Zoodiversity, **57**(3): 191–214, 2023
DOI 10.15407/zoo2023.03.191

UDC 595.4(477)

THE PREDATORY MITES (PHYTOSEIIDAE, PARASITIFORMES) IN THE FAUNA OF UKRAINE: A REVIEW WITH A KEY TO SPECIES AND NEW COMBINATIONS IN THE GENUS *TRANSEIUS*

L. A. Kolodochka

Schmalhausen Institute of Zoology NAS of Ukraine,
vul. B. Khmelnitskogo, 15, Kyiv, 01054 Ukraine
E-mail: leonsponsor@gmail.com

L. A. Kolodochka (http://orcid.org/0000-0002-2626-0463)

urn:lsid:zoobank.org:pub:0DF130DB-45F9-423F-A95B-489147F5BA79

The Predatory Mites (Parasitiformes, Phytoseiidae) in the Fauna of Ukraine: a Review with a Key to Species and New Combinations in the Genus *Transeius*. Kolodochka, L. A. — Nine species of the genus *Transeius* Chant & McMurtry, 2004 found on various plants during the last four decades in Ukraine are keyed, redescribed and illustrated. Three new combinations are established: *Transeius lutezhicus* (Wainstein, 1972) **comb. n**. (= *Amblyseius lutezhicus* Wainstein, 1972), *Transeius masseei* (Nesbitt, 1951) **comb. n**. (= *Typhlodromus masseei* Nesbitt, 1951) та *Transeius montanus* (Wainstein, 1962) **comb. n.** (= *Amblyseius montanus* Wainstein, 1962). Data on distribution in the world and Ukraine, habitats, assessment of abundance and occurrence are summarized.
Key words: phytoseiid mites, taxonomy, diagnoses, keys, distribution.

Introduction

Predatory mites of the family Phytoseiidae (Parasitiformes), as natural enemies of phytophagous mites and small insects, are able, under certain conditions, to achieve complete control of pests that cause serious damage to agricultural production. At the same time, however, there are still significant gaps in our knowledge of these beneficial predators.

This is particularly noticeable in Europe where, against the background of outstanding achievements in the field of molecular studies of predatory mites, their ecology and applied acarology (the search for new species and increasing the effectiveness of pest control), the growth rate of knowledge about the species composition of phytoseiids in Europe is clearly lagging behind the rapid development in recent years of faunistic research in other region, for example in the tropical and subtropical zones. The recently published regional monograph on phytoseiids in Greece (Papadoulis et al., 2009) is a welcome exception to the rule. Unfortunately, in Ukraine, despite many years of study of phytoseiid mites in the region, there have not been enough significant faunistic generalisations until recently. However, the situation has begun to change, and an article on the species of the genus *Graminaseius* Chant & McMurtry has recently been published (Kolodochka, 2022).

The present publication is the result of further development of research in this direction. It largely complements and details the results of the investigations of the species composition of the genus *Transeius* Chant &

McMurtry, carried out by the author of the article in Ukraine during the last decades. A total of 9 species of this genus were found on various plants in natural and anthropogenic landscapes. Detailed descriptions of the species are accompanied by their key, line drawings, description of morphological characteristics and measurement data, differential diagnosis, information on distribution in the world and Ukraine, enumeration of habitats, assessment of abundance and frequency of occurrence. One of the results of the study is a change in the taxonomic position of three nominal species in the family system by transferring them to the genus *Transeius*.

Material and Methods

Material for the study was collected from different parts of natural zones of Ukraine on terrestrial green plantings of different types. Standard methods of collecting mites on plants in natural condition were used. The mites were collected with a wet hand needle from the surface of black paper or black polyvinyl chloride sheet, on which the mites fell after sharp blows on a branch of a tree (shrub) or herbaceous plants with lignified stems. In order to collect mites without loss from herbaceous plants without lignified stems, plants of the same botanical species were placed in the same plane, like a fan, to minimise the destruction of mites by shaking. The collected mites were preserved in 70 % ethanol. For laboratory analysis of field collections and preparation of specimens for microscopy, the mites were removed from the preservative, rinsed briefly in water and fixed on glass slides using Hoyer's liquid. In large collections, the mites were placed in one row on a slide, less often in two rows. The prepared slides were placed in a thermostat at 60 °C for 2–3 weeks until the objects were completely clear. All drawings in this paper are original. Drawings and measurements were made using a light microscope MBI-3 (LOMO), phase contrast attachment KF-4 and objectives ×20–90 with camera lucida RA-6 (LOMO), ×1.5.

The nomenclature of idiosomal setae follows Wainstein (1973) with minor modifications. Measurements are given in micrometres (μm).

Perennial field collections of mites of the family Phytoseiidae (Parasitiformes) carried out by the author in Ukraine, collections of colleagues, materials accompanying collections of other mite families, as well as random finds submitted for identification were used. Materials on the species composition of phytoseiids deposited in the Department of Acarology of the I. I. Schmalhausen Institute of Zoology, NAS of Ukraine, Kyiv, as well as those related to the study area and deposited in the memorial collection of mites by B. A. Wainstein as part of the Institute's collection were used.

Where descriptions, measurements and illustrations were obtained from non-type specimens from Ukraine, they were compared with type specimens from the B. A. Wainstein collection and, where possible, with type material from other collections. Abbreviations of material depositories are as follows:

ARRIP — All-Russian Research Institute of Phytopathology, Russian Academy of Sciences;

CNC — Canadian National Collection, Ottawa;

IZAB — Institute of Zoology of the National Academy of Sciences of Azerbaijan, Baku;

SIZK — I. I. Schmalhausen Institute of Zoology, NAS of Ukraine, Kyiv;

When there was no type material for redescriptions, species were identified from keys in publications and compared with descriptions and illustrations in articles by other authors.

Subfamily Amblyseiinae
Tribe Amblyseiini
Subtribe Amblyseiina

Genus *Transeius* Chant & McMurtry, 2004

Transeius Chant & McMurtry, 2004 a: 182.
morii species group: Ehara & Amano, 1998: 32.
Type species: ***Amblyseius bellottii*** Moraes & Mesa, 1988: 74.

Diagnosis. The genus *Transeius* was established for mites of the subtribe Amblyseiina, tribe Amblyseiini, subfamily Amblyseiinae (Phytoseiidae, Parasitiformes, Mesostigmata), which have 19 pairs of dorsal setae on the dorsal side of the body: AD1, AD2, AD3, AD4; PD2, PD4; AM1, AM2; AL1, AL3, AL4; PL1, PL2, PL3; PM1, PM3, PM4; AS, PS both outside the dorsal shield. Dorsal shield in the species occurring in Ukraine has 7 or 6 pairs of solenostomes (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*; or *iv* missing in 1 species). Only *T. proximus* lacks the *iv* pair, while the *id* pair is represented by dark spots. Female and male dorsal shield

is whole, elongated oval or broadly oval with weak lateral notches, well sclerotized, with wide dark stripe along posterolateral margins of shield, smooth or with thin shading along the edges of the shield. Dorsal setae smooth, except for slightly serrated PM3 and PM4, varying in length from short, sometimes miniature, to moderately long, but not exceeding the distance between PM4–PM4 thecae. Setae of three pairs (PM4–PM3–AL4) are always longer than other setae on the shield. Sternal shield with 3 pairs of setae. Ventrianal shield pentagonal, somewhat narrowing or widening caudally in different species, with or without shallow emarginations along lateral margins; finely cross-striated or smooth. Anal pores clear, round or absent. The chelicerae in *Transeius* species occurring in Ukraine have 3–13 teeth on Df and 1–3 on Dm. Spermatheca with funnel with thickened or thick walls, elongated or goblet-shaped; atrium sessile, from small to large, large duct solitary. Leg IV with 3 elongated macrosetae, genua III, II, sometimes leg I with or without short macrochaetae. Spermatodactyl of male L-shaped. Ventrianal shield with 3–6 pairs of preanal setae.

There are 43 nominal species in the genus *Transeius* in the world (Chant & McMurtry, 2004).

As a result of the author's long-term research on collecting, studying and describing the species composition of mites of the family Phytoseiidae, 9 species of the genus *Transeius* were found to occur in the fauna of Ukraine. The species composition of the genus in this article is taken generally follows Chant & McMurtry (2007) with modifications.

Transeius begljarovi (Abbasova, 1970) (fig. 1)

Amblyseius begljarovi Abbasova, 1970: 51; Livschitz & Kuznetsov, 1972: 23; Wainstein, 1977: 237; Begljarov, 1981: 36; Moraes et al., 1986: 9; Papadoulis & Emmanuel, 1990: 14; Papadoulis & Emmanuel, 1991: 40; Papadoulis et al., 2009: 65;
Amblyseius (Amblyseius) begljarovi: Arutunjan, 1977: 37;
Amblyseius (Multiseius) begljarovi: Denmark & Muma, 1989: 101;
Transeius begljarovi: Chant & McMurtry, 2004 a: 185; 2007: 71.

Material. **Type**. Holotype ♀, [Azerbaijan], Khachmas region, nest of *Microtus minutus*, orchard, 13.10.1962, specimen #63, (Hadzhiev) (IZAB) (not examined).

Non-type. 9 ♀, 3 ♂ (12 specimens): Ukraine, Autonomous Republic of Crimea, Karadag, Biological Station, dry stream bed, *Cornus mas*, 06.07.1975, specimen #1317a, 1 ♀, 44°54'45.0" N 35°11'55.0" E; Large Yalta, Kichkine vil., courtyard of a private house, *Cichorium* sp., 11.06.1976, specimen #2208, 3 ♀, 1 ♂, 44°31'23.0" N 34°15'44.0" E; ibid., forest nursery, glade, *Cichorium* sp., specimen #2230a, 1 ♀; cape Kazantip shore, *Carduus* sp., 14.07.1976, specimen #3403, 2 ♀, 45°28' 21.0"N 35°50'35.0" E; ibid., *Melandrium* sp., 30.05.1979, specimen #3409, 2 ♀, 1 ♂; Starokrymsky District, env. Perevalovka vil., clearing in the forest, *Ballota nigra*, 02.06 1979, specimen #3440, 1 ♂, 44°51'08.0" N 34°19'07.0" E (Kolodochka) (SIZK).

Redescription. Female. Dorsal shield (fig. 1, *1*) well sclerotized, with wide dark stripe along posterolateral margins of shield, smooth, broadly oval with distinct lateral notches, narrowed frontally; dorsal solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*). Dorsal setae smooth, varying in length. Setae PM3 and PM4 long (second noticeably twice longer), other setae varyingly shorter (up to microsetae). Setae AM1 and AL1 reach the theca next setae. Seta AL3 shorter than distance to base of seta AL4. Seta PL1 four times as long as each of PM1, PL2, and PL3 equal in length. Perithreme long, reaching base of seta AD1. Ventrianal shield wider than genital, elongated-pentagonal, widened at the level of anterior margin of anal valves, narrowed caudally, with lateral emarginations and sculpture in the form of thin transverse lines; anal pores round, spaced apart (fig. 2, *2*). The anterior metapodal shield is narrower and slightly smaller than the posterior one (fig. 3, *3*). Posterior part of peritremal shield slightly curved, beak-shaped (fig. 4, *4*). Chelicera with 8–9 teeth on Df and with 3 on

Fig. 1. *Transeius begljarovi* (Abbasova, 1970), ♀ (*1–7*), ♂ (*8*, *9*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV; *8* — ventrianal shield; *9* — chelicerae with spermatodactil.

Dm (fig. 4, *5*). The funnel of the spermatheca is long, conical, widening towards the sacculus; its narrow part adjacent to the massive atrium is steeply curved (fig. 4, *6*). Leg IV with 3 macrosetae: almost equal in length on basitarsus and genu, somewhat shorter on tibia (fig. 4, 7); on the genu and tibia III, and on the genu II short macrosete also present.

Measurements: Lds 390, Wds 225; Lvas 116, Wvas 97, Lian 54; Ltar IV 117; setae length: AD1 27; AD2 7; AD3 7; AD4 7; PD2 8; PD4 9; AM1 36; AM2 7; AL1 23; AL3 36; AL4 52; PL1 36; PL2 9; PL3 9; PM1 9; PM3 77; PM4 140; AS 27; PS 17; PV 72; MCh IV: ge 57, ti 38, ta 56; MCh III: ge 25; MCh II: ge 25.

Male. Ventrianal shield with three pairs of setae; anal pores round (fig. 4, *8*). Spermatodactyl L-shaped (fig. 4, *9*). Lds 300.

Diagnosis. According to the dorsal pattern of setae, *T. begljarovi* is similar to *A. andersoni* (Chant) and *A. similis* (Koch), distinctly differing from them in stronger sclerotization of idiosomal shields, peculiar structure and shape of the cone-shaped spermatheca, and round, widely spaced anal pores, whereas in *A. andersoni* and *A. similis*, the spermatheca is cup-shaped, the anal pores are slit-like and shifted.

Distribution, habitat, occurrence. Europe, the Middle East, Azerbaijan. In Ukraine: Autonomous Republic of Crimea, shrubs, herbs; ordinary.

Note. Description, dimensions and illustrations are given for non-type specimens from the Crimea after comparing them with specimens from SIZK collection as well as on illustrations of this species in literary publications.

Transeius fragilis (Kolodochka & Bondarenko, 1993) (fig. 2)

Amblyseius fragilis Kolodochka & Bondarenko, 1993: 34.
Typhlodromips fragilis: Moraes et al., 2004: 213; Chant & McMurtry, 2004: 187; 2007: 71; Kreiter et al., 2020: 212.

Material. **Type**. Holotype ♀, Ukraine, Kherson Region, the Black Sea Biosphere Reserve, Solenoozerny site, steppe near cordon, *Taraxacum* sp., 14.06.1992, specimen #5379 /L219, 46°27'33.0" N 32°07'10.0" E (Bondarenko); paratypes: 2 ♀, Yagorlytsky Kut site, fescue-wormwood steppe, halimion medow, *Frankenia hirsuta*, 28.05.1991, specimens #5275, 46°29'25.0" N 31°41'25.0" E; 1 ♀, idem., steppe near the cordon, *Cirsium* sp., 28.05.1991, specimens #5280; 3 ♀, idem., same date, specimens #5281 (Kolodochka) (SIZK).

Non-type. Kherson Region, Arabat Spit, near Volok, steppe area, *Echium* sp., 06.06.1979, specimen #3467, 45°31'14.0" N 35°14'13.0", 1 ♀(Kolodochka) (SIZK).

Redescription. Female. Dorsal shield (fig. 2, *1*) weakly sclerotized, smooth, elongated–ovate, with almost parallel lateral margins, 7 pairs of solenostomes (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*). Dorsal setae sharp, smooth, short or moderately long, except for somewhat elongate AM1 and AL3, as well elongated and serrate PM3 and PM4. Seta AM1 reach but do not extend beyond theca of seta AL1. Seta AL1 longer than seta AL3. Seta PL1 twice as long as PL2 and 2.5 times longer than PL3. Seta PM3 shorter than PM4. Peritreme almost reaching the theca of seta AD1. Ventrianal shield (fig. 2, *2*) pentagonal, wider than genital one, with small lateral emarginations, bearing three pairs of preanal setae, no anal pores. Posterior metapodal shield elongated oval, approximately as long as narrow anterior one (fig. 2, *3*). Posterior part of peritremal shield slightly curved, beak-shaped at end, with pore (fig. 2, *4*). Chelicera on Df with 4 teeth (3 distal and 1 basal), on Dm with 1 (fig. 2, *5*). Spermatheca with elongated thick-walled funnel; the atrium is massive and immersed in the base of the funnel (fig. 2, *6*). Leg IV with 3 sharp macrosetae: the longest on basitarsus (fig. 2, *7*). Genua of III and II legs also with one short sharp macroseta.

Measurements: Lds 390, Wds 215; Lvas 130, Wvas max 97; Ltar IV 134; setae length: AD1 26; AD2 9; AD3 9; AD4 12; PD2 9; PD4 10; AM1 34; AM2 6; AL1 23; AL3 18; AL4 49, PL1 36; PL2 22; PL3 14; PM1 15; PM3 56; PM4 85; AS 22; PS 17; PV 65. MCh IV: ge 56, ti 44, ta 82; MCh III: ge 32; MCh II: ge 22.

Male unknown.

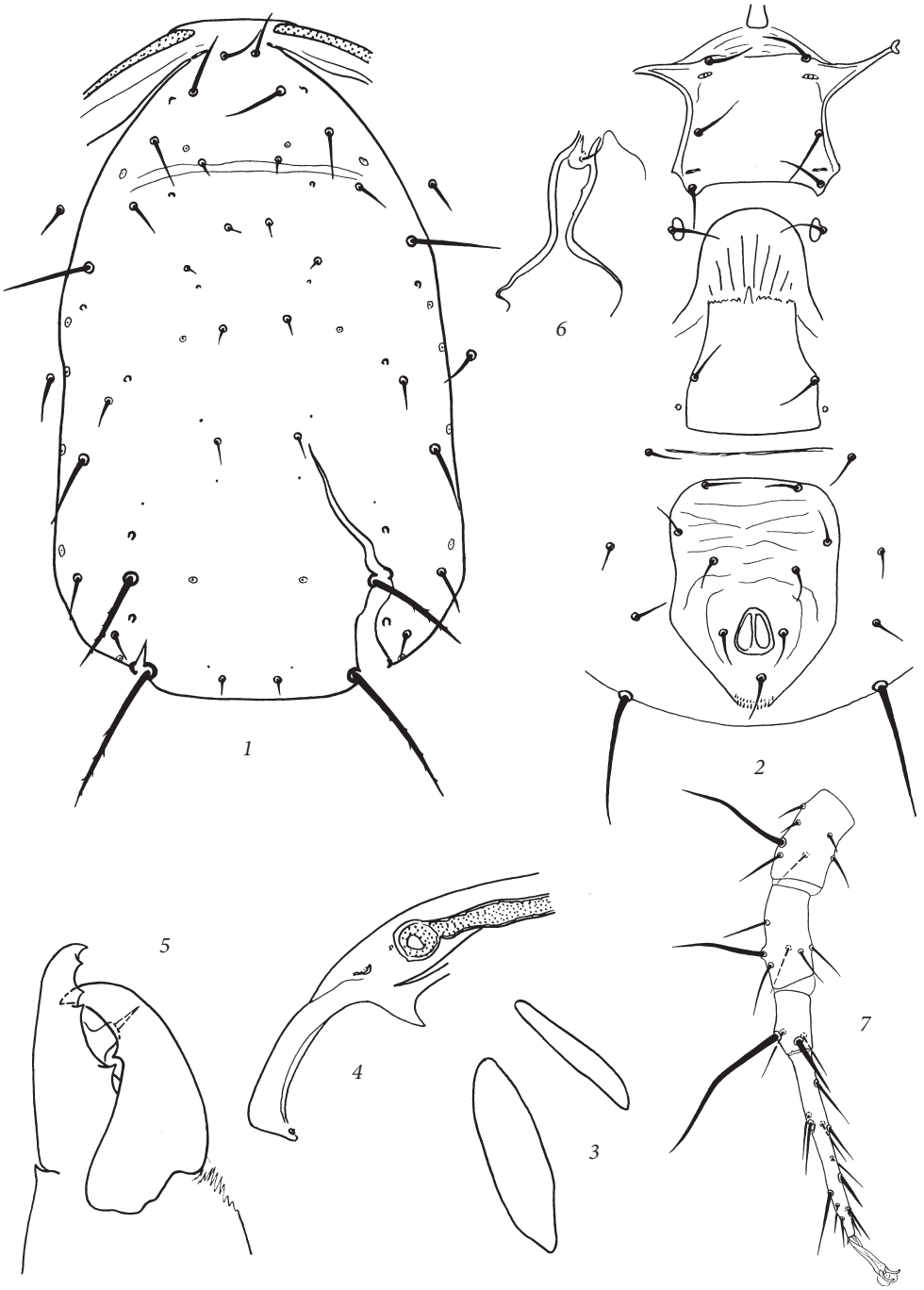

Fig. 2. *Transeius fragilis* (Kolodochka et Bondarenko, 1993), ♀ (*1–7*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal schield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV.

Diagnosis. Very similar to *T. herbarius* Wainstein, from which it is easily distinguished by the shape of a larger and elongated spermatheca; the number of teeth on the chelicera digits (in *T. fragilis* 4 teeth on Df, and 1 on Dm, but in *T. herbarius* 6 and 2, respectively); the presence of a basal tooth on Df (the basal tooth is absent in *T. herbarius*); noticeably more long PL2, PM4, and PV (22, 85, and 65 versus 14, 70, and 47 in *T. herbarius*, respectively).

Distribution, habitat, occurrence. Europe (Slovenia, Ukraine). In Ukraine it is known only from steppe biotopes, herbs; rare.

Note. Description, illustrations, and measurements are based on the holotype.

Transeius herbarius (Wainstein, 1960) (fig. 3)

Typhlodromus herbarius Wainstein, 1960: 687; Hirschmann, 1962: 225;
Amblyseius (Amblyseius) herbarius: Ehara, 1966: 14;
Amblyseius herbarius: Kolodochka, 1973: 80; 1974 a: 88; 1978: 40; Arutunjan, 1977: 35; Wainstein, 1977: 236; Begljarov, 1981: 33, 74; Kolodochka & Omeri, 2011: 44;
Neoseiulus herbarius: Moraes et al., 1986: 82;
Transeius herbarius: Chant & McMurtry, 2007: 71; Faraji et al., 2011: 223.

Material. **Type**. Syntypes: 1 ♀, Kazakhstan, Astana, state farm, [leaf] litter, <under> raspberry, 18.08.1955, specimen #1015; 3 ♀, Almaty, Kargalinka, base of Plant Protection Station, on *Agrimonia* sp., 19.04.1956, specimen #1368; 2 ♀, ibid., *Carduus* sp., 04.05.1956, specimen #1422; 3 ♀, ibid., same data, specimen #1421 (SIZK; B.A. Wainstein's collection).

Non-type. 63 ♀, 9 ♂ (72 specimens): Ukraine, AR Crimea, Donetsk, Cherkasy, Chernihiv, Kherson, Kyiv, Luhansk, Rivne, Vinnytsia, Zhytomyr Region (SIZK).

Redescription. Female. Dorsal shield (fig. 3, *1*) well sclerotized, mostly smooth, sometimes barely perceptibly reticulate, with slight lateral emarginations. Dorsal setae sharp, vary in length; solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*). Setae PM3 and PM4 slightly serrated, rest smooth. Seta AM1 as long as distance to the theca of seta AL1 or slightly longer. Seta AL1 somewhat (3 μm) longer than AL3. Seta PL1 more than twice as long as setae PL2 and PL3. The peritreme do not extend beyond the level of the theca of seta AD1. Ventrianal shield with slight lateral emarginations, transversely striated; anal pores missing (fig. 3, *2*). The posterior metapodal shield is fusiform, the anterior one is narrower and shorter nearly 1.5 times (fig. 3, *3*). Posterior part of peritremal shield curved, pointed (fig. 3, *4*). Chelicera on Df with 6 teeth and on Dm with 2 (fig. 3, *5*). The spermatheca is small, with thick wall of the funnel, thinning towards the sacculus; the massive atrium immersed into base of the funnel (fig. 3, *6*). Leg IV with 3 macrosetae: the longest on the tarsus (fig. 3, 7). Genu and tibia III, genu and tibia II, as well genu I with one small macroseta.

Measurements: Lds 350, Wds 190, Lvas 128, Wvas 97, Ltar IV 131; setae length: AD1 25; AD2 7; AD3 8; AD4 11; PD2 11; PD4 8; AM1 33; AM2 7; AL1 25; AL3 22; AL4 45; PL1 36; PL2 14; PL3 14; PM1 14; PM3 50; PM4 70; AS 22; PS 19; PV 47; MCh IV: ge 47, ti 36, ta 78; MCh III: ge 23, ti 23, MCh II: ge 23, ti 23; MCh I: ge 30.

Male. Preanal setae 5 pairs; anal pores missing (fig. 3, *6*). The spermatodactyl is curved (fig. 3, *7*). Lds 305.

Diagnosis. *Transeius herbarius* is very similar to *T. fragilis* (Kolodochka & Bondarenko) reliably differing from *T. fragilis* by short and thick wall funnel of spermatheca, more than 6 teeth on Df and on 2 on Dm (in *T. fragilis*, only 4 teeth on Df and 1 on Dm; the basal tooth on Df missing), and dorsal setae PL2, PM4, and PV shorter (14, 70, and 47 in *T. herbarius*, and 22, 85, and 65 in *T. fragilis*, respectively).

Distribution, habitat, occurrence. Europe, the Caucasus, the Middle East. Ukraine: steppe zone, forests-teppe zone, forest zone (Polissia), Crimea (second ridge of mountains), confined to herbaceous plants; common species.

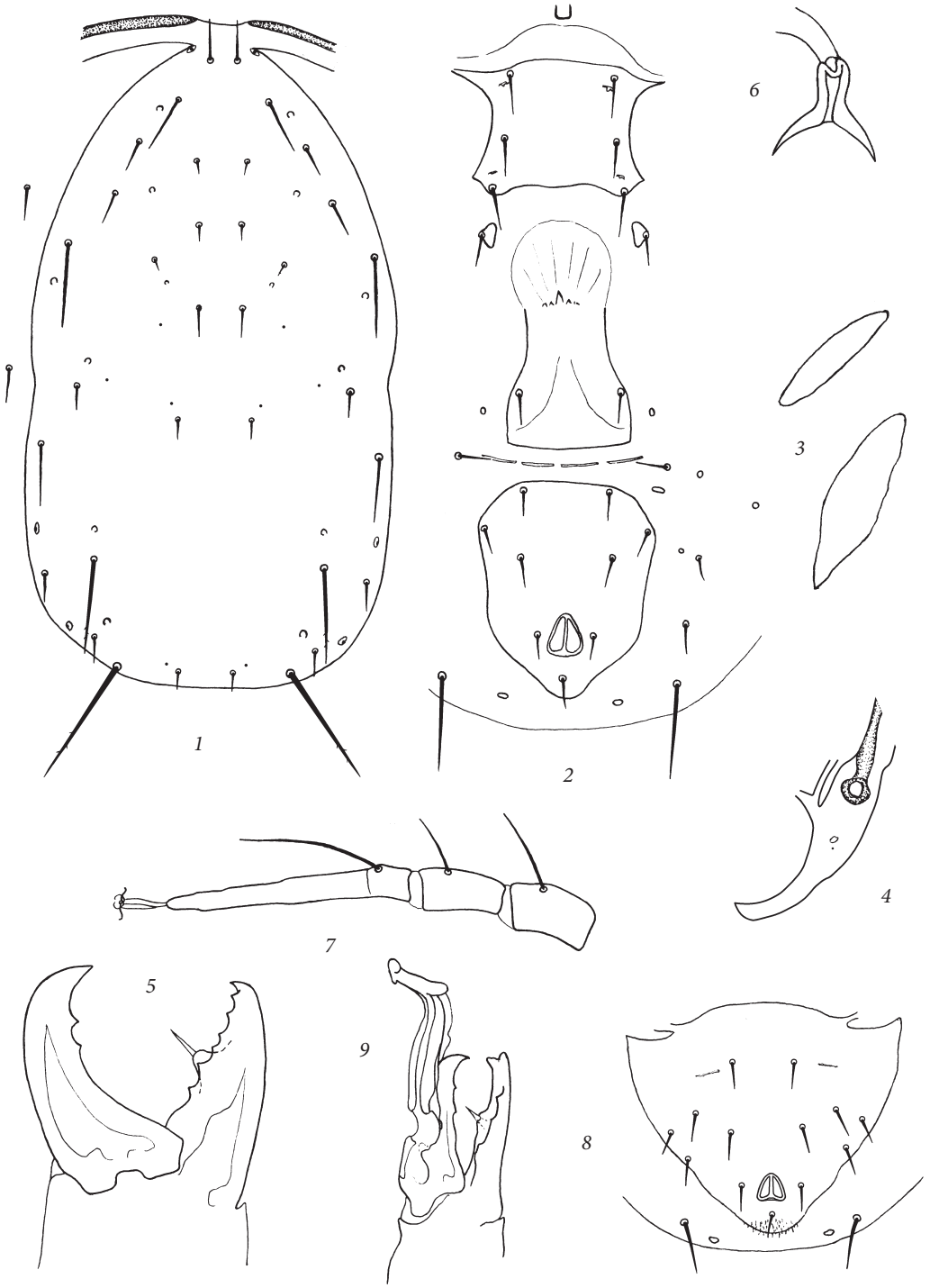

Fig. 3. *Transeius herbarius* (Wainstein, 1960), ♀ (*1–7*), ♂ (*8*, *9*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV (macrosetae shown only); *8* — ventrianal shield; *9* — chelicerae with spermatodactil.

Notes 1. Four of the 16 *T. herbarius* syntypes accessions that Dr. Wainstein dealt with were studied (listed above). Specimens #1422 (2 ♀), and #1423 (3 ♀) dried up and could not be studied. The rest of the specimens are missing from the collection.

2. Description, dimensions and illustrations are based on better preserved non-type specimens from Kyiv Region.

3. As has been previously established, *T. herbarius* mites reproduce under laboratory conditions in the manner of thelytoky (Kolodochka, 1974), i. e. only females develop from unfertilised eggs. Males are either unknown (obligate parthenogenesis) or appear under certain conditions (facultative parthenogenesis).

Subsequently, the study of earlier collections showed that *T. herbarius* may be reproduce in a bisexual manner under natural conditions, which is common to most phytoseiids (Kolodochka, 1984 a, b). Because of the rarity of male specimens, the localities where they were collected are listed here: Kyiv, wasteland near the biological laboratory of the Kyiv State University [50°23'05.0" N 30°28'33.0" E], *Arctium* sp., 08.07 1972, specimen #994, 2 ♀, 1 ♂; ibid., same host under a solitary apple tree, 18.08 1970, specimen #1170, 8 ♀, 3 ♂.

Later, males of *N. herbarius* were discovered as well in the material of field collections during two expeditions: in Ukraine: Crimea, Tarkhankut Peninsula, 7 km W from the vil. Chernomorskoe, *Echium* sp., relic steppe territory, 23.05.1979, specimen #3359 b, 1 ♂. Beyond Ukraine — Moldova: Calarash, private garden, *Arctium* sp., 10.07.1978, specimen #2992, 1 ♂; ibid., *Cichorium* sp., 10.07.1978, specimen #2994a, 6 ♀ 1 ♂, specimen #2994b, 7 ♀, 1 ♂ (Kolodochka).

For unclear reasons, this line of research has not yet attracted much attention from scientists involved in the search for effective predators for plant protection and has not been further developed. At the same time, it can be very useful in solving not only purely theoretical problems, but also have practical application in the development of new directions in the development of biological methods to protect plants from pests. An important fact is that the population growth of parthenogenetic predator species occurs with the full realisation of the generative potential of females, without the need to spend a significant part of it on the reproduction of males. If we consider that males can make up about a third of the individuals in a population (our own data) and that the rate of pest destruction becomes a decisive factor in the choice of the appropriate method of plant protection, parthenogenetic species gain a significant advantage over species with a bisexual mode of reproduction.

Transeius jailensis (Kolodochka, 1981) (fig. 4)

Amblyseius jailensis Kolodochka, 1981: 20; Moraes et al., 1986: 17;
Transeius jailensis: Chant & McMurtry, 2007: 71;
Typhlodromips jailensis: Denmark & Evans, 2019: 90.

Material. **Type**. Holotype ♀, Ukraine, AR Crimea, env. Yalta, Nikitskaya Yayla (alpine meadows), Krasnyy Kamen', 1350 m a. s. l., herbaceous plants *Alchemilla tittantha*, 22.06.1976, specimen #2160, 44°30'55.0" N 34°05'47.0" E; paratype ("allotype") ♂ (No 1), ibid., on *Plantago* sp., same date, specimen #2163 (Kolodochka) (SIZK).

Non-type. 242 ♀, 9 ♂ (251 specimens), very commonly in the Crimean Mountains on various herbaceous plants growing on the yaila and in the upper part of the forest edge (1300–1400 m a. s. l.) (Kolodochka). Solitary specimens of this species have been found outside its high-altitude locations: South-Eastern Crimea, Karadag mountain range, Tumanova Balka, topsoil, 28.07.1980, specimen #3699-1 (S–219), 1♀, 44°55'20" N 35°12'34" E; ibid., oak-pistachio forest on the N slope, humus, 17.06.1975, specimen # 3700-5 (S–225), 17.06.1975, 1 ♀; ibid., soil at roots of *Pistacia mutica*, the same data, specimen #2091-1 (S–305), 2 ♀; ibid., same date, specimen #2092 (S–307), 1 ♂ (G. Shcherbak); West Crimea, Tarkhankut Peninsula, Chernomorsky District, tract Crolichya Balka, north of the Olenivka village, <dry steppe>, *Senecio* sp., 24.05.1979, specimen #3365, 1 ♀ 45°23'56" N 32°33'02" E (Kolodochka) (SIZK).

Fig. 4. *Transeius jailensis* (Kolodochka, 1981), ♀ (*1–7*), ♂ (*8*, *9*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV (macrosetae shown only); *8* — ventrianal shield; *9* — chelicerae with spermatodactil.

Redescription. Female. The dorsal shield (fig. 4, *1*) well sclerotized, with a dark wide border along the posterolateral margins of the shield, smooth, elongate-oval in form, with small lateral emarginations, covered with a slight oblique striation along the anterior-lateral margins; solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*), of which *is* and *ic* relatively large, the rest are small. Peritreme reaches the theca of seta AD1. All dorsal setae smooth. Seta AM1 almost reaches the theca of seta AL1. Setae of row AL do not reach the next setae. Seta AL2 slightly shifted medially with respect to arc of row AL. Seta AL3 about 1.5 times as long as AL2 and more than twice as long as AL3. Setae PM1, PL2, and PL3 of equal length. Seta PL1 three times as long as each of them. Seta PM3 longer than distance to theca PL3. Ventrianal shield wider than genital, well sclerotized, with concave anterior and lateral margins, caudally widened; anal pores small, round, not shifted (fig. 4, *2*). The anterior half of the shield covered with striation. The posterior metapodal scutus is larger than the narrower anterior one (fig. 4, *3*). The posterior end of the peritremal shield is widened in the region of the stigma, weakly curved in the posterior part, ending in a small coracoid process (fig. 4, *4*). Df of chelicera with 2 large distal teeth and 11 miniature teeth, Dm with 3 teeth (fig. 4, *5*). The funnel of the spermatheca is bell-shaped, with uniformly thick walls, becoming sharply thinner in the transition to the sacculus; the massive atrium asymmetrical, immersed into base of the funnel (fig. 4, *6*). There are 3 macrosetae on leg IV: the shortest on the tibia (fig. 4, *7*). Macrosetae on other legs missing.

Measurements: Lds 362, Wds 220; Lvas 125, Wvas 106, Lian 48; Ltar IV 93; setae length: AD1 21; AD2 8; AD3, AD4 7; PD2 9; PD4 12; AM1 31; AM2 7; AL1 19; AL3 26; AL4 41; PL1 29; PL2 12; PL3 11; PM1 10; PM3 62; PM4 110; AS 22; PS 16; PV 62; MCh IV: ge 41, ti 34, ta 51.

Male. Preanal setae 3 pairs; anal pores round, small (fig. 4, *8*). Spermatodactyl L-shaped (fig. 4, *9*). Lds 290.

Diagnosis. *Transeius jailensis* is similar to *T. begljarovi* Abbasova, from which it is easily distinguished by a different shape of the spermatheca, which also has a cone-shaped funnel, but much wider and not curved in the part adjacent to the atrium, as well as by the structure of the Df chelicerae with numerous small teeth (see also description of *T. begljarovi*).

Distribution, habitat, occurrence. Europe (Ukraine). In Ukraine: Crimea — mountains relief upper forest line (1300–1400 m a. s. l.), Karadag (up to 577 m a. s. l.), and steppe part (Tarkhankut Peninsula); herbaceous plants; common in the highlands, rare at low altitudes and at steppe.

Notes 1. Description, illustrations, and dimensions are based on the holotype.

2. Of great interest are single occurrences of this species far from the yayla, in landscapes of relatively low relief (Karadag) and in steppe areas (Tarkhankut).

Transeius lutezhicus (Wainstein, 1972), comb. n. (fig. 5)

Amblyseius lutezhicus Wainstein, 1972: 1408; Begljarov, 1981: 35; Karg, 1993: 185;
Amblyseius (Amblyseius) lutezhicus: Wainstein, 1977 b: 236; Arutunjan, 1977: 36;
Typhlodromips lutezhicus: Moraes et al., 1986: 143; Denmark & Evans, 2019: 309.

Material. **Type**. Holotype ♀, [Ukraine, Kyiv Region], Lyutizh, soil with grass under a rotting pine trunk, 09.23 1968, specimen #3552 (177), 50°41'00.0" N 30°23'50.0" E (Pirianyk) (SIZK).

Non-type. 31 ♀, 1 ♂ (32 specimens): Ukraine, Crimea (main range of mountains; Karadag), Donetsk, Kyiv, Poltava Regions.

Fig. 5. *Transeius lutezhicus* (Wainstein, 1972), ♀ (*1*–*7*), ♂ (*8*, *9*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV; *8* — ventrianal shield; *9* — chelicerae with spermatodactil.

Redescription. Female. Dorsal shield (fig. 5, *1*) well sclerotized, ovoid, with slight lateral emarginations, smooth, oblique linear striation along shield margins; solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*). Dorsal setae pointed, contrasting in length from elongated to miniature. The longest are AL4, PM3, and PM4, of which PM3 and PM4 are serrated. Seta PL1 about twice as long as both PL2 and PL3. Ventrianal shield slightly wider than genital shield, pentagonal with nearly parallel lateral margins, anterior margin slightly convex; anal pores clearly visible, round, close together (fig. 5, *2*). Anterior metapodal scutum narrow, linear; the posterior one fusiform (fig. 5, *3*). The posterior part of the peritremal shield smoothly curved, beak-shaped at the end, with a pore on tip (fig. 5, *4*). Chelicera with 3 teeth on Df, and with 1 on Dm (fig. 5, *5*). The funnel of the spermatheca long, capable of bending in the narrowed middle part, with a wide bell at the sacculus; the atrium is immersed in the base of the funnel (fig. 5, *6*). Leg IV with 3 pointed macrosetae, the longest on the basitarsus, shortest on the tibia (fig. 5, *7*).

Measurements: Lds 330, Wds 220; Lvas 114, Wvas 107, Lian 22; Ltar IV 142; setae length: AD1 27; AD2 5; AD3 5; AD4 7; PD2 9; PD4 11; AM1 38; AM2 5; AL1 9; AL3 18; AL4 72; PL1 20; PL2 13; PL3 11; PM1 11; PM3 61; PM4 94; AS 14; PS 13; PV 54; MCh IV: ge 65, ti 40, ta 80.

Male. Ventrianal shield triangular, with 3 pairs of preanal setae and contiguous anal pores (fig. 5, *8*). The spermatodactyl curved, with a lateral process, rounded and widened at the end (fig. 5, *9*). Lds 305.

Diagnosis. *Transeius lutezhicus* reliably differs from morphologically similar species in the peculiar structure of the spermatheca with a very long funnel.

Note. The asymmetric placement of the anal pores, which was pointed out in the original description of this species, is not a reliable species trait, since it is not carry out for all individuals. The original description indicates the presence of 4–5 teeth on Df chelicerae; the specimens studied by us had 3 teeth on this finger.

Distribution, habitat, occurrence. Europe, the Caucasus. In Ukraine: herbs, litter, soil, nests of small mammals; rare.

Note. Description, dimensions and illustrations are based on non-type specimens from the Crimea, which were compared with the holotype.

Transeius masseei (Nesbitt, 1951), comb. n. (fig. 6)

Typhlodromus masseei Nesbitt, 1951: 27; Begljarov, 1958: 112;
Typhlodromus (Typhlodromus) masseei: Westerboer & Bernhard, 1963: 622;
Amblyseius (Typhlodromopsis) masseei: Muma, 1961: 287;
Amblyseius masseei: Athias–Henriot, 1966: 207; Karg, 1971: 197; Begljarov, 1981: 33;
Amblyseius maior: Karg, 1970: 297; 1971: 210; Kolodochka, 1978: 33;
Amblyseius major [sic]: Kolodochka, 1971: 79 [misspelling];
Neoseiulus maior: Moraes et al., 1986: 87;
Neoseiulus masseei: Moraes et al., 1986: 89;
Aristadromips maior: Chant & McMurtry, 2007: 60;
Aristadromips masseei: Chant & McMurtry, 2007: 60; Denmark & Evans, 2019: 309.
Amblyseius (Typhlodromips) masseei: Karg, 1993: 184 (senior synonym of *A. maior* Karg, 1970: 297).

Material. **Type**. Holotype ♀ and "allotype" ♂ (both on the same slide), specimen #5966, label: "on apple leaves (and twigs), (appears to be predaceous on *Mediolata nowae-scotiae*), Apple leaf, Drew och., Berwick, Nova Scotia, Canada, August 12 1946" — original label cited (CNC) (examined and figured).
Non-type. 241 ♀, 90 ♂ (331 specimens): Ukraine, Cherkasy, Chernihiv, Kherson, Kyiv, Lviv, Mykolaiv, Rivne, Volyn, Zhytomyr Regions.

Fig. 6. *Transeius masseei* (Nesbitt, 1951), ♀ (*1–7*), ♂ (*8*, *9*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV (macrosetae shown only); *8* — ventrianal shield; *9* — chelicerae with spermatodactil.

Redescription. Female. Dorsal shield well sclerotized, smooth, oblong-oval, with small lateral emarginations (fig. 6, *1*); distinct solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*). Seta PM4 with 4–6 serrations, PM3 with one, and other setae smooth. Seta AM1 longer than the distance from one's own theca to theca of seta AL1, which is almost equal to distance to theca AL2. Seta AL2 shorter than distance to theca of AL3. Seta AL2 slightly longer than AL1 and almost 1.5 times shorter than AL3. Setae PM1, PD1, and PS equal in length. Seta PL1 longer than both setae PL2 and PL3. Peritreme reaching theca of seta AD1. Ventrianal shield elongated pentagonal, wider in anterior part than genital, with lateral notches and slight transverse striation, bears a pair of large round, widely spaced anal pores (fig. 6, *2*). Anterior metapodal shield narrow, linear, posterior not less than 1.7 times as long as it, irregularly fusiform and wider (fig. 6, *3*). The posterior part of the peritremal shield is slightly curved, ending in a coracoid shape (fig. 6, *4*). On Df of chelicera 8 teeth, on Dm — 3 (fig. 6, *5*). Spermatheca with bell-shaped funnel, funnel walls of equal thickness up to half of its length, then gradually thinning towards sacculus; atrium sessile, large duct wide (fig. 6, *6*). Leg IV with 3 macrosetae, on genu some longer then on tibia and basitarsus (fig. 6, *7*). Genu and tibia of legs III, as well genu of legs II with one short macroseta.

Measurements: Lds 470, Wds 260, Lvas 160, Wvas 120, Lian 50, Ltar IV 140; setae length: AD1 33; AD2 15; AD3 14; AD4 18; PD2 21; PD4 12; AM1 57; AM2 13; AL1 40; AL3 47; AL4 65; PL1 56; PL2 40; PL3 36; PM1 22; PM3 71; PM4 105; AS 20; PS 22; PV 57; MCh IV: ge 60, ti 55, ta 60; MCh III: ge 45, ti 35; MCh II: ge 36.

Male. Preanal setae 6 pairs; anal pores distinct, not close together. There are specimens with additional setae, which shown in fig. 6, *7*. Spermatodactyl L-shaped, beak-shaped (fig. 6, *8*). Lds 383.

Diagnosis. *Transeius masseei* is the largest of the currently known phytoseiid species of Ukraine. The range of variability in the size of the dorsal shield of the largest shield of the female is as follows: Lds 435–535, Wds 260–290. The body size of males is also large: Lds 350–400, Wds 240–260.

Distribution, habitat, occurrence. Europe, North America. In Ukraine: Polissia, Forest-Steppe, Steppe; trees, shrubs, occasionally herbs; frequent. Most common on *Pyrus communis, Salix* sp., *Betula* sp., *Alnus glutinosa*.

Notes. 1. Some measurements and illustrations of non-type specimens from the Kyiv and Cherkasy Regions were made after comparison with types, as the former were in best condition.

2. A revision of the specimens from the Wainstein collection (SIZK) marked "*Amblyseius masseei* (Nesbitt)" showed that 3 mites were mounted on one slide and 2 on the other.

The slide #1304 contains mites, collected on *Prunus* sp. in Adler, Sochi, Krasnodar Region (Russia) in 1954 (exact date missing). Specimens were identified by B. A. Wainshtein, judging by the handwriting of the entry in the registration card. I identified instead one female *Neoseiulus bicaudus*, as well one female and deutonymph of *N. umbraticus* mounted in the specimen #1304.

Two females of *N. aurescens* were collected on *Salvia* sp. in Tbilisi, Georgia on 20.05 1955 and mounted on the slide #1392 labelled "*Amblyseius masseei*". Apart from these slides, there are no other specimens in the collection that have been labelled in one way or another as *Amblyseius masseei*. It is therefore clear that a misidentification has been made of the species, which is described in the literature, but at the time was little known to practicing taxonomists due to its rarity in the wild and in collections. Thus, *Amblyseius masseei* is not represented in the B. A. Wainstein collection.

Transeius montanus (Wainstein, 1962), comb. n. (fig. 7)

Amblyseius montanus Wainstein, 1962: 234; 1977: 240; Athias-Henriot, 1966: 220;
Typhlodromus montanus: Hirschmann, 1962: 256;
Neoseiulus montanus: Moraes et al., 1986: 90; Chant & McMurtry, 2007: 29.

Material. **Type**. Syntype ♀: [Kazakhstan], Trans-Ili Alatau, 1200–1500 m a. s. l., predominantly in coniferous forest, on various herbaceous plants, 20.06.1957, slide #1927 (SIZK).

Non-type. 133 ♀, 26 ♂ (159 specimens): Ukraine: Transcarpathian Region.

Redescription. Female. Dorsal shield (fig. 7, *1*) well sclerotized, oval-ovate, with shallow lateral emarginations, smooth, with a dark border along the edge; solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, *ic*). Dorsal setae PM3 and PM4 longest, thickened, slightly serrated; AM1 and AL3 are noticeably shorter of them, the rest are even shorter and aligned in length, and smooth. All dorsal setae shorter than distance to the next setae in the row. Seta AL1 half as long the distance to the theca of seta AL2. Setae PL1–PL3 equal in length. Peritreme extend beyond the theca of seta AD1. Genital shield narrower than ventrianal shield, elongated and pentagonal (fig. 7, 2), with almost parallel or slightly concave lateral margins; anal pores large, not shift to each other, slit-like, surrounded by cuticular ridge, which visually makes them larger. Metapodal shields distinct, narrow anterior one about half as long as larger posterior one (fig. 7, *3*). The posterior part of the peritremal shield from the stigma at first some narrows, then sharply widens caudally and ends in a coracoid (fig. 7, *4*). Chelicera has to 7 teeth on Df, and 1 on Dm (fig. 7, *5*). The funnel of the spermatheca is goblet; atrium sessile (fig. 7, *6*). Leg IV with 3 large macrosetae: longest on basitarsus, shortest on tibia (fig. 7, *7*). Genu III with short macroseta.

Measurements: Lds 370, Wds 225, Lvas 130, Wvas 105, Lian 33, Ltar IV 150; seta length: AD1 23; AD2 13, AD3 10; AD4 14; PD2 16; PD4 13; AM1 31; AM2 9; AL1 16; AL3 23; AL4 51; PL1 22; PL2 23; PL3 22; PM1; PM3 61; PM4 79; AS 23; PS 17; PV 44; MCh IV: ge 55, ti 39; ta 63, MCh III: ge 30.

Male. Ventrianal shield with 3 pairs of preanal setae, sometimes with one or both setae of an additional pair; anal pores large (fig. 7, *8*). The spermatodactyl L-shaped, with a funnel-shaped extension at the end (fig. 7, *9*). Lds 326.

Diagnosis. The species *T. montanus* is similar to *T. volgini*, from which it differs in the longer dorsal setae AD2, AM2, AD3, AD4, PD1 (9–16 μm), while in *T. volgini* their length is 5–8 μm; seta AL1 shorter than AL3 (on the contrary, in *T. volgini* AL3 longer than AL1); in *T. montanus*, seta PM1 somewhat shorter than PL3 (respectively, 18 and 22 μm), while in *T. volgini* they are equal in length (both 10 μm); setae PL1, PL2, PL3 in *T. montanus* of equal length (possible difference is no more than 1 μm), while in *T. volgini* their length is 23, 12, 10 μm; chelicera of *T. montanus* with 1 tooth on Dm, *T. volgini* with 3.

Distribution, habitat, occurrence. Europe (Ukraine), Caucasus (Georgia), Tien Shan (Kazakhstan). In Ukraine: Transcarpathian Region, near 800 m a. s. l., prefers herbs, rarely shrubs (*Malus* sp.); ordinary.

Notes. 1. Description, measurements and illustrations are based on non-type specimens from the Transcarpathian Region after comparing them with the type material of this species.

2. The text of the original description indicates that the number of pairs of the "small slit-like organs" (= dorsal solenostomes) is 5 (p. 235, first line from the top), whereas actually there are seven pairs of them.

Fig. 7. *Transeius montanus* (Wainstein, 1962), ♀ (*1–7*), ♂ (*8*, *9*): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV; *8* — ventrianal shield; *9* — chelicerae with spermatodactil.

Transeius proximus (Kolodochka, 1991) (fig. 8)

Amblyseius proximus Kolodochka, 1991: 23;
Transeius proximus: Chant & Murtry, 2007: 71.
Amblyseius (Amblyseius) avetianae: Kolodochka & Sklyar, 1981: 102 (misidentification).

Material. **Type**. Holotype ♀, Ukraine, Donetsk Region: Pokrovsk, 22.04.1963, 47°58'52.0" N 36°13'53.0" E. Paratype: 1 ♀, ibid., soil 5–10 cm, forest belt, 15.09.1969, specimen #S–114/129 (Skliar) (SIZK).

Non-type. Ukraine, Kyiv Region, Tetiyiv, industrial fruit garden, apple bark, 02.08.1990, slide #5399/62, 1 ♀, 49°25'36.0" N 29°40'35.0" E (*Tulgren funnel*) (coll. unknown) (SIZK).

Redescription. Female. Dorsal shield (fig. 8, *1*) moderately sclerotized, smooth, oval, with slight lateral emarginations; solenostomes 5 pairs (*it*, *il*, *isc*, *is*, *ic*; *id* not clearly expressed — in their place are dark rounded spots; *iv* missing). Dorsal setae PM3 and PM4 serrated, the rest smooth, differing in length. Seta AM1 longer then distance to theca AL1. Seta AL1 shorter then distance to theca AL3 which reaches the theca AL4. Seta PM1 in 3.5 times shorter than PL1. Seta PL3 shorter than PL2 by 1.5 times and practically equal to PL3. Setae AL4 and PM3 of equal length. The peritreme reach the theca AD1. Ventrianal shield (fig. 8, *2*) broadly pentagonal with slightly concave anterior margin and sculpture in the form of thin lines; anal pores contiguous, rounded. Metapodal shields elongated (fig. 8, *3*). Posterior part of peritremal shield rounded, narrowing in middle part, then widening, and ending coracoid with terminal pore (fig. 8, *4*). On Df seven teeth (5 distal, 2 basal); fifth tooth smoothed, and the seventh tooth at the finger base is miniature; Dm with 2 spaced teeth (the second tooth is smaller) (fig. 8, *5*). Spermatheca with a small, insufficiently clearly differentiated sessile atrium and a narrow infundibulum widening towards the sacculus (fig. 8, *6*). Leg IV with 3 long macrosetae: the shortest one on tibia (fig. 8, *7*). Genu III with small macroseta. Genu II without macroseta.

Measurements: Lds 358, Wds 220; Lvas 113, Wvas 99, Lian 36; Ltar 142; setae length: AD1 28; AD2 8; AD3 7; AD4 10; PD2 13; PD4 12; AM1 45; AM2 6; AL1 18; AL3 37; AL4 70; PL1 47; PL2 27; PL3 16; PM1 14; PM3 70; PM4 86; AS 18; PS 14; PV 60; MCh IV: ge 48, ti 39, ta 63; MCh III: ge 32.

Male unknown.

Diagnosis. From *Amblyseius (Amblyseius) avetianae* Arutujan et Ohandjanian, which is not represented in the fauna of Ukraine, *Transeius proximus* reliably differs by the AL1 half as long as the distance to the theca AL2; the distance between the anal pores much shorter than the distance between thecae in pair PrA2–PrA2; 6–7 teeth on Df and 1 on Dm; undifferentiated atritum fused with the base of the spermatheca funnel (whereas in *A. avetianae* the length of seta AL1 is equal to the distance to theca AL2; anal pores spaced on distance of thecae of setae PrA2–PrA2; 4 teeth on Df chelicerae and 2 on Dm; atrium elongated and delimited from the funnel) (fig. 8, *8*, *10*).

Distribution, habitat, occurrence. Ukraine: type locality and Kyiv Region, under maple bark, soil; rare.

Note. Description, illustrations, and dimensions are based on the holotype.

Fig. 8. *Transeius proximus* (Kolodochka, 1991), ♀ (*1–9*), *Amblyseius (Amblyseius) avetianae* Arutujan et Ohandjanian, 1972 (10): *1* — dorsal shield; *2* — ventral body surface; *3* — metapodal plates; *4* — caudal part of peritremal shield; *5* — chelicera; *6* — spermatheca; *7* — fragment of leg IV; *8* — chelicera; *9*, *10* — spermatheca.

Transeius volgini (Wainstein et Begljarov, 1971) (fig. 9)

Amblyseius volgini Wainstein & Begljarov, 1971: 1804; Chant & McMurtry, 2004: 187; Kolodochka, 2011: 322;
Amblyseius (Amblyseius) volgini: Wainstein, 1979: 140;
Typhlodromips volgini: Moraes et al., 1986: 152, 2004: 229;
Transeius volgini: Chant et McMurtry, 2007: 71; Kreiter et al., 2020: 212;
Transeius magnus Wu, 1987: 261 (synonymy according to Ryu & Ehara, 1991).

Material. **Types**. Holotype ♀, Russia, Primorsky Kray, wet meadow, on herbs, 09.09.1961, specimen #1911 (Begljarov) (ARRIP); paratype 1 ♀, slide #5489 (remounted from slide #1910) (SIZK).

Non-type. 47 ♀, 19 ♂ (66 specimens): Ukraine: Cherkasy, Chernihiv, Kyiv, Lviv, Mykolaiv, Rivne, Sumy, Ternopil, Volyn, Zhytomyr Regions.

Redescription. Female. Dorsal shield (fig. 9, *1*) well sclerotized, oval-ovate, with lateral emarginations, smooth, with a dark border along the edge; solenostomes 7 pairs (*it*, *iv*, *id*, *isc*, *il*, *is*, ic). Among the dorsal setae, AM1, AL3, PM3, and PM4 stand out for their length, of which PM4 is the longest, slightly serrate; the rest are shorter, smooth, pointed AD2–AD4, and AM2 are microsetae. Seta AL1 somewhat longer than seta AL2. Seta AM1 reach or slightly extend beyond theca of seta AL1. Setae PL1 the longest, and PL3 the shortest of the setae in row PL. Perithreme extend beyond the theca of seta AD1, their ends are bent caudally (fig. 9, *10*). Ventrianal shield pentagonal (fig. 9, *2*), slightly elongated, with nearly parallel or slightly concave lateral margins; anal pores round, distinct, spaced, located caudally as wide as the level of setae PrA2. Metapodal shield distinct, narrow anterior one about half as long as fusiform posterior (fig. 9, *3*). The posterior part of the peritremal shield is slightly curved, beak-shaped at the end (fig. 9, *4*). Df with 8–10 teeth, and Dm with 3 (fig. 9, *5*). The spermatheca is bell-shaped, the walls of the funnel are thickened; atrium sessile (fig. 9, *6*). Leg IV with 3 large macrosetes: almost equal in length on basitarsus and tibia, and shorter on genu (fig. 9, *9*). On the genu IV, III, and on the femur and genu II, one short macrosetae each.

Measurements: Lds 430, Wds 250, Lvas 136, Wvas 108, Lian 52, Ltar IV 127; setae length: AD1 20–24; AD2 7, AD3 6; AD4 6; PD2 8; PD4 9; AM1 40; AM2 5; AL1 22; AL3 16; AL4 46; PL1 23; PL2 12; PL3 10; PM1 10; PM3 62; PM4 100; AS 20; PS 21; PV 50; MCh IV: ge 66, ti 52, ta 70, MCh III: ge 34, ti 23, MCh II: fe 23, ge 30.

Male. Ventrianal shield with 4 pairs of preanal setae; anal pores round (fig. 9, *8*). The spermatodactyl is L-shaped, curved and rounded at the end (fig. 9, 9). Lds 326.

Diagnosis. Similar to *Transeius montanus*, from which differs by the ends of the peritremes bent back; by short dorsal setae AD2, AM2, AD3, AD4, PD1; by the relative length of some other setae, differences in the structure of the chelicerae digits and by others smaller characters (see a species profile of *T. montanus* for more details).

Distribution, habitat, occurrence. Europe: Russia (Primorsky Kray), Slovenia, Ukraine; South Korea. In Ukraine: Polissia (forest zone), forest-steppe zone; trees (prefers conifers, occasionally on hardwoods); common.

Note. Description, measurements and illustrations are based on non-type specimens from Lviv Region compared with the paratype and the original description of this species.

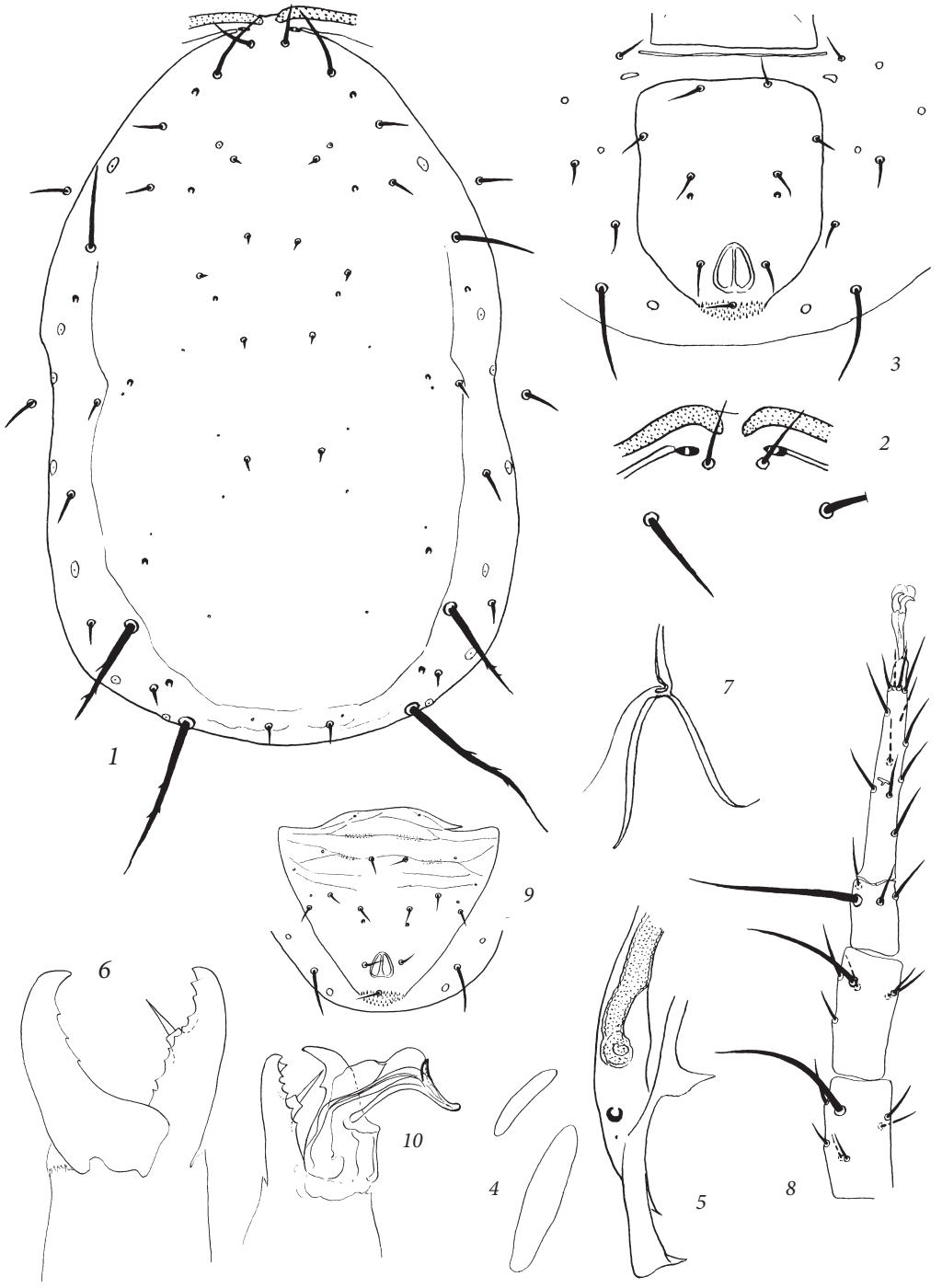

Fig. 9. *Transeius volgini* (Wainstein et Beglyarov, 1971), ♀ (*1–8*), ♂ (9, 10): *1* — dorsal shield; *2* — backward curved ends of peritremes; *3* — posterior part of ventral body surface; *4* — metapodal plates; *5* — posterior part of peritremal shield; *6* — chelicera; *7* — spermatheca; *8* — fragment of leg IV; *9* — ventrianal shield; *10* — chelicerae with spermatodactil.

Key to the species of the genus *Transeius* of the Ukrainian fauna

1. Ventrianal shield without anal pores 2
— Ventrianal shield with anal pores 3
2. Chelicera with 6 teeth on Df, with 2 teeth on Dm; length of spermathecal funnel equal to its width, the walls of the funnel are very thick, sharply thinning towards the sacculus ..... *T. herbarius*
— Chelicera with 4 teeth on Df, and with 1 tooth on Dm; funnel of elongated spermatheca thick-walled, gradually thinning towards the sacculus ..... *T. fragilis*
3. Funnel of spermatheca conical 4
— Funnel of the spermatheca of other shape 5
4. Chelicera with 2 large distal teeth and 11 miniature teeth on Df, Dm with 3 teeth; funnel of spermatheca is not twisted cochlearly in the part adjacent to the atrium ..... *T. jailensis*
— Chelicera with 8–9 teeth on Df; funnel of spermatheca in the part adjacent to the funnel is twisted cochlearly ..... *T. begljarovi.*
5. The funnel of the spermatheca mainly tubular in whole, with the largest diameter at the atrium, gradually narrowing towards the sacculus and widening conically approximately from the middle of its length 6
— Funnel of spermatheca bell-shaped 7
6. Dorsal seta PL1 more than three times as long as seta PM1; on Dm 2 teeth ..... *T. proximus.*
— Dorsal seta PL1 not more than twice as long as seta PM1; on Dm 1 tooth ..... *T. lutezhicus* **comb**. **n**.
7. Seta PM1 longer than half distance to base of seta PL1 ..... *T. masseei* **comb**. **n**.
— Seta PM1 shorter than half distance to base of seta PL1 8
8. Ends of the peritremes are bent caudally; anal pores round; chelicera with 3 teeth on Dm ..... *T. volgini*
— Ends of the peritremes are not bent caudally; anal pores oval; chelicera with one tooth on Dm ..... *T. montanus*, **comb**. **n**.

This study was funded for I. I. Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine (State Registration Number of the work: 0116U003015, II-51-21) by the National Academy of Sciences of Ukraine.

Acknowledgments

The author is deeply indebted to Valery Korneyev for his kind help in preparing the manuscript for publication and for important comments on its improvement.

References

Abbasova, E. D. 1970. Little known and new species of the predaceous mites Phytoseiidae of the fauna of Azerbaijan. *Zoologicheskii Zhurnal*, 49, 45–55 [In Russian].

Arutunjan, E. S. 1977. *Identification manual of phytoseiid mites of agricultural crops of the Armenian SSR*. Izdatelstvo Academii Nauk Armianskoy SSR, Erevan, 1–177 [In Russian].

Athias-Henriot, C. 1966. Contribution a l'etude des Amblyseius palearctiques (Acariens anactinotriches, Phytoseiidae). *Bulletin Scientifique de Bourgogne*, 24, 181–226.

Begljarov, G. A. 1958. Species of Phytoseiidae (Parasitiformes, Gamasoidea) as predators of tetranychid mites in gardens of Krasnodar Territory. *Trudy Vsesoyuznogo instituta zashchity rasteniy*, 10, 98–124.

Begljarov, G. A. 1981. *Keys to the determination of phytoseiid mites of the USSR. Information Bulletin of International Organization for Biological Control of Noxious Animals and Plants*. The East Palaearctic Section, Leningrad, Russia, 2, 1–97 [In Russian].

Chant, D. A. & McMurtry, J. A. 2004. A review of the subfamily Amblyseiinae Muma (Acari: Phytoseiidae): Part III. The tribe Amblyseiini Wainstein, subtribe Amblyseiina n. subtribe. *International Journal of Acarology*, **30** (3), 171–228.

Chant, D. A. & McMurtry, J. A. 2007. *Illustrated keys and diagnosis for the genera and subgenera of the Phytoseiidae of the world (Acari: Mesostigmata)*. Indira Publishing House, 1–220.

Denmark, H. A.& Muma, M. H. 1989. A revision of the genus *Amblyseius* Berlese, 1914 (Acari: Phytoseiidae). *Occasional Papers of the Florida State Collection of Arthropods*, 4, 1–149.

Denmark, H. A., Evans, G. A. 2019. *Additions to the world fauna of the family Phytoseiidae (Acari: Mesostigmata) with an illustrated key to the subfamilies, tribes, subtribes and genera of Phytoseiidae of the World*. Indira Publishing House, West Bloomfield, Michigan, USA, 1–315.

Ehara, S. 1966. A tentative catalogue of predatory mites of Phytoseiidae known from Asia, with descriptions of five new species from Japan. *Mushi*, 39, 9–30.

Faraji, F., Çobanoglŭ, S. & Çakmak, I. 2011. A checklist and a key for the phytoseiidae species of Turkey with two new species records (Acari: Mesostigmata). *International Journal of Acarology*, **37** (Suppl. 1), 221–243.

Hirschmann, W. 1962. Gangsystematik der Parasitiformes. Acarologie Schriftenreihe fur Schriftenreihe Vergliechende Milbenkunde, Hirschmann–Verlag, Furth/Bay, **5** (5–6), 1–80.

Hoy, M. A. 1982. Genetics and genetic improvement of the Phytoseiidae. *In*: *Recent Advances in knowledge of the Phytoseiidae*. Proceedings of a Formal Conference of the Acarological Society of America held at the Entomological Society of America Meeting. San Diego, Decemder, 1981. University of California Publications, 72–89.

Karg, W. 1970. Neue Arten Raubmilbenfamilie Phytoseiidae Berlese, 1916 (Acarina: Parasitiformes). *Deutsche Entomologische Zietschrift, Neue Folge*, **17** (1970), 289–301.

Karg, W. 1971. 59. Teil. Acari (Acarina), Milben Unterordnung / Anactinochaeta (Parasitiformes). Die freilebenden Gamasina (Gamasoides), Raubmilben. *Die Tierwelt Deutschlands und der angenzenden Meeresteile*. Gustav Fischer Verlag, Jena, 1–523.

Karg, W. 1993. 59. Teil. Acari (Acarina), Milben Parasitiformes (Anactinochaeta), Cohors Gamasina Leach, Raubmilben. *Die Tierwelt Deutschlands und der angenzenden Meeresteile*. Gustav Fischer Verlag, Jena, 1–475.

Kolodochka, L. A. 1973. Predatory phytoseiid mites (Parasitiformes, Phytoseiidae) of the Ukrainian SSR forest-steppe. Message I. Species of the genus Amblyseius. *Vestnik Zoologii*, 5, 78–81.

Kolodochka, L. A. 1974 a. Predatory phytoseiid mites (Parasitiformes, Phytoseiidae) of the Ukrainian SSR Wood-and-Steppe. Communication III. Key to genera and species. *Vestnik Zoologii*, 3, 87–89.

Kolodochka, L. A. 1974 b. A case of thelytoky in the predatory mite Amblyseius herbarius (Parasitiformes, Phytoseiidae). *Ecologia*, 4, 95 [In Russian].

Kolodochka, L. A. 1978. *Guidelines for the identification of plant-dwelling phytoseiid mites*. Naukova dumka, Kyiv, 1–78 [In Russian].

Kolodochka, L. A. 1981. New phytoseiid mites from Crimea (Parasitiformes, Phytoseiidae). Communication I. *Vestnik Zoologii*, 1, 18–22 [In Russian].

Kolodochka, L. A. 1984 a. Ecological characteristics of two parthenogenetic species of predatory mites (Parasitiformes, Phytoseiidae). *IX Congress of the All-Union Entomological Society. Tezisy dokladov, October 1984, Part I*. Naukova dumka, Kyiv, 232 [In Russian].

Kolodochka, L. A. 1984 b. Analysis of some ecological features of parthenogenetic and bisexual species of phytoseiid mites. *Vestnik Zoologii*, 5, 47–53 [In Russian].

Kolodochka, L. A. 1991. New species of phytoseiid mites of the genus Amblyseius (Parasitiformes, Phytoseiidae). *Vestnik Zoologii*, 3, 17–26 [In Russian].

Kolodochka, L. A. 2011. Species composition of mites of the family Phytoseiidae (Acarina, Parasitiformes) on plants of the Desnyansko-Starogutsky National Natural Park. *Vestnik Zoologii*, **45** (4), 321–326 [In Russian].

Kolodochka, L. A. 2012. The predatory mites (Phytoseiidae, Parasitiformes) in the fauna of Ukraine: a new species and a new subgenus of the genus Graminaseius. *Zoodiversity*, 56 (6), 463–472. DOI 10.15407/zoo2022.06.463

Kolodochka, L. A. & Bondarenko, L. V. 1993. Plant inhabitant phytoseiid mites of the Chernomorsky Reserve with description of two new species of the genus Amblyseius. *Vestnik Zoologii*, 4, 32–38 [In Russian].

Kolodochka, L. A. & Omeri, I. D. 2011. *Predatory mites of the family Phytoseiidae (Parasitiformes) of arboretums and botanical gardens of the Forest-Steppe of Ukraine*. Kyiv, 1–192 [In Russian].

Kolodochka, L. A. & Sklyar, V. E. 1981. Phytoseiid mites (Phytoseiidae, Parasitiformes) from the soil, litter, and nests of rodents in the steppe and wood-and-steppe zones of Ukraine. Problems of soil zoology. *VII All-Union. Meeting (Kyiv, 1981): Proceeding Reports*, 102–103 [In Russian].

Kreiter, S., Amiri, K., Douin, M., Bohinc, T., Trdan, S. & Tixier, M.-S. 2020. Phytoseiid mites of Slovenia (Acari: Mesostigmata): new records and first description of the male of Amblyseius microorientalis. *Acarologia*, **60** (2), 203–242. https://doi.org/10.24349/acarologia/20204364.

Livschitz, I. Z. & Kuznetzov, N. N. 1972. Phytoseiid mites from Crimea (Parasitiformes: Phytoseiidae): 13–64. *In*: *Pests and diseases of fruit and ornamental plants.* Yalta, The State Nikita Botanical Gardens, Proc. 61, 1–144 [In Russian].

Nesbitt, H. H. J. 1951. A taxonomic study of the Phytoseiidae (Family Laelaptidae) predaceous upon Tetranychidae of economic importance. *Zoologische Verhandelingen*, 12, 1–64.

Moraes, G. J., McMurtry, J. A. & Denmark, H. A. 1986. *A catalog of the mite family Phytoseiidae. References to taxonomy, synonymy, distribution and habitat*. EMBRAPA–D.D.D., Brasilia. Brazil, 1–353.

Moraes, G. J. de, McMurtry, J.A., Denmark, H. A. & Campos, C. B. 2004. A revised catalog of the mite family Phytoseiidae. *Zootaxa*, 434, 1–494. https://doi.org/10.11646/zootaxa.434.1.1

Muma, M. H. 1961. Subfamilies, genera, and species of Phytoseiidae (Acarina: Mesostigmata). *Florida State Museum Bulletin of Biological Sciences*, **5** (7), 267–302.

Papadoulis, G. Th. & Emmanouel, N. G. 1990. Phytoseiid mites of Greece: new records of species and descriptions of the male and immature stages of *Typhlodromus erymantii* Papadoulis et Emmanuel. *Bioliogia Gallo–Hellenica*, 17, 13–26.
Papadoulis, G. Th. & Emmanouel, N. G. 1991. The genus *Amblyseius* (Acari: Phytoseiidae) in Greece with the description of a new species. *Entomologia Hellenica*, 9, 35–62.
Papadoulis, G. Th., Emmanouel, N. G. & Kapaxidi, E. V. 2009. *Phytoseiidae of Greece and Cyprus (Acarina: Mesostigmata)*. Indira Publishing House, West Bloomfield, 1–200.
Ryu, M. O. & Ehara, S. 1991. Three phytoseiid mites from Korea (Acari, Phytoseiidae). *Acta Arachnologica*, **40** (1), 23–30. https://doi.org/10.2476/asjaa.40.23
Tixier, M.-S., Augerb, Ph., Migeon, A., Douina, M., Fossoudc, A., Navajas, M. & Arabuli, T. 2021. Integrated taxonomy supports the identification of some species of Phytoseiidae (Acari: Mesostigmata) from Georgia. *Acarologia*, **61** (4), 824–844. https://doi.org/10.24349/m2Rp-WodG
Wainstein, B. A. 1960. New species and new subspecies of the genus Typhlodromus Scheuten (Parasitiformes, Phytoseiidae) of the USSR fauna. *Zoologicheskiy Zhurnal*, **39** (5), 683–690 [In Russian].
Wainstein, B. A. 1962. New predatory mites of the fam. Phytoseiidae (Parasitiformes) of the USSR fauna. *Entomologicheskoye Obozrenie*, **41** (1), 230–240 [In Russian].
Wainstein, B. A. 1972. New species of the family Phytoseiidae (Parasitiformes). *Zoologicheskiy Zhurnal*, **51** (9), 1407–1411 [In Russian].
Wainstein, B. A. 1973. On the position of the genus Evansoseius Sheals in system of the family Phytoseiidae (Parasitiformes). *Zoologicheskiy Zhurnal*, **52** (2), 274–277 [In Russian].
Wainstein, B. A. 1975. To the fauna of predatory mites of the fam. Phytoseiidae (Parasitiformes) of the Yaroslavl region. *Entomologicheskoye obozrenie*, **54** (4), 914–922 [In Russian].
Wainstein, B. A. 1977. Fam. Phytoseiidae Berlese, 1916. *In*: *Opredelitel obitaiushchikh v pochve kleshchei Mesostigmata*. Nauka, Leningrad, 226–244 [In Russian].
Wainstein, B. A. 1979. Predatory mites of the family Phytoseiidae (Parasitiformes) of the Primorsky Territory. *Nazemnye Chlenistonogie Dal'nego Vostoka*, Vladivostok, Russia, 137–144 [In Russian].
Wainstein, B. A. & Beglyarov, G. A. 1971. New species of mites of the genus Amblyseius (Parasitiformes, Phytoseiidae) from Primorsky Krai. *Zoologicheskiy Zhurnal*, **50** (12), 1803–1812 [In Russian].
Westerboer, I. & Bernhard, F. 1963. Die Familie Phytoseiidae Berlese, 1916. *In*: Stammer, H., ed. *Beitrage zur Systematik und Okologie Mitteleuropaischer Acarina. Band II. Mesostigmata I.* Germany, 451–791.
Wu, W. N. 1987. New species and new records of phytoseiid mites from northeast China. II. Amblyseius Berlese (Acarina: Phytoseiidae) [in Chinese]. *Acta Zootaxonomica Sinica*, **12** (3), 260–270 [In Chinese].

Received 3 March 2023
Accepted 26 April 2023