Vestnik zoologii, **43**(6): e-1—e-12, 2009
DOI 10.2478/v10058-009-0021-y

UDC 595.422

A REVIEW OF PREDACEOUS MITES OF THE GENUS *TYPHLOCTONUS* MUMA (PARASITIFORMES, PHYTOSEIIDAE) IN UKRAINE WITH THE DESCRIPTION OF UNKNOWN MALE OF *T. TUBERCULATUS*

L. A. Kolodochka

Schmalhausen Institute of zoology NAS of Ukraine,
Chmielnicky str., 15, Kyiv, 01601 Ukraine
E-mail: leon@izan.kiev.ua

Accepted 28 November 2007

A Review of Predaceous Mites of the Genus *Typhloctonus* (Parasitiformes, Phytoseiidae) in Ukraine with the Description of an Unknown Male of *T. tuberculatus*. Kolodochka L. A. — Predaceous mites of the genus *Typhloctonus* Muma, 1961 from different plants in Ukraine are reviewed. Four species of the genus *Typhloctonus* are occurring in Ukraine: *T. tiliarum* (Oudemans, 1930), *T. aceri* (Collier, 1957), *T. runiacus* Kolodochka, 1980 and *T. tuberculatus* (Wainstein, 1958) described, illustrated, measured and keyed (on females). These species differ not only by the features earlier indicated but by some additional characters revealed in this study. Type material of *Typhlodromus tuberculatus* Wainstein, 1958 have been revised and lectotype designated. Unknown male of *T. tuberculatus* is described, measured and illustrated. Study of the holotype *Seiulus (Typhloctonus) arutunjani* Kuznetsov, 1984 shows it to be a junior synonym of the *Typhloctonus tuberculatus* (Wainstein, 1958).

Key words: phytoseiid mites, *Typhloctonus,* Ukraine.

Обзор хищных клещей рода *Typhloctonus* (Parasitiformes, Phytoseiidae) в Украине, с описанием неизвестного самца *T. tuberculatus*. Колодочка Л. А. — Установлено что в Украине на растениях обитает 4 вида клещей рода *Typhloctonus* (Parasitiformes, Phytoseiidae): *T. tiliarum* (Oudemans, 1930), *T. aceri* (Collier, 1957), *T. runiacus* Kolodochka, 1980 и *T. tuberculatus* (Wainstein, 1958). Они различаются не только по известным ранее признакам, но и по дополнительным, выявленным в процессе исследования. Даны описания, рисунки, морфометрия, оригинальный ключ четырех видов (по самкам). В результате ревизии типового материала *Typhlodromus tuberculatus* Wainstein, 1958 обозначен лектотип. Приведены морфометрические данные и иллюстрированное описание ранее неизвестного самца *T. tuberculatus*. Изучение голотипа *Seiulus* (*Typhloctonus*) *arutunjani* Kuznetsov, 1984 показало, что это название следует считать младшим синонимом *Typhloctonus tuberculatus* (Wainstein, 1958).

Ключевые слова: клещи-фитосейиды, *Typhloctonus,* Украина.

Introduction

Phytoseiid mites constantly are in visual field of the researchers as a group of predaceous arthropod many species of which are used in biological control of pest on culture plants. In the last years some large publications, which summarized results of faunistic and taxonomy researches of these mites in a global scale were issued (Moraes et al., 2004; Kolodochka, 2006; Chant, McMurtry, 2007). But a species structure of phytoseiids in local territories, feature of mites distribution, etc. remained little-studied or unexplored things in many aspects. This publication is an attempt to correct a situation concerning the genus *Typhloctonus* Muma, 1961, some species of which inhabit territory of Ukraine and take part in natural control of ability to functioning perennial plant coenoses.

Phytoseiid mites of the genus *Typhloctonus* are submitted by 8 species in the Palaearctic fauna. Some time ago the genus *Typhloctonus* was subdivided into two subgenera. Monotypic subgenus *Pegodromus* which contains one species *T.* (*P*). *crassipilis* (Athias-Henriot et Fauvel, 1981) does not occur in Ukrainian fauna.

Historical notes

There is some information on local findings of *Typhloctonus* species in Ukraine in the literature. Previously some species of this genus were described in the genus *Typhlodromus*. *Typhlodromus formosus* Wainstein, 1958 was found in plant associations of the cities Lvov and Tchernovtsy (Wainstein, 1958). Akimov and Kolodochka (1970) reported *Typhlodromus* (*T.*) *tiliarum* (Oudemans, 1930) in Central Forest-Steppe of Ukraine (near Kaniv, Cherkassy region). Livshits and Kuznetsov (1972) reported *T. aceri* (Collyer, 1957) and *T. tiliarum* from some plants in Crimea (Ukraine). Kolodochka (1974) found *Typhlodromus* (*T.*) *formosus* in other areas of Cherkasskaja oblast and in other areas of the Forest-Steppe zone of Ukraine (Vinnitsa, Poltava, Sumy, and Kyiv regions). The data on detection of *Typhlodromus* (*T.*) *squamiger* Wainstein, 1960 in Poltava, Cherkassy and Kyiv regions were given in the same article (Kolodochka, 1974). Beglarov and Malov (1977) informed about the presence of species *T.* (*T.*) *tiliarum* and *T.* (*T.*) *aceri* «in several areas of Moldova, as well as in Ivano-Frankivsk and Chernivtsy regions the Ukraine». Kolodochka (1980) described *T. runiacus* Kolodochka, 1980 found on alder green *Alnus viridis* D. C. from timberline and alpine meadows (Polonyna Runa) of the Ukrainian Carpathian Mountains. Kolodochka (1981) reported *T. tuberculatus* finding in Crimia Mountains (1-st range) on trees (maple *Acer stevenii* Pojark.). Kuznetsov (1984) described *Seiulus* (*Typhloctonus*) *arutunjani* Kuznetsov from *Artemisia* sp. in Southern coast of Crimea. Chant (1959) synonymized *T.* (*T.*) *formosus* Wainstein with *T.* (*T.*) *tiliarum*, but Hirschmann (1962) restored it from synonymy, and Denmark et Rather (1984) supported Hirschmann' opinion. Denmark et Rather (1984) synonimized *T.* (*T.*) *squamiger* Wainstein with *T.* (*T.*) *aceris* Lehman. Kolodochka (1986) shown that in details *T. formosus* is a junior synonym of *T. tiliarum* and *T. squamiger* is a junior synonym of *T. aceri*. Kolodochka (2006) reported *T. tuberculatus* in Kremenets Mountains (Ukraine).

Material and methods

Mites of the genus *Typhloctonus* collected many years in different regions of Ukraine are reidentified and redescribed below. The setal nomenclature follows Kolodochka (2006) and that the spermatheca structures follows Kolodochka (1990). The measurements are given in micrometers. Type material is deposited in the collection of the Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv (SIZK) was studied. Specimens of *Typhloctonus* from Wainstein's memorial collection which deposited in SIZK also was exanined.

Syntypes of *Typhlodromus tuberculatus* Wainstein, 1958 from the Wainstein's memorial collection were in the scope of this revision. The most extant specimen of them designated here as lectotype: "1 ♀ - Лектотип, N 2061, клен (Acer sp.), Рача, с. Глола, высокогорная часть Онского р-на, Западная Грузия, Грузинская ССР, колл. Н.И. Якобашвили, 9.08 1956 г." (1 ♀ — lectotype, N 2061, maple (Acer sp.), Racha, Glola village, high-mountain part of Onsky district, West Georgia, Grusin SSR, coll. N. I. Jakobashvily, 09.08.1956). Other 5 females—syntypes (N 2062, 2063, 2064, 2065, 1664) with the same place and data of collection designated here as paralectotypes.

Unknown earlier male of *Typhloctomus tuberculatus* have been found on maple *Acer pseudoplatanus* L. in Kremenets Mountains (see below). An illustrated description is given.

The holotype of *Seiulus* (*Typhloctonus*) *arutunjani* Kuznetsov, 1984 deposited in collection of Nikita State Botanic Garden, Yalta, Crimea, Ukraine as well as the holotype of *Typhloctonus runiacus* Kolodochka, 1980 were revised too.

Typhloctonus Muma, 1961: 299

Type species: *Typhlodromus tiliarum* Oudemans, 1930.

Dorsal shield of female with 19—21 pairs of setae (AS and PS or only PS in some species on dorsal shield) and up to 6 pairs of solenostomes (there can be various combinations 7 pairs — it, iv, id, isc, il, is, ic); moderately to strongly sclerotized, sculptured mesh or convex-mesh. Dorsal setae thin or moderate thickness, sharp or blunt, smooth or serrate, sometimes on tubercles. Peritremes supplied with chaetoids, short (come only for a level flew AS) or long (almost reach thecae of setae D1). Ventrianal shield with 4 pair preanal setae (PrA1, PrA2, V2, V3). Setae V1, MV1, MV2, PV on interscutal membrane. Anal pores missing or present. Macrosetae (only on basitarsus of legs IV) moderate to short, sharp or clavate, macrosetae on legs missing. Gnatosoma of usual proportions. Chelicerae moderate in size, with small or moderate number denticles on fingers.

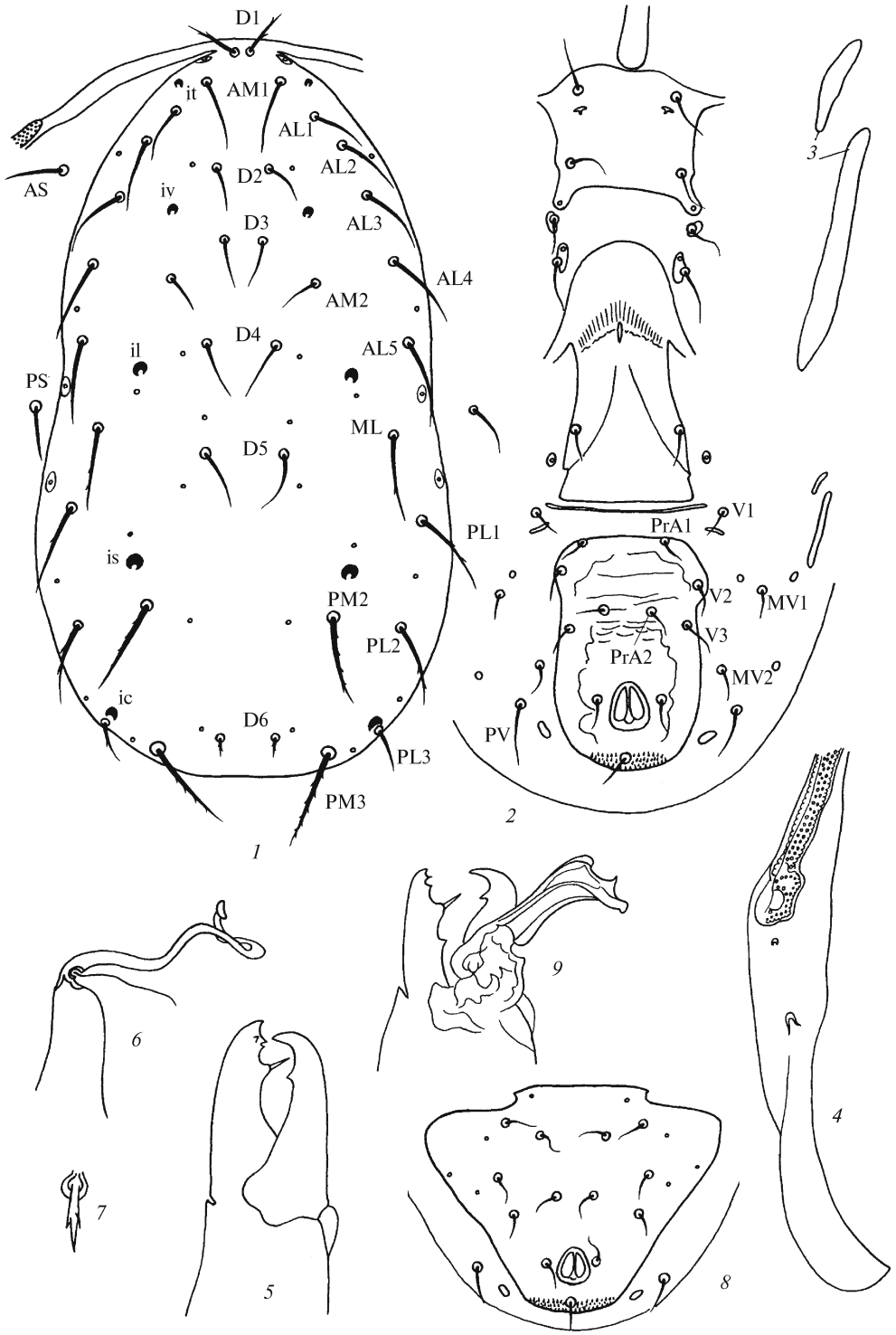

Fig. 1. *Typhloctonus tiliarum* (female — *1*–*7*, male — *8*–9): *1* — dorsal shield; *2* — fragment of ventral side of idiosoma; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicerae; *6* — spermatheca; *7* — seta D6; *8* — posterior part of opistosoma; *9* — chelicera and spermatodactil.

Рис. 1. *Typhloctonus tiliarum* (самка — *1*–*7,* самец — *8*–9): *1* — спинной щит; *2* — фрагмент вентральной сторона идиосомы; *3* — метаподальные щитки; *4* — задняя часть перитремального щита; *5* — хелицера; *6* — сперматека; *7* — щетинка D6; *8* — задняя часть опистосомы; *9* — хелицера и сперматодактиль.

Typhloctonus tiliarum (Oudemans, 1930) (fig. 1)

Female. Dorsal shield (fig. 1, *1*) weakly sclerotized, covered with net-scaled sculpture, better expressed in back half of shield, lengthened, with hardly planned lateral cuts, with 5 pairs distinct solenostomes (iv, il, is — very large, rounded, it, ic — smaller, crescent). Setae D6, PM2, PM3 serrated, setae D1, ML, PL1–PL3 with 1–2 notches not always distinct visible. Setae AM1 more longer then length from its theca to theca of setae AL1. Setae PL2 and PM2 virtuallally equal in length. Peritremes short, rarely reach to level of setal thecae AL3, very seldom reaching level AL1. Sternal shield with 2–3 pairs setae (fig. 1, *2*). Kolodochka (1986) discussed the variability of an arrangement of setae St3. Ventrianal shield narrow with 4 pairs preanal setae. Anal pores missing. Metapodal platelets narrow, posterior platelets three times longer then anterior one (fig. 1, *3*). Posterior part of peritremal shield weakly curled (fig. 1, *4*). Chelicerae with 3 denticles on Df and 1 on Dm (fig. 1, *5*). Funnel of spermatheca bell–shaped, athrium sedentary (fig. 1, *6*). Macrosetae on legs missing.

Measurements: Lds 325–350, Wds 155–180; Lvas 90–105, Wvas 60–70; Lt 74–78; D1 17–20; D2 18–20; D3 16–20; D4 19–23; D5 24–29; D6 7–9; AM1 25–34; AM2 16–18; AL1 20; AL2 28–32; AL3 28–33; AL4 31–37; AL5 33–36; ML 31–36; PL1 36–40; PL2 33–37; PL3 16–19; PM2 33–39; PM3 41–45; AS 27–31; PS 19–25; PV 22–25.

Male. Ventrianal shield with 5 pairs of preanal setae (fig. 1, *8*). Spermatodactyle L-shaped (fig. 1, *9*).

Measurements: Lds 270, Wds 138; Lvas 100, Wvas 140; Lt 65; D1; D2 15–17; D3 13–14; D4 16; D5 17–18; D6 5,5–6; AM1 23–24; AM2 12–16; AL1 16–20; AL2 22–24; AL3 22–23; AL4 27; AL5 26–27; ML 25–28; PL1 28–29; PL2 20–23; PL3 10–11; PM2 25–30; PM3 33–34; AS 22–23; PS 16–18; PV 14–15.

Notes. According to the Catalog of Phytoseiidae (Moraes et al., 2004) the distribution area of *Typhloctonus tiliarum* is extended across some natural zones (Forest, Forest-Steppe, the Mediterranean, Mountain Areas in Europe, North Africa, and North America). In Ukraine, *T. tiliarum* may be found usually on different trees and shrubs and by accident on herbage (Vinnitsa, Cherkassy, Poltava, Rovno, Kyiv regions, Zakarpattia Region: Perechinski, Svaliavski, Tiachevski districts; Crimea: Sudak District, Jalta; in Wainstein memorial collection — Lviv city, Chernivtsy).

Typhloctonus aceri (Collier, 1957) (fig. 2)

Female. Dorsal shield (fig. 2, *1*) heavily sclerotized, with net–scale like sculpture, without lateral cuts, with 5 pairs distinct rounded solenostomes (it, iv, il, is, ic). Almost all dorsal setae serrated (D3 and AM2 may be smooth or with 1–2 notches). Setae AS always outside dorsal shield, setae PS on margins of one. Setae AM1 longer then length from its theca to theca of setae AL1. Setae PL1 and PM2 virtually equal in length. Peritremes reach to level of thecae AM1. Sternal shield (fig. 2, *2*) with 3 pairs of setae; narrow figured protuberances with setae St3 (placement of setae St3 on separate plates may be found very rarely: in my collection only one female from Crimea with this variation). Ventrianal shield near square in form with 4 pairs preanal setae. Rounded anal pores small and wide straddling. Chelicera with 2 denticles on Df and with 0 on Dm (fig. 2, *5*). Funnel of spermatheca cup–shaped, athrium large, sedentary (fig. 2, *6*). Macrosetae on legs missing.

Measurements: Lds 345–355, Wds 210–215; Lvas 100–103, Wvas 84–86; Lian 55–56; Lt 63–72; D1 14–17; D2 17; D3 14–16; D4 19–21; D5 25–31; D6 13–14; AM1 25–27; AM2 14–16; AL1 21–22; AL2 25–27, AL3 28, AL4 25–31; AL5 25–31; ML 28–30; PL1 25–34;PL2 25–26; PL3 15–17; PM2 34–36; PM3 39–42; AS 20–25; PS 19; PV 12–17.

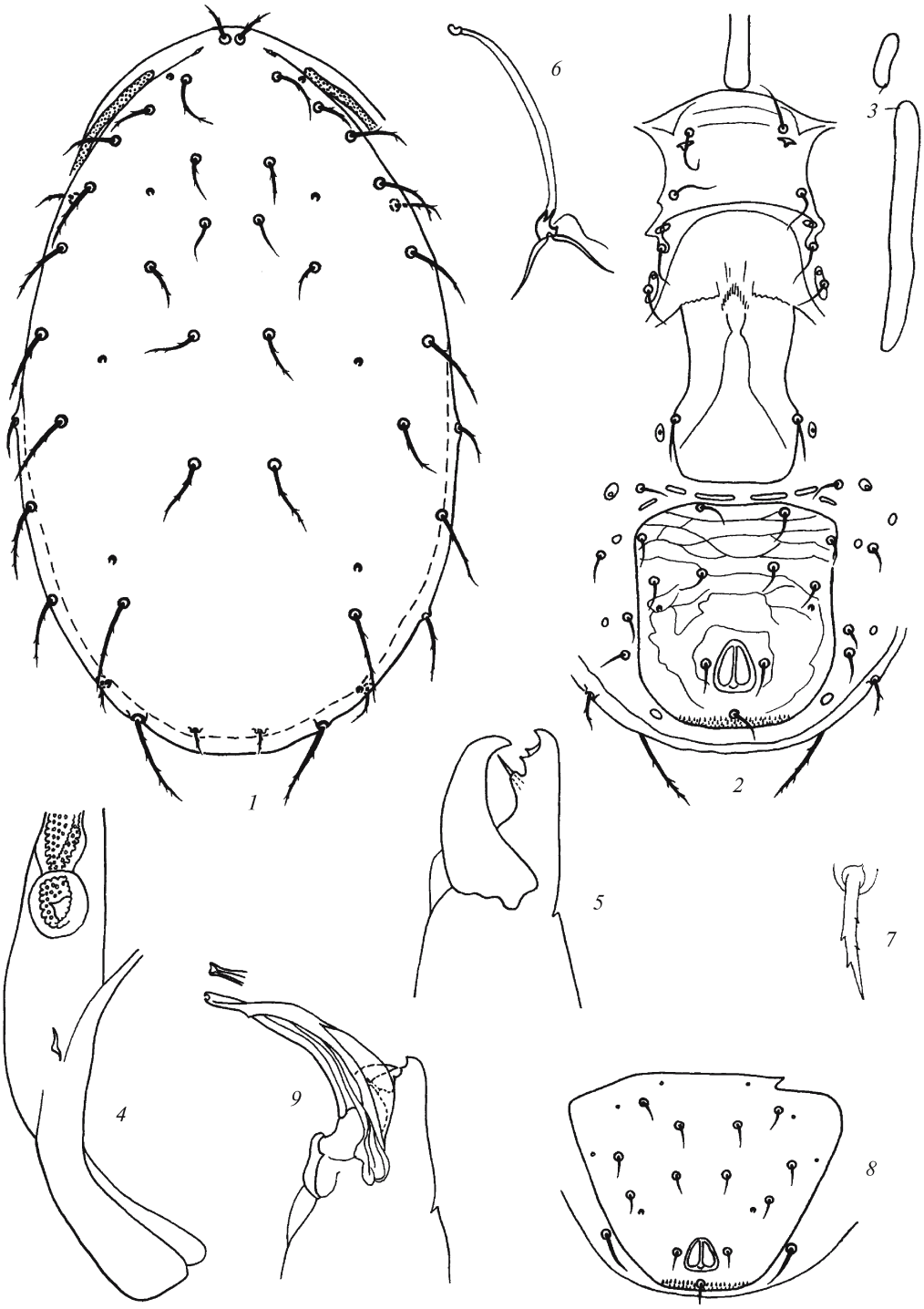

Fig. 2. *Typhloctonus* aceri (female — *1*–*7*, male — *8*–9): *1* — dorsal shield; *2* — fragment of ventral side of idiosoma; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicerae; *6* — spermatheca; *7* — seta D6; *8* — posterior part of opistosoma; *9* — chelicera and spermatodactil.

Рис. 2. *Typhloctonus aceri* (самка — *1*–*7*, самец — *8*–9): *1* — спинной щит; *2* — фрагмент вентральной сторона идиосомы; *3* — метаподальные щитки; *4* — задняя часть перитремального щита; *5* — хелицера; *6* — сперматека; *7* — щетинка D6; *8* — задняя часть опистосомы; *9* — хелицера и сперматодактиль.

Male. Ventrianal shield with 5 pairs preanal setae; anal pores distinct and wide straddling (fig. 2, *8*). Spermatodactyle weakly curved (fig. 2, *9*).

Measurements: Lds 230, Wds 142; Lvas 93, Wvas 113; Lian 55–47; Lt 47; D1 13; D2 19, D3 16; D4 20–22; D5 29–33; D6 8–12; AM1 23–24; AM2 16–17; AL1 23–24; AL2 22–26; AL326– 27; AL4 28–32; AL5 27–33; ML 26–28; AS 13–18, PS 15–23, PV 9–11; PL1 30–32; PL2 23–30; PL3 9–13; PM2 30–33; PM3 30–33.

Notes. *Typhloctonus aceri* (Collyer, 1957) was described from *Acer campestre L.* in Essex, Writtle (England). This species is widespread in Europe and the Mediterranean on some trees (rarely on shrabs).

According to Catalog of Phytoseiidae (Moraes et al., 2004) *T. aceri* occurs in England, USA, Azerbaijan, Crimea, Moldova.

In Ukraine this species known from elm (*Ulmus* sp.), hazel (*Corylus* sp.) in Lviv and Tchernivtsy (Wainstein, 1958), and from Circassian walnut in Jalta (Crimea) (Livshits, Kuznetsov, 1972).

In the author's collection of Ukrainian phytoseiids are deposited the specimens of *T. aceri* which found on maple (*A. platanoides* L.), pear tree (*Pyrus* sp.), elder (*Sambucus* sp.), spruce (*Picea glauca* (Moench) Voss.) in Forest-Steppe zone as well on maple in Mt. Bozhia (Kremenets Mountains near Berezhkovtsy vill., Kremenets region, Ternopol region), and on common maple (*Acer campestre* L.) in Karadag natural reserve (Eastern Crimea).

Typhloctonus runiacus Kolodochka, 1980 (fig. 3)

Female. Dorsal shield (fig. 3, *1*) is heavily sclerotized, covered with tuberculous sculpture, expressed better in posterior half of shield, with hardly planned lateral cuts, with 4 pairs distinct solenostomes (iv, id, il, ic very large, rounded; is — missing). Setae D6 and PM3 serrated, other setae smooth. Setae AM1 equal in length a distance from thecae of them to thecae of setae AL1. Setae PL1 and PM2 roughly equal in length. Peritremes come to thecae D1. Sternal shield (fig. 3, *2*) with 2 pairs of setae, setae ST3 sit on small plates. Ventrianal shield almost square in shape with 4 of pairs preanal setae. Anal pores small and wide straddling. Chelicerae with 4–6 small denticles on Df and with 2 on Dm (fig. 3, *5*). Funnel of spermatheca cup–shaped, athrium sedentary (fig. 3, *6*). Macrosetae on legs missing.

Measurements: Lds 383, Wds 266; Lvas 109, Wvas 109; Lian 65; Lt 109; D1, D2, D6, AL1 — 17; D3 18; D4, AL4 — 27; D5, PL1 —31; AM1 23; AM2 20; AL2 25; AL3, PL2 — 26; AL5 29; ML 28; PL3 22; PM2 38; PM3 42; AS 21; PS 12; PV 16.

Male. Ventrianal shield with 5 pairs preanal setae and distinct wide straddling anal pores (fig. 3, *8*). Spermatodactyle curved (fig. 3, *9*).

Measurements: Lds 333, Wds 213; Lvas 118, Wvas 155; Lian 44; Lt 66; D1 16; D2, D3 17–19; AL1 18; AL2 25; AL3, AL4 — 27; AL5 33; ML 30; PL1 37; PL2 30; PL3 22; PM2 42; PM3 45; PV 21; AS 21, PS 16.

Distribution. This species alike a precinctive form. It was not found in other parts of Ukraine besides the Carpathian Mountains. Holotype–female and paratype–female were found on *Alnus viridis* A. C. from line of a wood and Alpine meadow (Polonyna Runa) of the Ukrainian Carpathian mountains, 1000 m about sea level, near Turia Poliana village, near Perechin, Zakarpattia region, Ukraine, 28.08.1976. Five females and one male (paratype) were found on *Fagus silvatica* L., ibid., the same data (coll. Kolodochka).

Typhloctonus tuberculatus (Wainstein, 1958) (fig. 4, 5)

Seiulus (Typhloctonus) arutunjani Kuznetsov, 1984, **syn. n**.

Female. Dorsal shield (fig. 4, *1*) heavily sclerotized, covered with tuberculous sculpture, expressed better in a posterior half of shield, with 4 pairs distinct solenos-

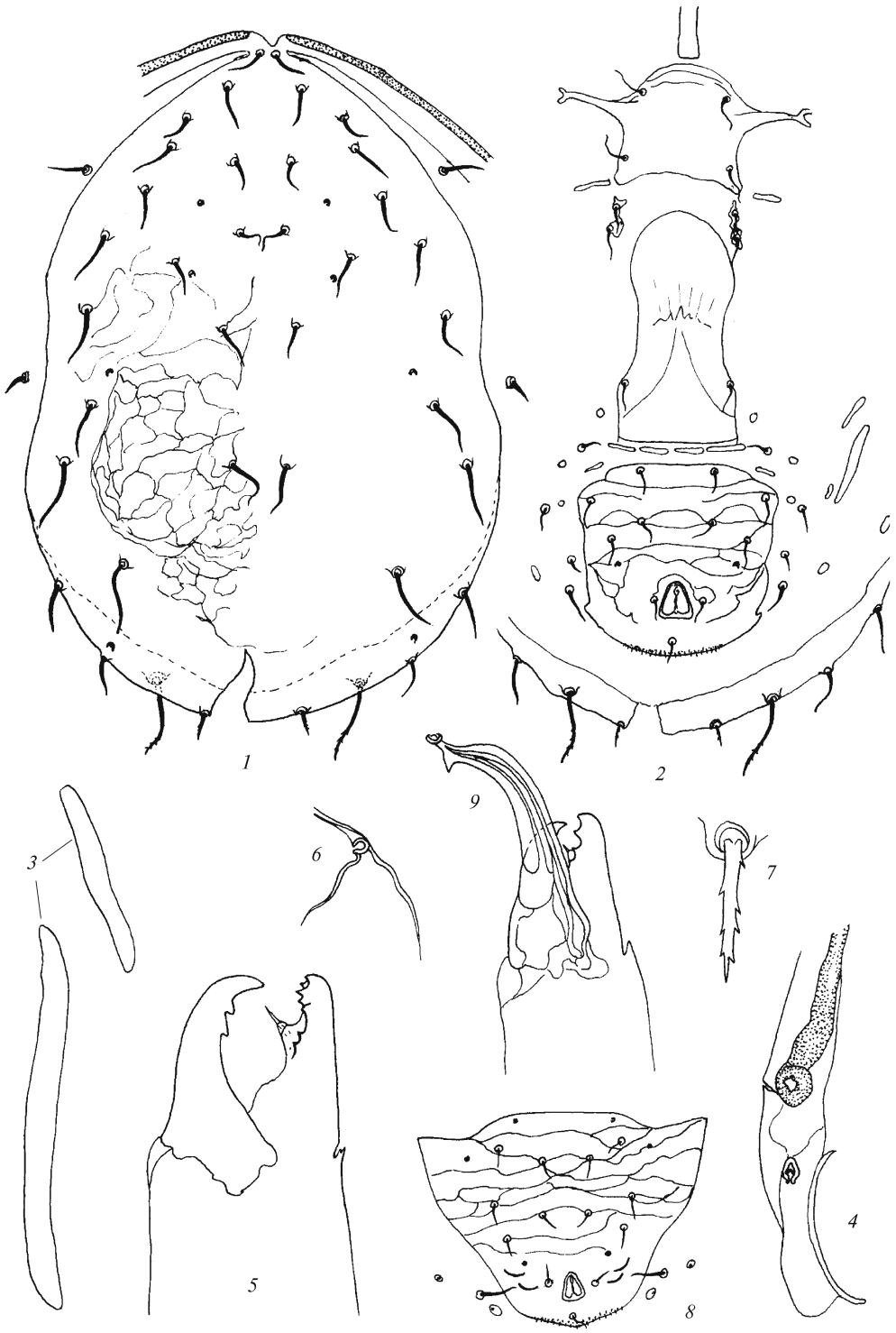

Fig. 3. *Typhloctonus runiacus* (female — *1*–*7*, male — *8*–9): *1* — dorsal shield; *2* — fragment of ventral side of idiosoma; *3* — metapodal plates; *4* — posterior part of peritremal shield; *5* — chelicerae; *6* — spermatheca; *7* — seta D6; *8* — posterior part of opistosoma; *9* — chelicera and spermatodactil.

Рис. 3. *Typhloctonus runiacus* (самка — *1*–*7,* самец — *8*–9): *1* — спинной щит; *2* — фрагмент вентральной сторона идиосомы; *3* — метаподальные щитки; *4* — задняя часть перитремального щита; *5* — хелицера; *6* — сперматека; *7* — щетинка D6; *8* — задняя часть опистосомы; *9* — хелицера и сперматодактиль.

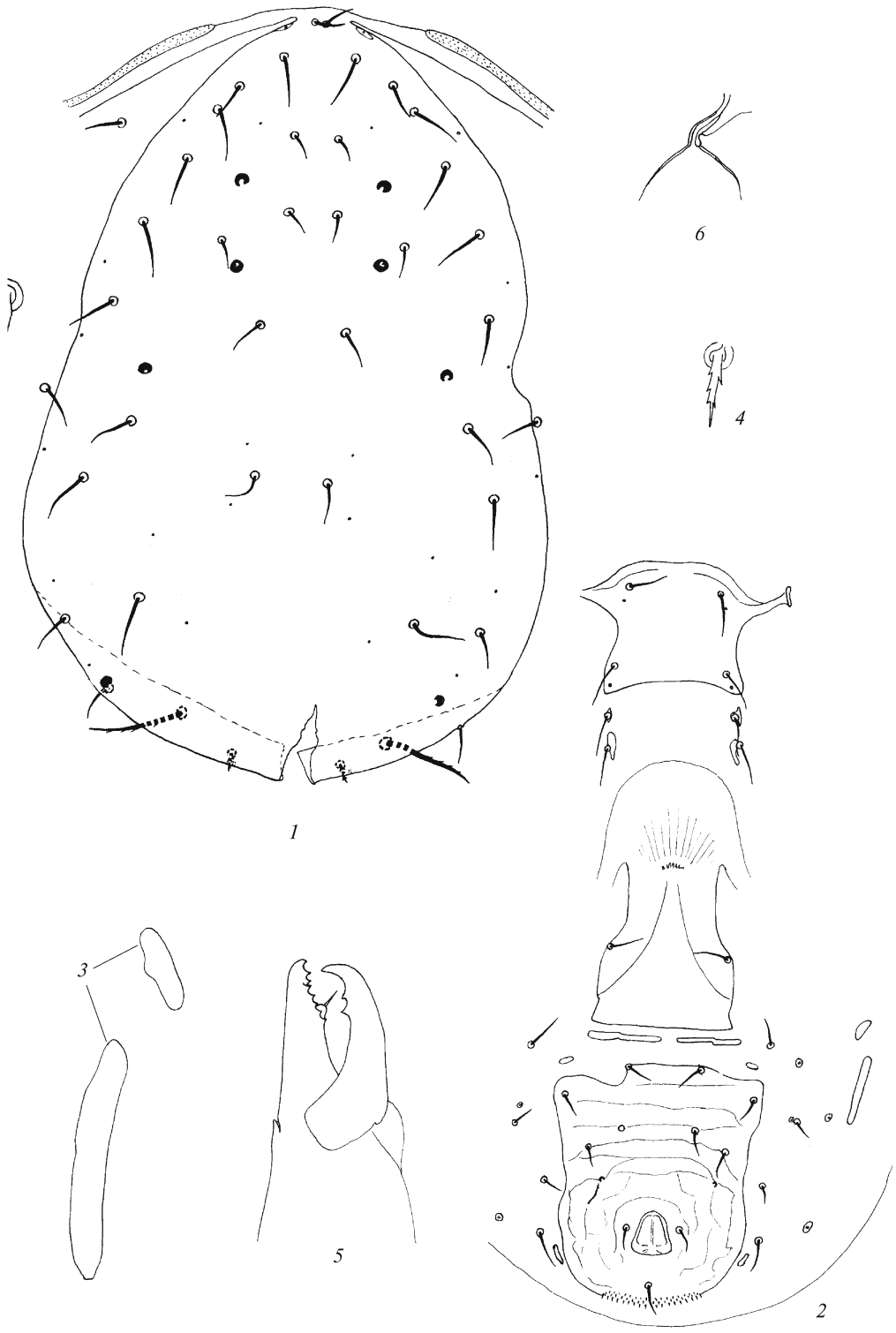

Fig. 4. *Typhloctonus tuberculatus*, ♀: *1* — dorsal shield; *2* — fragment of ventral side of idiosoma; *3* — metapodal plates; *4* — seta D6; *5* — chelicerae; *6* — spermatheca.

Рис. 4. *Typhloctonus tuberculatus*, ♀: — *1* — спинной щит; *2* — фрагмент вентральной стороны идиосомы; *3* — метаподальные щитки; *4* — щетинка D6; *5* — хелицера; *6* — сперматека.

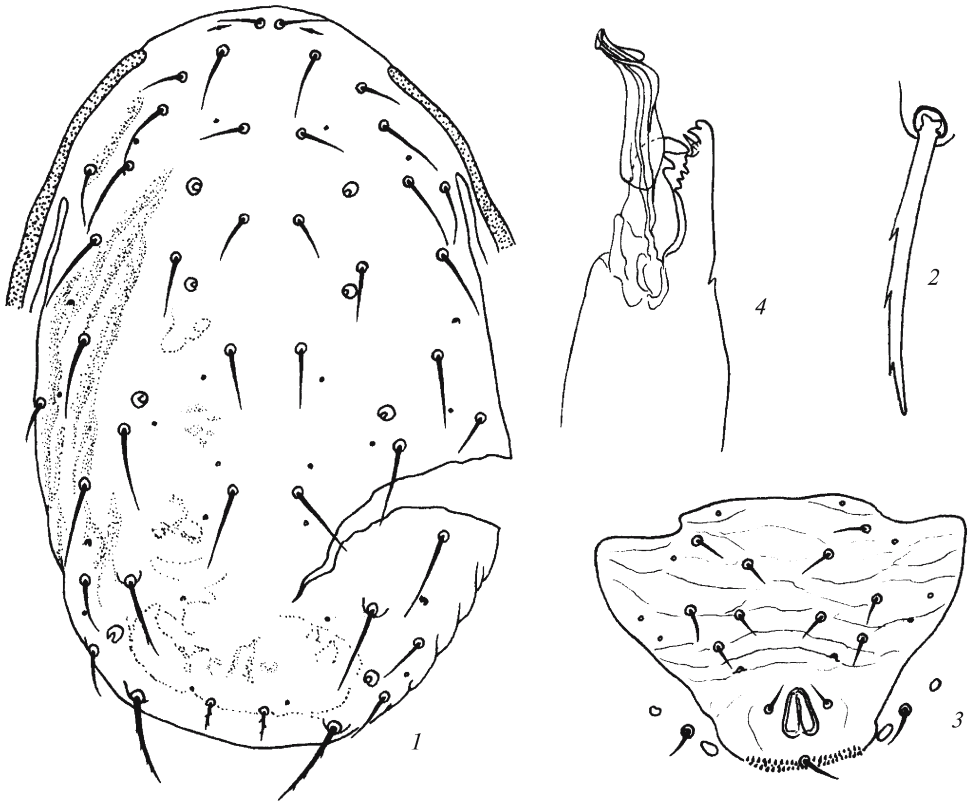

Fig. 5. *Typhloctonus tuberculatus*, ♂: *1* — dorsal shield; *2* — seta PM3; *3* — ventrianal shield; *4* — chelicera and spermatodactil.

Рис 5. *Typhloctonus tuberculatus*, ♂: *1* — спинной щит; *2* — seta PM3; *3* — вентроанальный щит; *4* — хелицера и сперматодактиль.

tomes (iv, id, il, ic very large, rounded; is — missing). Dorsal setae short, setae D6 and PM3 serrated, other setae smooth. Setae AM1 equal in length or somewhat longer then distance from their thecae to thecae of setae AL1. Setae PL1 and PM2 virtually equal in length. Peritremes reach to level of setae AM1. Sternal shield (fig. 4, *2*) with 2 pairs of setae, setae ST3 sit on small plates. Ventrianal shield near square in form with 4 pairs preanal setae. Anal pores small and wide placed. Chelicerae with 4 to 6 small denticles on Df and with 2 on Dm (fig. 4, *5*). Funnel of spermatheca cup-shaped, athrium sedentary (fig. 4, *6*). Macrosetae on legs missing.

Measurements: Lds 375, Wds 210; Lvas 117, Wvas 100; Lian 55; Lt 80; D1 17; D2, D3 13; D4, PL2 19; D5 23; D6 12; AM1 25; AM2 15; AL1 16; AL2, AL3, PL126; AL4 27; AL5 24; ML 21; PL3 17; PM2 27; PM3 46; AS 20; PS 20; PV 13.

Male. Dorsal setae relatively longer then those in female. Dorsal solenostome *is* present and small. Ventrianal shield with 5 pairs preanal setae and distinct wide straddling anal pores. Spermatodactyle L−shaped. Lds 250−270.

Measurements: Lds 260, Wds 145; Lvas 147, Wvas 197; Lian 53; Lt 92; D1 13; D2, D3 13; AL1, PL3, AS, PS, PV 16; D4 26; D5 30; D6 10; 23; AM1 22; AM2 21; AL2 25; AL3 27; AL4 28; AL5, PL1 29; ML 30; PL2 19; PM2 31−32; PM3 30−31.

Distribution. This species looks like a mountain form. *Typhloctonus tuberculatus* (Wainstein) was described from high-mountain west part of Georgia (Wainstein, 1958). There are two females of this species from Caucasus Mountains (Engelman clearing, Caucasus Natural Reserve, Krasnodar region, col. Kruglikov) in my collection.

In Ukraine *T. tuberculatus* occurs in Crimia Mountains (1-st range) on trees (maple *Acer stevenii* Pojark.) and occasionally on herbage (Kolodochka, 1981; Kuznetsov, 1984). Later it was found on maple *A. pseudoplatanus* L. in mt. Bozhia (Kremenets Mountains — near Berezhkovtsy vallage, Kremenets region, Ternopol district, col. L. Kolodochka).

Notes. I have examined the specimen from Kishineu (Moldova) which previously was misidentified as *T. tuberculatus* (Wainstein, 1973) but actually it belongs to *T. aceri*. The find of *T. tuberculatus* in Azerbaijan was based on a misidentification of *T. aceri* too (Abbasova, 1972).

Re-examination of the slide containing the holotype of *Seiulus* (*Typhloctonus*) *arutunjani* Kuznetsov, 1984 revealed that the slide really contains 2 individuals of mites but not two females *arutunjani* as it was reported in the original description. In fact, the holotype of *arutunjani* and female of *Paraseiulus incognitus* Wainstein et Arutunjan. 1967 had been mounted in the slide.

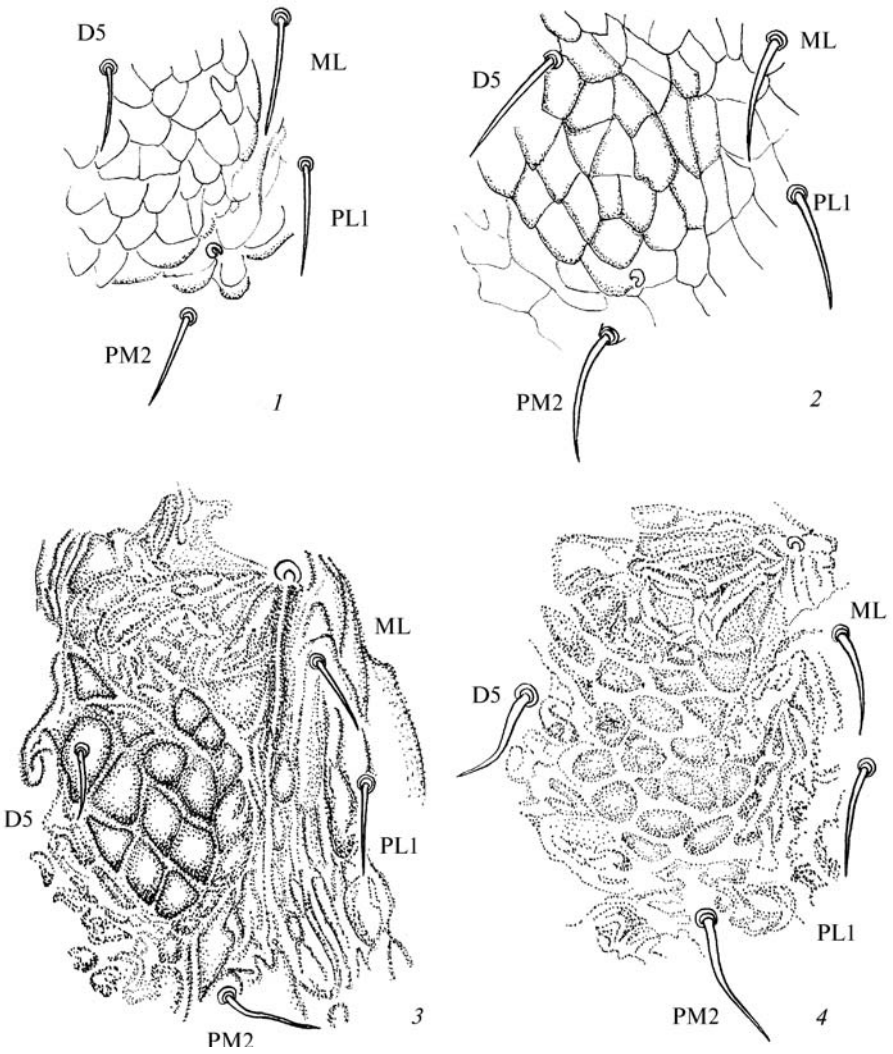

Fig. 6. Parts of female dorsal shields in four species of the genus *Typhloctonus*: *1 — T. tiliarum, 2 — T. aceri, 3 — T. runiacus, 4 — T. tuberculatus.*

Рис. 6. Участки поверхности дорсального щита самок четырех видов рода *Typhloctonus*: *1 — T. tiliarum, 2 — T. aceri, 3 — T. runiacus, 4 — T. tuberculatus.*

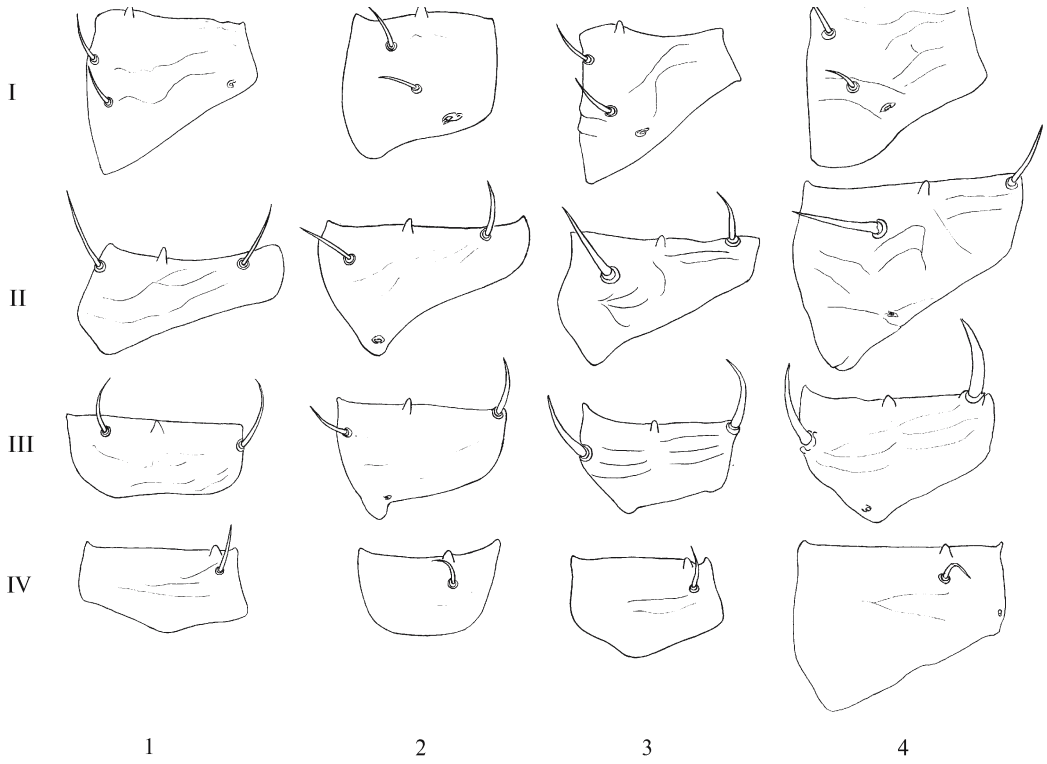

Fig. 7. Coxae in four species of the genus *Typhloctonus*: I–IV — coxae of legs I–IV (view on ventral surface right coxae): *1 — T. tiliarum, 2 — T. aceri, 3 — T. runiacus, 4 — T. tuberculatus.*

Рис. 7. Коксы четырех видов рода *Typhloctonus*: I–IV — коксы ног I–IV (вид на вентральную поверхность правых кокс): *1 — T. tiliarum, 2 — T. aceri, 3 — T. runiacus, 4 — T. tuberculatus.*

The holotype of *S. arutunjani* was not flattened when the slide was mounted therefore its body take the form of a gutter especially at the front part of body. Therefore sternal shield of *S. arutunjani* on fig. in 10 the original description unusually narrowed as well cuticle on ventral part of the opistosoma formed some deep wrinkles. Thus Kuznetsov dealt with misshapen specimen of *T. tuberculatus*. The admission of this fact allows to consider *S. arutunjani* as the junior synonym of *T. tuberculatus*.

The comparison of the revised holotype of *S. arutunjani* with the type material of *T. tuberculatus* shows their high similarity. According to the text and drawings of the first description *S. arutunjani* differs from *T. tuberculatus* only by the absence of one pair of setae MV2. In fact, one seta MV2 is present on membrane at the left side of the holotype's opistosoma. It lies hidden in depth of cuticular wrinkle on surface near ventrianal shield. Other seta MV2 is missing.

Thus there are 4 species of the genus *Typhloctonus* in Ukrainian fauna now. These species differ not only by features which above indicated but by some additional characters.

For example, the surface of dorsal shield in each *Typhloctonus* species has different sculpture: net-like in *T. tiliarum,* bulged net-like in *T. aceri,* middle tuberculous in *T. tuberculatus,* and legible tuberculous in *T. runiacus* (fig. 6, *1–4*).

In addition, *T. tubercalatus* and especially *T. runiacus* have strong setae on ventral surface of the coxae II and III. The seta on front margin of coxa III in *T. runiacus* is thorn-like (fig. 7, III, 4).

Key to species of the genus *Typhloctonus* (females)
Таблица для определения видов рода *Typhloctonus* (по самкам)

(4). Solenostome *is* on dorsal shield present. 2
(3). Ventrianal shield narrow. Anal pores missing. ..... *T. tiliarum* (Oudemans)
(2). Ventrianal shield square. Anal pores low and wide straddling. .... *T. aceri* (Collyer)
(1). Solenostome *is* absent. 5
(6). All solenostomes on dorsal shield middle in size. Dorsal setae thickened. Anterior metapodal plate near two times shorter then posterior metapodal plate. .... *T. runiacus* Kolodochka
(5). Solenostomes *iv, id, il* on dorsal shield large. Dorsal setae thin and needle-shaped. Anterior metapodal plate near three times shorter then posterior metapodal plate. ..... *T. tuberculatus* (Wainstein)

Abbasova E. J. Phytoseiid mites (Parasitiformes, Phytoseiidae) of Azerbaijan : Abstract of dissertation ... cand. biol. nauk. — Baku, 1972. — 34 p. — Russian.

Akimov I. A., Kolodochka L. A. Phytoseiid mites (Gamasoidea, Phytoseiidae) of the Central Steppe-Forest UkrSSR which inhabit in colonies of Spider mites // Thesis of the II-nd Acarological council (Kiev, 1970). — Kyiv : Naukova Dumka, 1970. — Part I. — P. 15–16. — Russian.

Beglarov G. A., Malov N. A. Predaceous phytoseiid mites (Phytoseiidae, Parasitiformes) in fauna of Moldova and North Bukovina (Report 2) // Khistchniki i parazity vreditelej rastenij. — Kishinev : Shtiintsa, 1977. — P. 3–11. — Russian.

Chant D. A. Phytoseiid mites (Acarina: Phytoseiidae). Part I. Bionomics of seven species in southeastern England. Part II. A taxonomic review of the family Phytoseiidae, with descriptions of 38 new species // Canad. Entomol. — 1959. — **91**, Suppl. 12. — P. 45–164.

Chant D. A., McMurtry J. A. Illustrated Keys And Diagnoses For The Genera And Subgenera Of The Phytoseiidae of the World (Acari: Mesostigmata). — West Bloomenfield (U. S. A.) : Indira Publishing House, 2007. — 220 p.

Denmark H. A., Rather *A. Q.* Revision of the genus Typhloctonus Muma, 1961 (Acarina, Mesostigmata) // Int. J. Acarol. — 1984. — **10**. — P. 163–177.

Collyer E. Two new species of the genus Typhlodromus Scheuten, 1857 (Acarina: Phytoseiidae). // Ann. Mag. Nat. Hist. — 1957. — **12**. — P. 199–203.

Hirschmann W. Gangsystematik der Parasitiformes // Acarol. Schriftenreihe fur Vergleichende Milbenkunde. — Hirschmann — Verlag. — Furth/Bay. — 1962. — **5** (5–6). — 80 S., 32 plates.

Kolodochka L. A. Predaceous phytoseiid mites (Parasitiformes, Phytoseiidae) of the Forest-Steppe UkrSSR. Report II. Species of the genera Kampimodromus, Paraseiulus, Typhlodromus, Typhloctonus, Anthoseius, Phytoseius // Vestnik zoologii. — 1974. — N 1. — P. 25–29. — Russian.

Kolodochka L. A. New species of phytoseiid mites of the fauna USSR (Parasitiformes, Phytoseiidae) // Vestnik zoologii. — 1980. — N 2. — P. 64–70. — Russian.

Kolodochka L. A. New phytoseiid mites of Crimea (Parasitiformes, Phytoseiidae). Communication 1 // Vestnik zoologii. — 1981. — N 1. — P. 18–22. — Russian.

Kolodochka L. A. About taxonomic status of two species of the genus Typhloctonus (Parasitiformes, Phytoseiidae) // Vestnik zoologii. — 1986. — N 2. — P. 26–34. — Russian.

Kolodochka L. A. New in structure of spermatheca in females of phytoseiid (Parasitiformes, Phytoseiidae) // Vestnik zoologii. — 1990. — N 1. — P. 74–75. — Russian.

Kolodochka L. A. Phytoseiid Mites of the Palaearctic Region (Parasitiformes, Phytoseiidae): faunistics, taxonomi, ecomorphology, evolution / Ed. I. A. Akimov ; I. I. Schmalghausen' Institute NAS of Ukraine. — Vestnik zoologii. — 2006. — Suppl. 21. — 250 p., 68 ill., 11 tabl., 316 bibl. — Russian.

Kuznetsov N. N. New species of predaceous mites of the family Phytoseiidae (Parasitiformes) of the fauna of the USSR. — Entomol. Obozrenije. — 1984. — **63**, 2. — P. 384–397. — Russian.

Livshits I. Z., Kuznetsov N. N. To knowledge of Phytoseiids of Crimea // Proceeding of the State Nikitskogo Botanicheskogo Sada. — 1972. — **61**. — P. 13–64. — Russian.

Moraes G. J., de, McMurtry J. A,, Denmark H. A., Campos C. B. A revised catalog of the family Phytoseiidae // Zootaxa 434. — Auckland (New Zealand) : Magnolia Press, 2004. — 494 p.; 30 cm.

Wainstein B. A. New species of the genus Typhlodromus (Parasitiformes, Phytoseiidae) from Georgia // Soobstchenia AN Gruzinskoj SSR. — 1958. — **21**, N 2. — S. 201–207. — Russian.

Wainstein B. A. Predaceous mites of the family Phytoseiidae (Parasitiformes) in the fauna of Moldavian SSR // Fauna and biology of the insects of Moldavia. — Kishinev : Shtiintsa, 1973. — P. 176–180. — Russian.