notable new findings of Auchenorrhyncha (Hemiptera) in Slovenia. Acta entomologica slovenica, 2018, 26(2), p.181-194.

6. *Toth M., Orosz A., Redei D.* Another alien on the horizon? First European record of *Tautoneura polymitusa*, an East Asian leafhopper (Hemiptera: Auchenorryncha: Cicadellidae). Zootaxa, 2017, 4311(1), p. 137-144.

7. *Ţugulea C., Derjanschi V., Ţugulea A.* Cicada meliferă *Metcalfa pruinosa* (Say, 1830) (Hemiptera, Flatidae) – specie nouă invazivă în fauna Republicii Moldova. Revista de Ştiinţă, Inovare, Cultură şi Artă „Akademos", Nr. 3 (58), 2020, p. 55-59.

8. *Ануфриев Г.А., Емельянов А. Ф.* Определитель насекомых Дальнего востока СССР. Т. 2. Равнокрылые и полужесткокрылые. Ленинград: Наука, 1988, с.57-125.

9. *Губин А. И., Мартынов В. В., Никулина Т. В. Taumoneura polymitusa* Он & Jung, 2016 (Hemiptera: Auchenorrhyncha: Cicadellidae) - новый чужеродный вид цикадок в фауне Восточной Европы В: Российский журнал биологических инвазий. 2020, т. 13 (3), с. 12-16.

10. *Талицкий В. И., Логвиненко В. Н.* Обзор фауны цикадовых (*Homoptera, Cicadinea*) Молдавской ССР. Труды Молдавского научно-исследовательского института садоводства, виноградаства и виноделия. Т. XIII. Кишинёв: Картя Молдовеняскэ, 1966, с. 231-269.