



**FIRST RECORD OF *EMBOLEMUS TAURICUS* (HYMENOPTERA:
EMBOLEMIDAE) AT CONTINENTAL UKRAINE**

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Embolemidae is a small family of chrysidoid wasps (Hymenoptera: Chrysidoidea) understudied in Ukraine. The cosmopolitan genus *Embolemus* is shown comprising only 32 extant and 2 fossil species in the world fauna: the actual check-list for the genus is given. Only two species had been previously registered in Ukraine. *Embolemus ruddii* was recorded at Western Ukraine and Crimea, and *E. tauricus* was described from Crimea based on a single specimen collected at 1910. In present contribution *E. tauricus* is recorded for continental Ukraine for the first time from the Zaporizhia Region. The specimen collected almost fully correspond to the original description of the species, differing only in the small features of coloration. The habitat of *E. tauricus* is briefly described.

Key words: Embolemidae, *Embolemus*, Ukraine, new record, fauna, check-list.

**Перша знахідка *Embolemus tauricus* (Hymenoptera: Embolemidae) на території континентальної України
Мартінова К.В., Мартінов О.В.**

Embolemidae – невелика родина хризидоїдних ос (Hymenoptera: Chrysidoidea), недостатньо вивчена на території України. Космополітичний рід *Embolemus* налічує лише 32 рецентних та 2 викопних види в світовій фауні: актуальний список видів роду наведено в цій роботі. Лише два види роду було раніше зареєстровано на території України. *Embolemus ruddii* був виявлений у Західній Україні та в Криму, а *E. tauricus* був описаний з Криму за єдиним екземпляром, зібраним у 1910 році. В цій роботі *E. tauricus* вперше наведено для континентальної України з території Запорізької області. Досліджений екземпляр майже повністю відповідає оригінальному опису виду, відрізняючись лише незначними рисами забарвлення. Надано короткий опис оселища *E. tauricus*.

Ключові слова: Embolemidae, *Embolemus*, Україна, нова знахідка, фауна, список видів.

**Первая находка *Embolemus tauricus* (Hymenoptera: Embolemidae) на территории континентальной Украины
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Embolemidae – небольшое семейство хризидоидных ос (Hymenoptera: Chrysidoidea), недостаточно изученное на территории Украины. Космополитический род *Embolemus* насчитывает только 32 рецентных и 2 ископаемых вида в мировой фауне: актуальный список видов рода приведен в данной работе. Только два вида рода были ранее зарегистрированы на территории Украины. *Embolemus ruddii* был выявлен в Западной Украине и Криму, а *E. tauricus* был описан из Крима по единственному экземпляру, собранному в 1910 году. В данной работе *E. tauricus* впервые приведен для континентальной Украины с территории Запорожской области. Изученный экземпляр почти полностью соответствует оригинальному описанию вида, отличаясь только незначительными чертами окраски.

Ключевые слова: Embolemidae, *Embolemus*, Украина, новая находка, фауна, список видов.

Introduction

Embolemidae are a small family of chrysidoid wasps (Hymenoptera: Chrysidoidea) that parasitize nymphs of planthoppers (Hemiptera: Auchenorrhyncha) (Olmi, 1996; Varrone and Olmi, 2012; Guglielmino and Bückle, 2013; Olmi et al., 2014a, 2014b). The world fauna comprises only about 50 extant species of embolemid wasps within three genera, *Ampulicomorpha* Ashmead, 1893,

Embolemus Westwood, 1833 and *Trogloembolemus* Olmi, Mita et Guglielmino, 2014. The genus *Trogloembolemus* contains a single species from Japan, while *Embolemus* and *Ampulicomorpha* are distributed in all zoogeographical realms (Olmi et al., 2016). Faunas of tropical and subtropical regions reveal higher abundance of embolemid wasps, than other regions of the planet (Achterberg and Kats, 2000).

Fossil representatives of embolemid wasps are eleven described species: six of them belong to extinct genera †*Baissobius* Rasnitsyn 1975, †*Cretembolemus* Olmi et al. 2014 and †*Embolemopsis* Olmi, Rasnitsyn et Guglielmino, 2010; five more species are assigned to extant genera *Embolemus* and *Ampulicomorpha*. The palaeontological chronicle records Embolemidae starting from Lower Cretaceous (Aptian) and includes imprints from Orapa, Bon-Tsagaan and Baissa and specimens fossilized in Burmese, Alava, Baltic, Rovno and Dominican ambers (Martynova et al., 2019).

Genera *Embolemus* and *Ampulicomorpha* are rather close in morphology, but they differ most evidently in sex dimorphism: females of *Embolemus* are micropterous and females of *Ampulicomorpha* are marcopterous, while males of both genera are fully winged (Olmi, 1996; Olmi et al., 2014a, 2014b, 2016). Thus, van Achterberg and Kats (2000) proposed to synonymize these genera. Nevertheless, the biological criteria (host range) suggests the validity of both taxa: wasps of the genus *Embolemus* are known as parasites of nymphs of Cixiidae (Hemiptera, Fulgoromorpha) living in the soil and feeding on roots, and species of *Ampulicomorpha* parasitize nymphs of Achilidae living in rotten logs and feeding on hyphal sheets of shelf fungi (Bridwell, 1958; Wharton, 1989; Guglielmino and Bückle, 2013). Here, we follow Olmi (1996, 1997, 2016; Olmi et al., 2014a, 2014b) and consider *Embolemus* and *Ampulicomorpha* as a separate valid genera.

Previously only two species of the genus *Embolemus* s. str. were registered in Ukraine: widespread *E. ruddii* Westwood, 1833 was recorded for the European part of the former USSR (Trjapitzin, 1978) and *E. tauricus* Olmi, Belokobylskij et Guglielmino, 2014 was described from the Crimea. In the present contribution we give the second record of *E. tauricus*, which is the first record of this species for continental Ukraine.

Material and methods

A single female specimen of embolemid wasp *E. tauricus* was collected by the Barber pitfall trap (dry method, without fixing liquid) at the vicinities of Davydivka village, Akimov District, Zaporizhzhya Region, 46.517526, 35.186215, on August, 20, 2019. The specimen was preserved with 96% ethanol and is deposited in the collections of I.I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine (Kyiv, Ukraine).

The photographs were taken using a Leica Z16 APO stereomicroscope equipped with Leica DFC 450 camera and processed by LAS Core and Adobe Photoshop software.

Results

The genus *Embolemus* s.str. (sensu Olmi, 1996, 1997; Olmi et al., 2014a, 2014b, 2016) comprises 32 extant species and 2 fossil species:

The check-list of the genus *Embolemus* Westwood, 1833 s. str. (sensu Olmi, 1996)

1. *Embolemus africanus* (Risbec, 1957): Afrotropical realm
2. *Embolemus ambrensis* Olmi, 2004: Afrotropical realm
3. *Embolemus angustipennis* (Kieffer, 1912): Neotropical realm
4. *Embolemus apertus* Azevedo et Amarante, 2005: Neotropical realm
5. *Embolemus bestelmeyeri* Olmi 1997: Neotropical realm
6. *Embolemus brandaoi* Azevedo et Amarante, 2005: Neotropical realm

7. *Embolemus brothersi* Olmi, 2006: Afrotropical realm
8. *Embolemus burundensis* Olmi, 2011 in: Olmi and Copeland, 2011: Afrotropical realm
9. *Embolemus capensis* Olmi, 1997: Afrotropical realm
10. *Embolemus fisheri* Olmi, 2010: Afrotropical realm
11. *Embolemus hachijoensis* Hirashima et Yamagishi, 1975: Indomalayan realm
12. *Embolemus harteni* Olmi, 1997: Palaearctic realm (Yemen)
13. *Embolemus honshuensis* Olmi, Mita et Guglielmino, 2014: Indomalayan realm
14. *Embolemus huberi* Olmi, 1997: Palaearctic realm (Iran)
15. *Embolemus kheeli* Olmi, 2004: Neotropical realm
16. *Embolemus krombeini* Olmi, 1996: Indomalayan realm
17. *Embolemus latus* Azevedo et Amarante, 2005: Neotropical realm
18. *Embolemus nearcticus* (Brues, 1922): Nearctic and Neotropical realms
19. *Embolemus neotropicus* Olmi, 1966: Neotropical realm
20. *Embolemus notogeicus* Olmi, 1966: Australian realm
21. *Embolemus ogloblini* Olmi, 1998: Neotropical realm
22. *Embolemus pecki* Olmi, 1997: East of Palaearctic realm and Indomalayan realm
23. *Embolemus ruddii* Westwood, 1833: North of Palaearctic realm (including Ukraine)
24. *Embolemus sanbornei* Olmi, 1997: Afrotropical realm
25. *Embolemus sensitivus* Xu, Olmi et Guglielmino, 2012: Indomalayan realm
26. *Embolemus stangei* Olmi, 1966: Neotropical realm
27. *Embolemus subtilis* Olmi, 1966: Neotropical realm
28. *Embolemus tauricus* Olmi, Belokobylskij et Guglielmino, 2014: Palaearctic realm (including Ukraine)
29. *Embolemus villemantae* Contarini, Olmi, Capradossi et Guglielmino, 2020 in press: Australian realm
30. *Embolemus walkeri* Richards, 1951: Indomalayan realm
31. *Embolemus wilhelmensis* Olmi, Marletta et Guglielmino, 2016
32. *Embolemus zealandicus* Olmi, 1966: Australian realm
33. †*Embolemus breviscapus* Brues, 1933 (Baltic amber)
34. †*Embolemus excitus* Perrichot et Engel, 2011

The fauna of Palaearctic realm is less abundant in embolemid wasps than other realms, and encompasses only 5 species (see the check-list above). Furthermore, only 3 species are recorded for Europe and only *E. ruddii* and *E. tauricus* are registered in Ukraine (Olmi, 1996, 1997; Achterberg and Kats, 2000; Olmi et al., 2014a).

Embolemus tauricus is recorded in continental part of Ukraine for the first time in this contribution (Zaporizhia Region). Previously, the species was known based only on a female holotype collected in 1910 at Inkerman town, Crimean Peninsula, Ukraine (Olmi et al., 2014a).

Embolemus ruddii was listed in the key to insects of European part of the former USSR with collection areas specified as Western Ukraine and Crimea within Ukraine (Trjapitzin, 1978). Nevertheless, this species is known as being widespread in the Western Palaearctic and also recorded at Eastern Palaearctic (Russian Siberia) (Olmi et al., 2014a). The second species, *E. antennalis* (Kieffer, 1906), given in the Key is now considered as junior synonym of *E. ruddii* (Achterberg and Kats, 2000).

Notes on morphology. The studied specimen of embolemid reveals the main distinguishing character of *E. tauricus* (Fig. 1): dorsal anterior surface of propodeum shiny, weakly granulate, without rugae (Olmi et al., 2014a). It also clearly differs in having the head much longer than high (lateral view) and body testaceous light brown in color. Other characters of studied specimen correspond to the original description of Olmi et al. (2014a), including the body length of about 3 mm.

The single character of *E. tauricus* that can be specified based on additional specimen is the features of the body coloration: in the newly collected female the legs, distal third of the metasoma and apical flagellomeres are lighter brown, than the rest of body (Fig. 1). Possibly, the original coloration of holotype had been changed due to a long time gap (more than 100 years) between the collection and description of the species.

Habitat. *Embolemus tauricus* was collected at the section of dry steppe with sparse vegetation at clay soil. *Artemisia* sp. (Asteraceae) was the dominant plant at the collection cite (Fig. 2). The area studied is a section of steppe of Pryazovia [Cis-Azov region]. Moreover, the collection cite was located close to the bank of Utlyukskyi estuary.

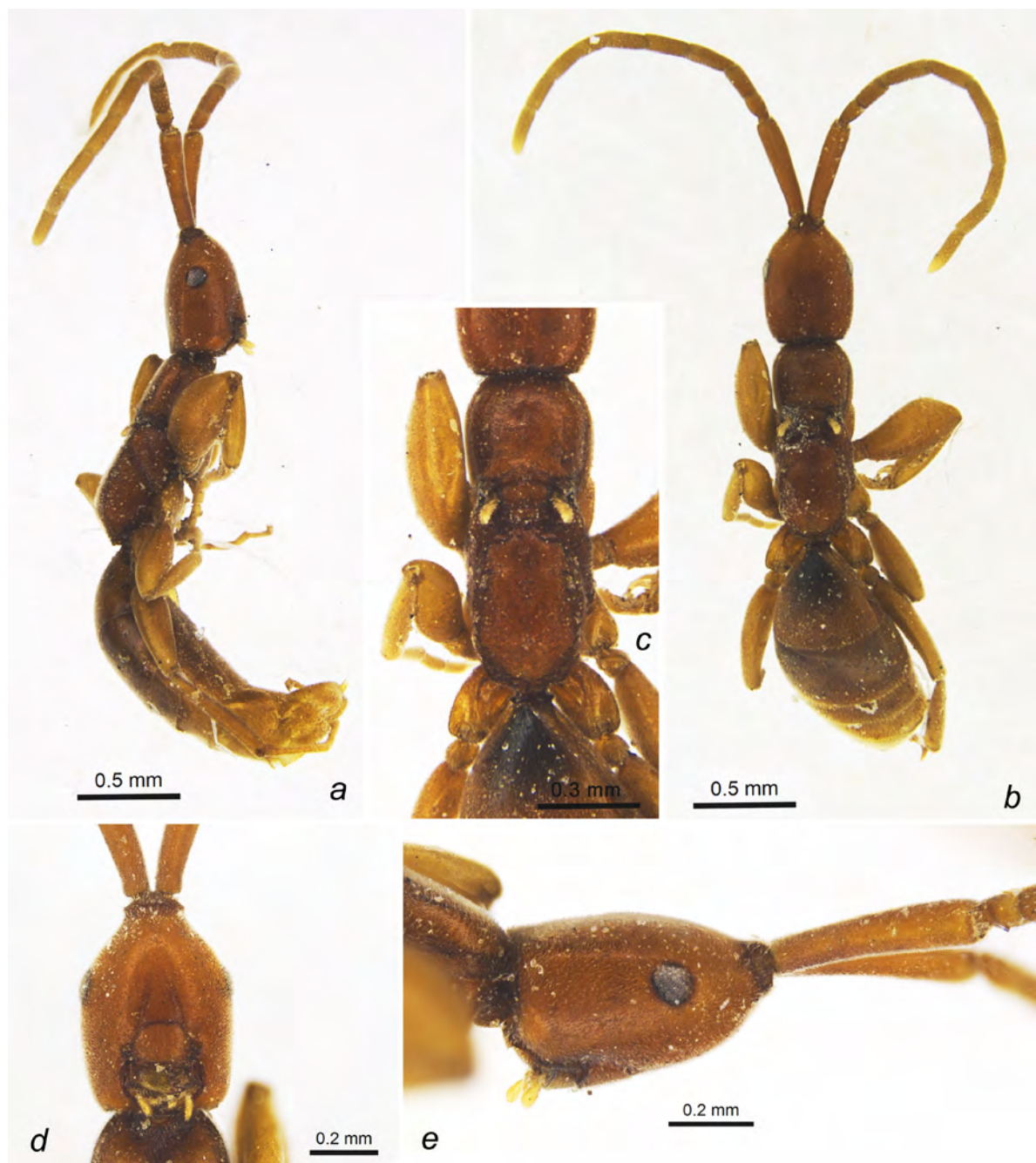


Fig. 1. *Embolemus tauricus* Olmi, Belokobylskij et Guglielmino, 2014, female, imago: *a* – body, lateral view; *b* – body, dorsal view; *c* – mesosoma, dorsal view; *d* – head, ventral view; *e* – head, lateral view.



Fig. 2. Habitat of *Embolemus tauricus* Olmi, Belokobylskij et Guglielmino, 2014 with Barber pitfall trap. The traps are marked with white arrows.

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**PHYTOSEIID MITES (PARASITIFORMES, PHYTOSEIIDAE) OF
“MYKHAYLIVS’KA TSELINA” BRANCH OF THE UKRAINIAN STEPPE
NATURE RESERVE, NAS OF UKRAINE**

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Faunistical studies are a priority in protected areas because these ecosystems can be considered the richest and the least disturbed, and provide invaluable data for comparison. It is particularly important in the case of predatory animals, such as mites of the family Phytoseiidae. They are highly important in the ecosystems as the plant pest regulators. However, the data on phytoseiid mites of protected areas are scanty, especially these of the steppe zone of Ukraine. The present publication contributes to the ecological and faunistical studies of Phytoseiidae mites of plant associations in the Ukrainian Steppe Nature Reserve. Herein, the new data on the species composition and distribution of predatory phytoseiid mites of the reserve's branch “Mykhaylivs'ka Tsylyna” are given. The material was collected by authors in August, 2017. A total of 677 specimens were identified as belonging to 14 species of eight genera of Phytoseiidae. According to the ecological preferences, the mites represent three groups: herbabionts, arboreal mites and eurybionts. The most common species was *Amblydromella pirianykae*, according to occurrence index (with maximum index value of 41.29 %). This species also was the most prevalent by the number of collected specimens. The rarest species in the studied complex were *Bawus subsoleiger*, *Neoseiulus bicaudus*, and *Typhlodromus rodovae*. The value of occurrence index for those species was 0.65%. Other species were characterized by intermediate values of occurrence index. The domination structure of the studied species complex was characterized using Paliy-Kovnatsky index. The community structure was as follows: two eudominant and two dominant species, no subdominant species, and 10 secondary community members.

Key words: Phytoseiidae, phytoseiid mites, species composition, Mikhailovskaya tselina, Ukraine.

Кліщі-фітосеїди (Parasitiformes, Phytoseiidae) відділення «Михайлівська цілина» Українського степового природного заповідника НАН України

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Отримано перші відомості про видовий склад і розподіл кліщів-фітосеїд (Parasitiformes, Phytoseiidae) в рослинних асоціаціях відділення “Михайлівська цілина” Українського степового природного заповідника. Виявлено 14 видів з 8 родів родини. Встановлено видовий склад кліщів-фітосеїд на заповідній території та за її межами, їх трапляння та приуроченість до певних типів рослинності, виконаний аналіз отриманих даних.

Ключові слова: Phytoseiidae, кліщі-фітосеїди, видовий склад, Михайлівська цілина, Україна.

Клещи-фитосейиды (Parasitiformes, Phytoseiidae) отделения «Михайловская Целина» Украинского степного природного заповедника НАН Украины

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Получены первые сведения о видовом составе и распределении клещей-фитосейид (Parasitiformes, Phytoseiidae) в растительных ассоциациях отделения “Михайловская целина” Украинского степного природного заповедника. Вывявлено 14 видов из 8 родов семейства. Установлены видовой состав клещей фитосейид на заповедной территории и за ее пределами, их встречаемость и приуроченность к определенным типам растительности, выполнен анализ полученных данных.

Ключевые слова: Phytoseiidae, клещи-фитосейиды, видовой состав, Михайловская целина, Украина.

Introduction

In stable ecosystems, mites of the family Phytoseiidae function as plant pest regulators. Thus, faunistical surveys at nature conservation territories, which are untouched by humans, produce etalon data for comparisons with findings obtained in disturbed ecosystems. Recently, several ecological-faunistical works were published on phytoseiid mites of nature conservation territories in the steppe zone of Ukraine (Kolodochka, 2004; Kolodochka, 2011; Kolodochka, Bondarenko, 1993; Kolodochka and Omeri, 2006; Kolodochka and Bondarev, 2013; 2016; Bondarev, 2018, Kolodochka and Bondarev, 2017). The current publication adds to the body of literature on mites of plant associations of Ukrainian nature conservation territories. It presents new data on the species composition and distribution of predatory mites of the family Phytoseiidae living on plants of the Ukrainian Steppe Nature Reserve, in the branch “Mykhaylivska Tsylyna”, Sumy region, Ukraine.

Material and methods

Material used in this publication was collected by authors in the Ukrainian Steppe Nature Reserve “Mykhaylivska Tsylyna” in August 2017. Mites were gathered by shaking off plants on black paper, fixed in 70 % ethanol, and later mounted on permanent slides in Hoyer’s liquid. Altogether 60 plants species were examined, 157 samples were collected, and 677 phytoseiid specimens were found. Occurrence index (P_1 , %) was calculated according to Chernov, 1975. Domination structure of the mite community was characterized with Paliy-Kovnatsky index. All species were then evaluated according to Shitikov et al., 2003 in one of four ranks: eudominant (the most common species), dominant, subdominant species and secondary member of community (the rarest species). All statistical processing was carried out using Ms Excel software.

Research results and discussion

In total, 14 species of eight genera of Phytoseiidae mites were identified in the material collected in the “Mykhaylivska Tsylyna” branch of the Ukrainian Steppe Nature Reserve.

The species are listed below (the procedure for compiling a list of species names is adopted according to Kolodochka, 2006).

Amblyseius rademacheri (Dosse, 1958) populates *Arctium lappa*.

Neoseiulus astutus (Beglarov, 1960) was found on *Salix alba*.

Neoseiulus bicaudus (Wainstein, 1962) was detected on *Aster* sp., *Calamagrostis* sp., *Arctium lappa*, *Phragmites australis*, *Cichorium intybus*.

Neoseiulus reductus (Wainstein, 1962) populates *Cirsium* sp., *Origanum vulgare*, *Phlomis pungens*, *Acer saccharum*, *Lamium album*, *Urtica dioica*, *Arctium lappa*, *Rubus idaeus*, *Echinops sphaerocephalus*, *Symphytum* sp., *Clinopodium* sp., *Leonurus* sp., *Agrimonia eupatoria*, *Phragmites australis*, *Cichorium intybus*, *Stachys* sp., *Salvia tesquicola*, *Malus* sp., *Lamium* sp.

Euseius finlandicus (Oudemans, 1915) was detected on *Aster* sp., *Betula* sp., *Crataegus* sp., *Sambucus nigra*, *Centaurea* sp., *Quercus robur*, *Origanum vulgare*, *Salix alba*, *Salix elaeagnos*, *Caragana* sp., *Acer platanoides*, *Acer tataricum*, *Urtica dioica*, *Corylus avellana*, *Tilia cordata*, *Arctium lappa*, *Symphytum* sp., *Juglans cinerea*, *Plantago major*, *Artemisia absinthium*, *Leonurus* sp., *Agrimonia eupatoria*, *Cornus alba*, *Prunus* sp., *Prunus spinosa*, *Prunus domestica* subsp. *insititia*, *Achillea millefolium*, *Cichorium intybus*, *Prunus padus*, *Stachys* sp., *Malus* sp., *Fraxinus excelsior*.

Kampimodromus aberrans (Oudemans, 1930) was assembled with *Juglans cinerea*, *Malus* sp.

Dubininellus echinus (Wainstein et Arutunjan, 1970) was found on *Betula* sp., *Phlomis pungens*, *Salix elaeagnos*, *Acer saccharum*, *Urtica dioica*, *Arctium lappa*, *Artemisia absinthium*, *Agrimonia eupatoria*, *Prunus spinosa*, *Achillea millefolium*, *Cytisus* sp., *Cichorium intybus*, *Malus* sp., *Fraxinus excelsior*.

Dubininellus juvenis (Wainstein et Arutunjan, 1970) was detected on *Salix myrtilloides*, *Rubus idaeus*, *Salix elaeagnos*, *Arctium lappa*.

Bawus subsoleiger (Wainstein, 1962) was found on *Pinus sylvestris*.

Amblydromella (s. str.) *pirianycae* (Wainstein, 1972) populates *Aster* sp., *Cirsium* sp., *Centaurea* sp., *Inula britannica*, *Origanum vulgare*, *Phlomis tuberosa*, *Phlomis pungens*, *Odontites vulgaris*, *Salix elaeagnos*, *Caragana* sp., *Verbascum thapsus*, *Lamium album*, *Urtica dioica*, *Senecio vulgaris*, *Calamagrostis epigeios*, *Arctium lappa*, *Echinops sphaerocephalus*, *Daucus carota*, *Juglans cinerea*, *Oenothera biennis*, *Artemisia absinthium*, *Leonurus* sp., *Agrimonia eupatoria*, *Eryngium* sp., *Prunus spinosa*, *Achillea millefolium*, *Cytisus* sp., *Cichorium intybus*, *Stachys* sp., *Salvia tesquicola*.

Amblydromella (*Litoseia*) *spectata* (Kolodochka, 1992) was found on *Phragmites australis*.

Amblydromella (*Aphanoseia*) *verrucosa* (Wainstein, 1972) populates *Corylus avellana*, *Pinus sylvestris*.

Typhlodromus cotoneastri Wainstein, 1961 was identified on *Gleditsia triacanthos*, *Quercus robur*, *Fraxinus excelsior*.

Typhlodromus rodovae Wainstein et Arutunjan, 1968 was found on *Pinus sylvestris*.

The species list of phytoseiid mites recorded at “Mykhaylivs’ka tselina” Reserve was compared with lists of other protected areas of different natural zones. In the result, the greatest similarity was observed with the reserves of the forest-steppe zone.

Thus, despite the fact that “Mykhaylivs’ka tselina” is a protected area with steppe vegetation, mainly the forest-steppe species of predatory mite family Phytoseiidae are registered here (Kolodochka, 2011).

According to the type of habitat, the identified phytoseiid mites can be divided into three ecological groups: inhabitants of herbaceous plants (3 species), inhabitants of tree-shrub vegetation (6 species) and the eurybionts. The latter group includes remaining 5 mites species, which do not give preference to a certain type of vegetation. It should be noted that the degree of biotopic confinement to life forms of plants is different (Table 1). Such a gradation makes it possible to speak more objectively

Table 1

Phytoseiid mites on the types of life forms of plants and the frequency of their occurrence in the “Mykhaylivs’ka tselina” branch of the Ukrainian Steppe Nature Reserve

Mite species	Life forms of plants	
	Herbs	Trees and shrubs
<i>Amblyseius rademacheri</i>	+	—
<i>Neoseiulus astutus</i>	—	+
<i>N. bicaudus</i>	+	—
<i>N. reductus</i>	++	+
<i>Euseius finlandicus</i>	++	+++
<i>Kampimodromus aberrans</i>	—	++
<i>Dubininellus echinus</i>	++	++
<i>D. juvenis</i>	+	+
<i>Bawus subsoleiger</i>	—	+
<i>Amblydromella pirianycae</i>	+++	+
<i>A. spectata</i>	+	—
<i>A. verrucosa</i>	—	+
<i>Typhlodromus cotoneastri</i>	—	++
<i>T. rodovae</i>	—	+

+ — rare (1–9 specimens); ++ — common (10–99 specimens); +++ — frequent (over 99 specimens)

about the preference of a particular species over various life forms of plants.

Maximum value of occurrence index, $P_1 = 41.29\%$, was recorded for *A. pirianykae*. This species was also most prevalent in the studied sample by the number of collected specimens. In contrast, *Bawus subsoleiger*, *Neoseiulus bicaudus*, *Typhlodromus rodovae* were represented only by one specimen each and thus were the rarest species at the studied territory. For those species, P_1 equaled to only 0.65%. For other species that we've found, intermediate values of occurrence index were observed (Fig. 1).

Domination structure of the studied species complex of phytoseiid mites in the examined plant associations was as follows. Only three of four ranks of domination were filled, with two eudominant, two dominant species and 10 secondary members of community. No subdominant species were found. The domination structure of the studied complex of phytoseiid mites in "Mykhaylivs'ka Tsylyna" department is given in Table 2.

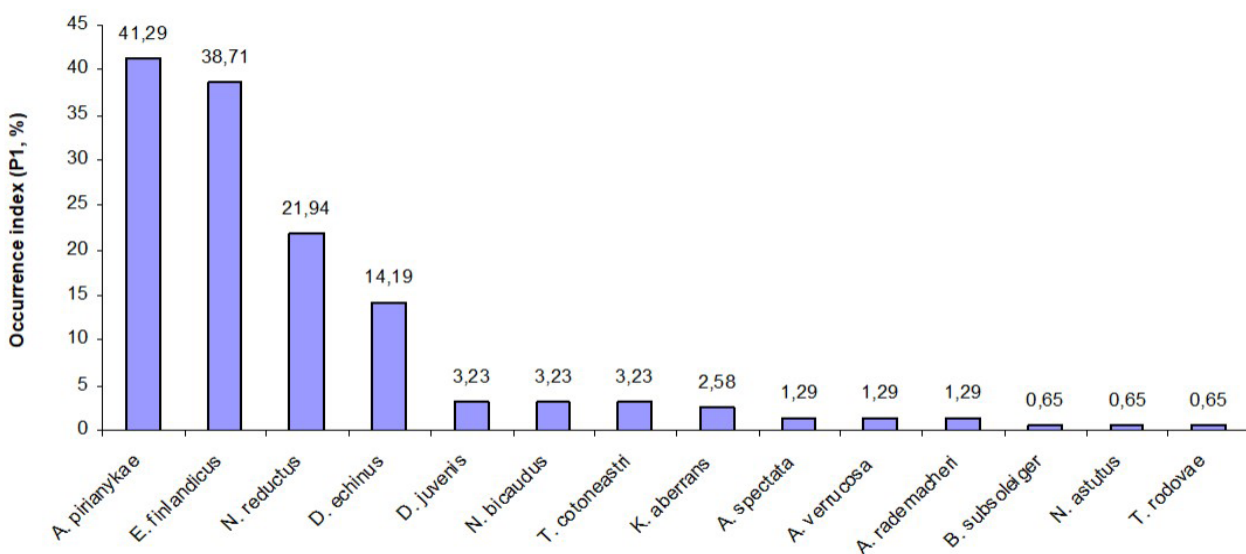


Fig. 1. Occurrence of phytoseiid mites on plants of the "Mykhaylivs'ka tselina"

Conclusion

For the first time at the territory of "Mykhaylivs'ka Tsylyna" department of the Ukrainian Steppe Nature Reserve, 14 species of mites were found that belong to eight genera of the family Phytoseiidae. The found taxa represented three ecological groups: herbabionts (three species), arboreal (six species) and eurytopic mites (five species). The most common species was a herbabiont *Amblydromella* (s. str.) *pirianykae* ($P_1, \% = 41.29\%$), the rarest species were *B. subsoleiger*, *N. bicaudus*, and *T. rodovae* ($P_1, \% = 0.65\%$), according to the occurrence index. The domination structure of studied complex of Phytoseiidae in examined plant associations included two eudominant and two dominant species, and 10 secondary members of community. Notably, there were no subdominant species.

Table 2

Status and dominance degree (in brackets) of phytoseiid mite species on plants of the "Mykhaylivs'ka tselina" branch of the Ukrainian Steppe Nature Reserve

Eudominant	<i>E. finlandicus</i> (13,32), <i>A. pirianykae</i> (11,7)
Dominant	<i>N. reductus</i> (4,21), <i>D. echinus</i> (1,11)
Subdominants of I order	Absent
Secondary members of community	<i>D. juvenis</i> (0,07), <i>K. aberrans</i> (0,05), <i>T. cotoneastri</i> (0,05), <i>N. bicaudus</i> (0,02), <i>A. rademacheri</i> (0,01), <i>A. spectata</i> (0,004), <i>A. verrucosa</i> (0,004), <i>N. astutus</i> (0,002), <i>B. subsoleiger</i> (0,001), <i>T. rodovae</i> (0,001)

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