

Species of the genus *Trionymus* from Russia and neighbouring countries (Homoptera, Coccinea: Pseudococcidae)

E.M. Danzig

Danzig, E.M. 1997. Species of the genus *Trionymus* from Russia and neighbouring countries (Homoptera, Coccinea: Pseudococcidae). *Zoosystematica Rossica*, 6(1/2): 95-114.

A key and annotated list of 26 species of *Trionymus* are presented. 10 little known species are redescribed and 9 of them illustrated, for most of these species illustrations of general view are given for the first time. Lectotypes are designated for 16 nominal species. The following new synonymies are established: *T. perrisii* (Sign.) = *graminellus* (Borchs.), *T. phalaridis* (Green) = *luzensis* Komosińska, *T. hamberdi* (Borchs.) = *gracilipes* (Borchs.), *subradicum* Danzig, *T. multivorus* (Kir.) = *elymus* (Borchs.), *T. levis* Borchs. = *aberrans* Danzig, *T. subterraneus* (Newst.) = *parvus* (Borchs.).

E.M. Danzig, Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St. Petersburg 199034, Russia.

Introduction

Trionymus Berg is very close to *Dysmicoccus* Ferris. Most workers have followed the definition of the genus by McKenzie (1967) and his concept is followed here. McKenzie placed the species with 6 or more pairs of cerarii in *Dysmicoccus* and those with 5 or fewer in *Trionymus*. All cerarii of *Trionymus* possess 2 conical setae only, whereas in *Dysmicoccus* at least some cerarii bear more than 2 conical setae. Difficulties arise with placement of some species. *T. multivorus* possesses 2-6 (rarely up to 10) pairs of cerarii, but variability in number of cerarii permits us to place this species in *Trionymus*. We also include *T. placatus* in this genus though in contrast to other species of this genus it has 2 pairs of cerarii on head additional to 2 abdominal pairs.

The genus is worldwide in distribution. It includes more than 100 species (Ben-Dov, 1994), 26 of them in Russia and former republics of the USSR. *Pseudococcus latvicus* Rasiņa, *P. paludicola* Rasiņa and *P. pseudoperrisii* Rasiņa (Rasiņa, 1966, 1971) apparently belong to *Trionymus*. The types of these species have been deposited in the collection of the former Institute of Plant Protection in Riga (Latvia). The author did not

examine these species, and the descriptions do not allow him to conclude on their identity. *T. phragmitis* (Hall) was recorded erroneously from the Ukraine (Kiritshenko, 1936; Borchsenius, 1949; Tereznikova, 1975). Material of Kiritshenko and Borchsenius belongs to *T. isfarensis*. The illustration and description of Tereznikova refer to *Neotrionymus monstator* Borchs.

T. teberdae Danzig and *T. subalpinus* Danzig described in *Trionymus* (Danzig, 1985) are transferred to the genus *Mirococcopsis* Borchs.: *M. teberdae* (Danzig), **comb. n.** and *M. subalpinus* (Danzig), **comb. n.**

Most of species of *Trionymus* are living on grasses, rarely they are found on *Iris* and *Carex*. The insects occur on leaf sheaths, sometimes on roots or leaves, some species are associated with perennial herbaceous dicots. One species lives on *Fagus*, but it is possibly not related to other species (Williams, 1962).

Key to species of the genus *Trionymus*

- 1(2). Anal ring horseshoe-shaped 25. *T. aberrans* Goux
- 2(1). Anal ring oval or round.
- 3(4). Minute simple pores clustered near hind coxae 26. *T. isfarensis* (Borchs.)
- 4(3). Such pores absent.

- 5(22). Multilocular pores arranged in groups along body margin, often these groups interflow in marginal band.
- 6(19). Circulus present.
- 7(10). C_{18} with 6 or more auxiliary setae, borne on a large sclerotized plate.
- 8(9). C_{18} with stout conical setae 1. **T. implicatus** (Borchs.)
- 9(8). C_{18} with slender conical setae 2. **T. kirgisicus** (Borchs.)
- 10(7). C_{18} with 1-3 auxiliary setae, not borne on sclerotized plate, sometimes only a weak sclerotization present.
- 11(18). Tubular ducts and multilocular pores present on dorsum. Circulus flat.
- 12(17). Tubular ducts and multilocular pores present on frontal margin of dorsum (4 poorly distinguished species: *T. hamberdi*, *T. kurilensis*, *T. boratynskii* and *T. ferganensis*)
- 13(16). Band of tubular ducts and multilocular pores on dorsum interrupted in the middle of thorax. Hind tibia without translucent pores on the tip.
- 14(15). Multilocular pores present on medial areas of head and thorax . . . 10. **T. hamberdi** (Borchs.)
- 15(14). Multilocular pores absent from medial areas of head and thorax 11. **T. kurilensis** Danzig
- 16(13). Band of tubular ducts and multilocular pores on dorsum not interrupted in the middle of thorax. Hind tibia with a group of translucent pores on the tip 12. **T. boratynskii** Danzig
- 17(12). Tubular ducts and multilocular pores absent from frontal margin of dorsum 13. **T. ferganensis** (Borchs.)
- 18(11). Tubular ducts and multilocular pores absent from dorsum. Circulus convex 14. **T. mongolicus** Danzig
- 19(6). Circulus absent.
- 20(21). Tubular ducts of larger type numerous. 2 pairs of cerarii; C_{18} with 2 stout conical setae, 10-12 auxiliary setae and numerous trilocular pores, borne on sclerotized plate 3. **T. calamagrostidis** Borchs.
- 21(20). Tubular ducts of larger type on body margin only. One pair of cerarii; C_{18} with slender conical setae, 3-4 auxiliary setae and several trilocular pores, not borne on sclerotized plate, with weak sclerotization around conical setae only.
- 22(5). Marginal groups of multilocular pores absent.
- 23(38). C_{18} borne on large sclerotized plate.
- 24(33). Body elongate, sides subparallel. Hind coxae with translucent pores.
- 25(26). 2 pairs of cerarii present on anterior body margin. Most of dorsal tubular ducts accompanied by a long seta 5. **T. placatus** (Borchs.)
- 26(25). Cerarii absent from anterior body margin. Dorsal tubular ducts not accompanied by setae.
- 27(32). Circulus present. Multilocular pores numerous on 5 posterior abdominal sternites and sparse on other parts of body.
- 28(31). Circulus (sometimes 2 or more) small, round or oval, not divided by an intersegmental fold.
- 29(30). Anal lobe cerarian plate not larger or only slightly larger than area of anal ring 6. **T. perrisii** (Sign.)
- 30(29). Anal lobe cerarian plate considerably larger than area of anal ring . . . 7. **T. phalaridis** (Green)
- 31(28). Circulus large, divided by an intersegmental fold 8. **T. tomlini** Green
- 32(27). Circulus absent. Multilocular pores on 4 last abdominal sternites only, not numerous 9. **T. vaginatus** Mat.
- 33(24). Body oval. Hind coxae without translucent pores.
- 34(37). Body margin with clusters of very long setae, particularly in cerarii. Often all body setae long and strong. Circulus absent. Tubular ducts not clustered.
- 35(36). Body orange. On Asteraceae and other dicotyledonous herbs 15. **T. multisetiger** (Borchs.)
- 36(35). Body white. On *Iris uniflora* 16. **T. iridis** Danzig
- 37(34). Marginal setal clusters absent. Body setae of normal length. Circulus absent or present. Tubular ducts usually in clusters of 1-4 larger and 1 small ones 17. **T. multivorus** (Kir.)
- 38(23). C_{18} not borne on sclerotized plate.
- 39(46). Tubular ducts numerous on dorsum.
- 40(41). Circulus large and quadrate; 4 or 5 pairs of cerarii present 18. **T. newsteadi** (Green)
- 41(40). Circulus absent or small and oval. 1-2 pairs of cerarii present.
- 42(45). Circulus absent. Dorsal tubular ducts of larger type only.
- 43(44). Antennae and legs short, antennae 6-7-segmented. Tubular ducts arranged in transverse bands. Body contents not showing black pigment when placed in alcohol or potash 19. **T. artemisiarum** (Borchs.)
- 44(43). Antennae and legs long, antennae 8-segmented. Tubular ducts on dorsum arranged in transverse rows. Body content showing a black pigment when placed in alcohol or potash 20. **T. levis** (Borchs.)
- 45(42). Circulus present. Dorsal tubular ducts mostly of smaller type 21. **T. turgidus** (Borchs.)
- 46(39). Tubular ducts either absent entirely from dorsum or present on the margin only.
- 47(50). 4 or 5 pairs of cerarii present. Tubular ducts wide.
- 48(49). Circulus present. Multilocular pores and tubular ducts on 4 posterior segments of venter 23. **T. parvaster** Danzig
- 49(48). Circulus absent. Multilocular pores and tubular ducts numerous on all abdominal venter 22. **T. dilatatus** Danzig
- 50(47). 1 pair of cerarii present. Tubular ducts narrow 24. **T. subterraneus** (Newst.)

1. *Trionymus implicatus* (Borchsenius, 1949) (Fig. 1)

Borchsenius, 1949: 144 (*Pseudococcus*; Kazakhstan: Aktyubinsk Prov.; lectotype, designated here: ♀, "*Pseudococcus implicatus* Borchs., Alga, Aktyubinsk Distr., 25.VIII.1936, N. Borchsenius, No. 38", slide No. 132-36, on the same slide 1 ♀ of *T. aberrans* Goux present; paralectotypes: 2 ♀ with the

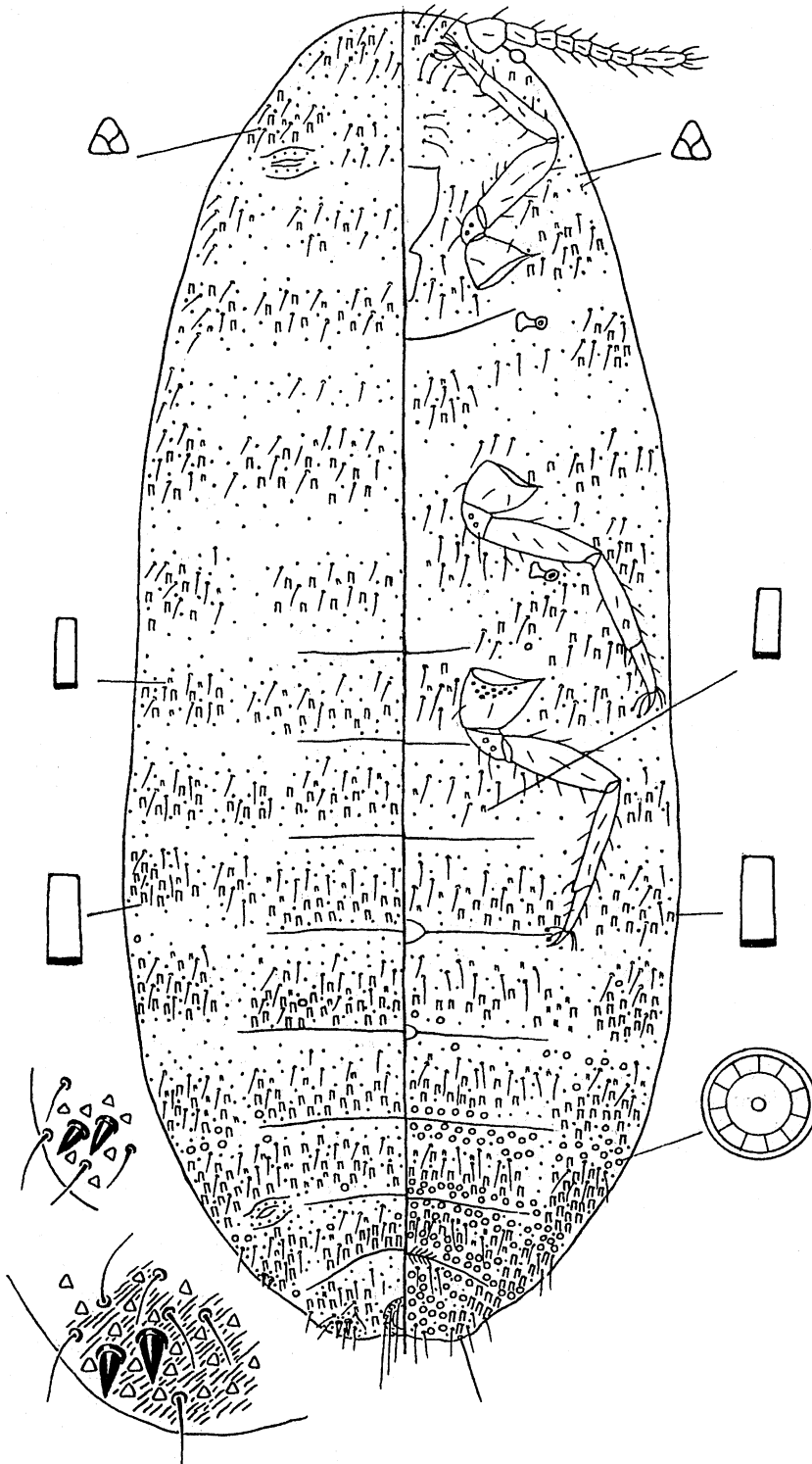


Fig. 1. *Trionymus implicatus* (Borchs.), female, lectotype.

same data, but with indication of the host-plant, *Agropyron cristatum*); Matesova, 1968a: 104.

Material. Types and 5 ♀ from E. Kazakhstan.

Description. Female. Body elongate, pinkish or dark crimson; 2.5 mm. Antennae 8-segmented. Hind coxae with translucent pores. Circuli one or two, rather small. Multilocular pores on dorsum sparse on IV-VII segments; on venter sparse on head and thorax, forming groups on margin of V-VII and transverse rows and bands on VI-VIII segments. Tubular ducts of two sizes, form a marginal band, on dorsum arranged in transverse bands on thorax and abdomen, on venter form transverse bands on abdomen, sparse in the middle of thorax. Cerarii on last 2 segments only. C₁₈ with 2 stout conical setae, 6-9 auxiliary setae and group of trilocular pores, on a sclerotized plate. C₁₇ with 2 stout conical setae, 1-4 auxiliary setae and several trilocular pores.

Variation. Number of circuli shows individual variation. The lectotype has 2 circuli, paralectotypes have 1. Of the 5 females from E. Kazakhstan one has 2 circuli and four have 1.

Distribution. Kazakhstan.

Host plants. Living on roots and lower part of stem on *Poa stepposa*, *Phleum phleoides*, *Agropyron cristatum*.

2. *Trionymus kirgisicus* (Borchsenius, 1949)

Borchsenius, 1949: 141 (*Pseudococcus*; Kirghizia: Fergana Range; lectotype, designated here: ♀, "*Pseudococcus kirgisicus* Borchs., on *Elymus*, locality Malyi Urtak, Kugartka valley, Kirghizia, 24.VII.1937, N. Borchsenius, t. 29", slide No. 5-38); Matesova, 1968a: 104.

Material. Lectotype.

Comments. Very similar to *T. implicatus* and possibly identical with it, differs in the slender cerarian setae of C₁₈. Available material (1 female in bad condition) does not allow us to suggest more definite opinion about the status of this species.

Distribution. Kirghizia (Fergana Range), E. Kazakhstan.

Host plants. Living on the sheaths of leaves on *Elymus*, *Poa pratensis*, on roots of *Phleum phleoides*.

3. *Trionymus calamagrostidis* (Borchsenius, 1949)

(Fig. 2)

Borchsenius, 1949: 143 (*Pseudococcus*; Kirghizia: lectotype, designated here: ♀, "*Pseudococcus ca-*

lamagrostidis Borchs., bank of Kugartka River, 35 km of Dzh[alal-Abad], Kirghizia, 1.VIII.1937, N. Borchsenius. No. 11, t. 32", slide No. 7-38, specimen in black circle; paralectotypes: 6 ♀ from the same series); Matesova, 1968a: 103.

Material. Types and one series from the Pamirs.

Description. Female. Body elongate, pale pinkish; 4 mm. Antennae 8-segmented. Hind coxae with translucent pores. Circulus absent. Multilocular pores on dorsum forming marginal groups on IV-VI and transverse rows on IV-VI segments, on venter forming marginal band along all body, transverse rows on IV-VII and band on VIII segments, sparse in the middle of thorax. Tubular ducts of two sizes, arranged in a marginal band, on dorsum forming transverse rows on thorax and abdomen, on venter forming transverse rows on abdomen, sparse on medial thorax. Cerarii on last 2 segments only. C₁₈ with 2 stout conical setae, 10-12 auxiliary setae and numerous trilocular pores, on large sclerotized plate. C₁₇ with 2 shorter conical setae, 2 auxiliary setae and several trilocular pores.

Distribution. E. Kazakhstan, Kirghizia, Tadzhikistan (Pamirs).

Host plants. Living on the leaf sheaths close to roots under ground, on *Calamagrostis*, *Poa stepposa*, *Phleum phleoides* and *Phragmites australis*. Sometimes injurious (Matesova, 1968a).

4. *Trionymus copiosus* (Borchsenius, 1949)

(Fig. 3)

Borchsenius, 1949: 156 (*Pseudococcus*; Tadzhikistan: Khodzhen Distr.; lectotype, designated here: ♀, "*Pseudococcus copiosus* Borchs., on leaves of grass (*Alopecurus*), Tadzhikistan, near Nau, 3.IX.1944, Arnoldi. No. 297", slide No. 1-44, specimen in black circle; paralectotypes: 8 ♀ of the same series.

Material. Types and 12 series from localities referred to below.

Description. Female. Body oval, pinkish; 2 mm. Antennae 6-7-segmented. Legs slender, with very narrow claws. Hind coxae with translucent pores. Circulus absent. Multilocular pores on dorsum sparse along margin of abdomen and in the middle of V-VI segments, on venter arranged in more or less dense band along body margin and transverse rows and bands on III-VIII segments. Tubular ducts of small type generally scattered on both surfaces, except dorsal pro- and metathorax. One pair of cerarii only. C₁₈ with 2 slender conical setae, 3-4

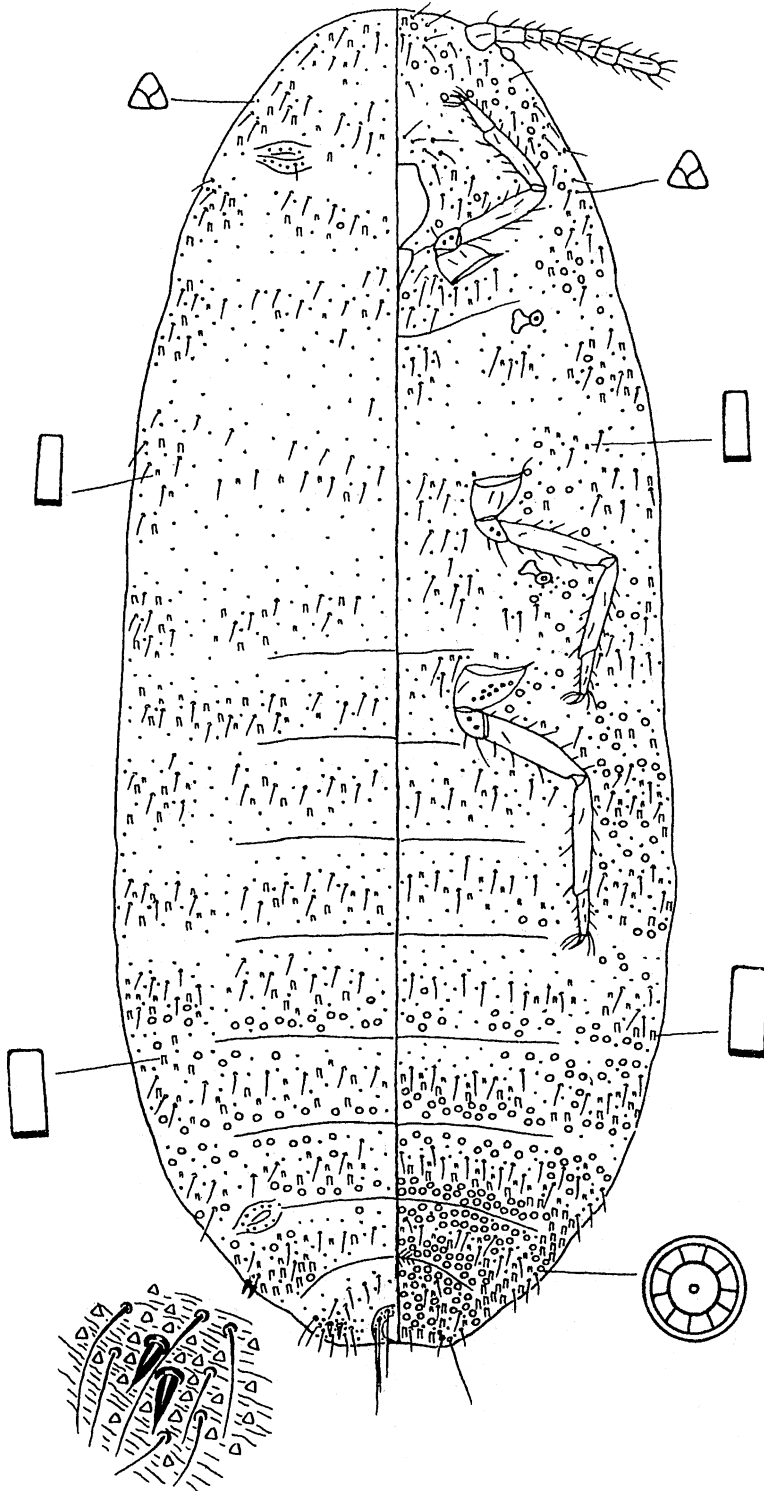


Fig. 2. *Trionymus calamagrostidis* (Borchs.), female, lectotype.

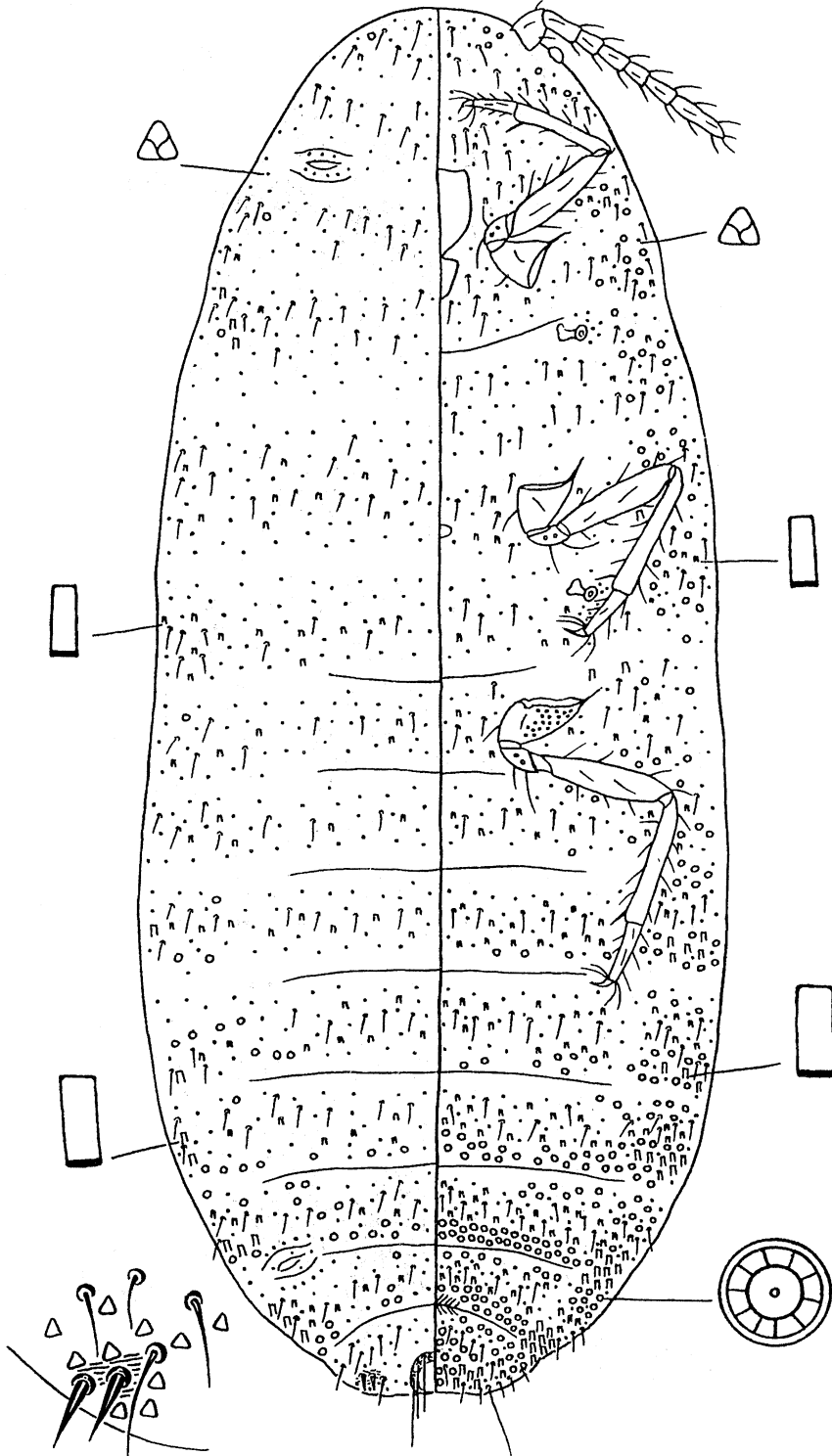


Fig. 3. *Trionymus copiosus* (Borchs.), female, Turkmenistan.

auxiliary setae and several trilocular pores, small area around the setae poorly sclerotized.

Variation. Specimens from *Phragmites* (Fig. 3) (10 series from Turkmenistan and 2 females from Tadjikistan) have distinctly more multilocular pores along the margin of prosoma than specimens from other grasses (2 series from Tadjikistan, including types). But the number of pores in multiporal series shows individual variation. This variation and absence of other differences do not allowed us to consider insects from *Phragmites* as separate species.

Distribution. Turkmenistan (Ashkhabad, Deynau, Chardzhou), Tadjikistan (Khodzhenst Distr. near Nau, Shaartuz in Kafirni-gan valley).

Host plants. Living on leaves of grasses. Was described from *Alopecurus*, there is one series from undetermined grass. All other insects (10 series) were collected from *Phragmites australis*.

5. *Trionymus placatus* (Borchsenius, 1949) (Fig. 4)

Borchsenius, 1949: 158 (*Pseudococcus*; Ukraine: Khmel'nitskiy Prov.; lectotype, designated here: ♀, "Gorodok, 6.VII.1904, Nasonov, t. 58", slide No. 308-39"); Tereznikova, 1975: 270; Kosztarab & Kozár, 1988: 166.

Material. In addition to the lectotype, 10 series from Russia.

Description. Female. Body elongate, pinkish; 4 mm. Antennae 8-segmented. Hind coxae without pores. Circulus large, oval. Multilocular pores on dorsum either absent entirely or a few on abdomen, on venter on 5 last segments only, sometimes a few also present on thorax. Tubular ducts of three sizes. Ducts unusual of larger type with sclerotized collar on dorsum only, forming groups on abdominal margin, large group on frontal body margin, transverse rows on thorax and abdomen, except segment VIII; most of them accompanied by long slender setae. Ducts usual of larger type on 5 last abdominal segments of venter, particularly on margin. Ducts of smaller type generally on venter, a few also on dorsum. Cerarii numbering 4 pairs: C₁, C₃, C₁₇, C₁₈. C₁₈ with 2 stout conical setae, 9-13 long auxiliary setae and numerous trilocular pores, on sclerotized plate. C₁₇ with 2 smaller cerarian setae and several trilocular pores. C₁ and C₃ with 2 slender setae and several trilocular pores. Ventral setae very strong.

Distribution. Russia: Kaliningrad and Leningrad provinces, N. Caucasus (Teberda); Ukraine (Khmel'nitskiy Prov.), Moldova.

Host plants. Living on leaves of grasses: *Calamagrostis lanceolata*, *Poa nemoralis*, *P. trivialis*, *Deschampsia caespitosa*, *Agrostis alba*, *Lolium perenne*.

6. *Trionymus perrisii* (Signoret, 1875)

Signoret, 1875: 337 (*Westwoodia*; France); Borchsenius, 1949: 142 (*Pseudococcus*); Williams, 1962: 63 (= *hibernicus* Newst.); Schmutterer, 1952: 404; Ter-Grigorian, 1973: 66; Tereznikova, 1975: 265; Danzig, 1980: 178; Kosztarab & Kozár, 1988: 164. – *hibernicus* Newstead, 1895: 167 (*Dactylopius*; Ireland). – *graminellus* Borchsenius, 1949: 145 (*Pseudococcus*; Russia: Leningrad Prov.; lectotype, designated here: ♀, "Pseudococcus graminellus Borchs., Luga, on leaf sheaths of grass, 4.VI.1908, Nasonov", slide No. 318-39, specimen in black circle; paralectotypes: 5 ♀ with identical label), **syn. n.** – *orientalis* Matesova, 1968a: 105, nom. nud., 1968b: 152 (E. Kazakhstan). – *matesovae* Kozár & Walter, 1985: 73 (replacement name for *T. orientalis* Matesova, nom. praecox., non Maskell, 1898).

Material. Types of *T. graminellus* and *T. matesovae*, 50 series from Russia and neighbouring countries, 10 series from England, Poland, Hungary and Mongolia.

Comments. The new synonymy has been established by comparison of types of *T. graminellus* with specimens from England identified by Dr. D.J. Williams and cited in his revision (Williams, 1962).

T. matesovae differs from females of *T. perrisii* from Europe and Siberia in the larger plate of C₁₈ with greater number of trilocular pores, and also in more numerous tubular ducts and multilocular pores on the body. But there is individual variation in the type series of *T. matesovae*: 7 specimens including the holotype have all characters of *T. matesovae*, but 1 specimen is a typical *T. perrisii*. In extensive material from the Far East we also find individual variability in these characters. Some specimens are as European *T. perrisii*. Other females have C₁₈ as in *T. matesovae*, but as to body pores and ducts, in some specimens of this group they are numerous (as in *T. matesovae*), whereas in the other they are few in number (as in *T. perrisii*), sometimes in the insects from one locality. This variability led us to conclude that *T. matesovae* is conspecific with *T. perrisii*.

Distribution. Russia: Kaliningrad and Leningrad provinces, N. Caucasus, Irkutsk Prov., Tuva, Yakutia, southern Primorsk

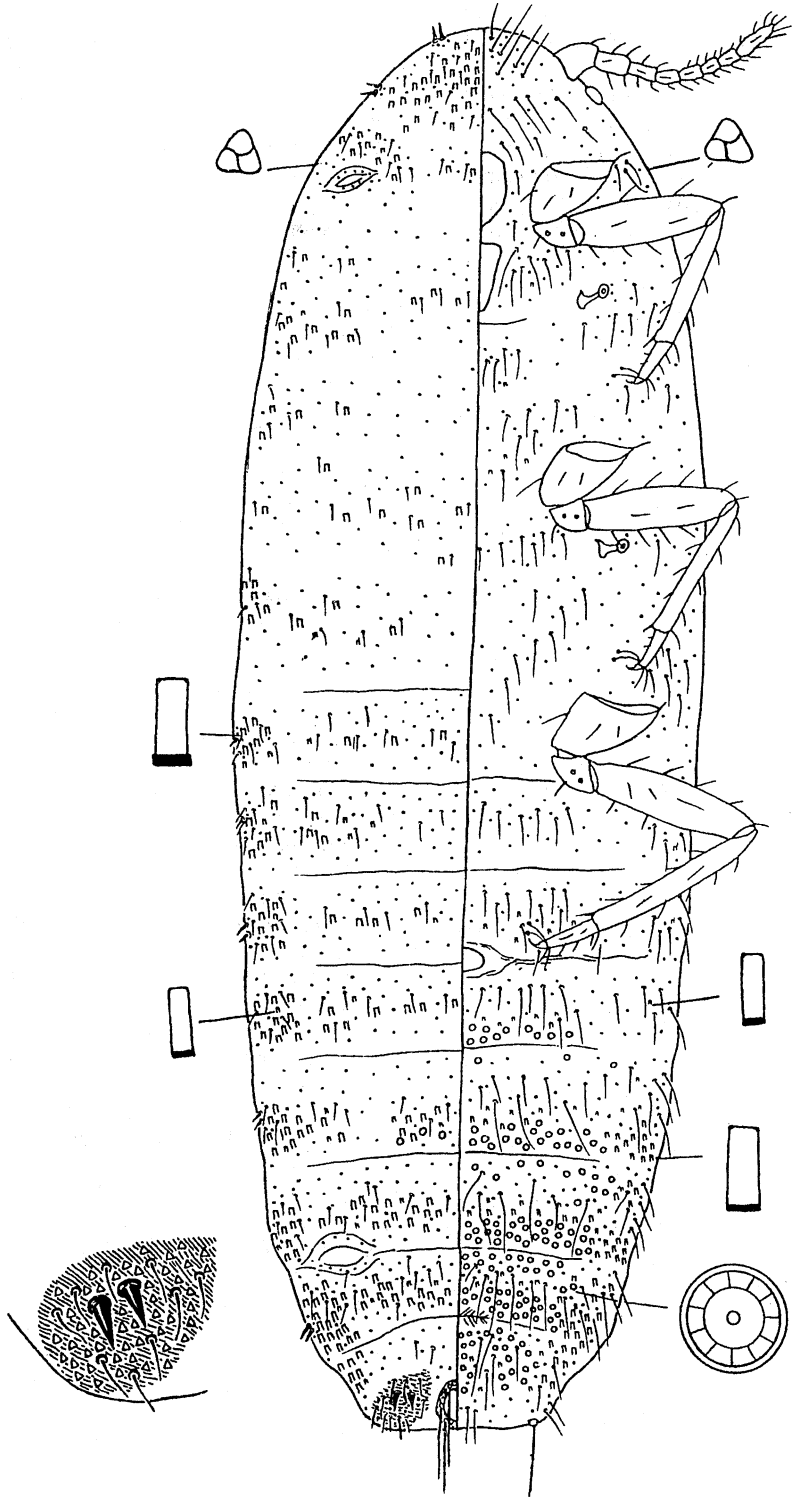


Fig. 4. *Trionymus placatus* (Borchs.), female, Kaliningrad Prov.

Terr., Sakhalin and Kunashir Islands; Ukraine, Armenia, Kazakhstan. Europe (widely distributed), Mongolia.

Host plants. Living on the leaf sheaths of grasses. In Russia most often occurring on *Calamagrostis*.

7. *Trionymus phalaridis* Green, 1925

Green, 1925: 37 [*Pseudococcus* (*Trionymus*); England]; Borchsenius, 1937: 45; 1949: 140 (*Pseudococcus*); Williams, 1962: 67; Kosztarab & Kozár, 1988: 165. – *californicus* (non Enhorn, 1911): Kiritshenko, 1931: 312 (see Borchsenius, 1949). – *festucae* Kir. (nom. nud.): Borchsenius, 1937: 184 (see Borchsenius, 1949). – *luzensis* Komosińska, 1980: 257 (Poland), *syn. n.*

Material. 4 females from England (probably type series according to remark of D. Williams on slides), paratypes of *T. luzensis* and 1 series from Leningrad Prov.

Comments. The new synonymy has been established by comparison of paratypes of *T. luzensis* with the redecription of *T. phalaridis* (Williams, 1962). Distinctions mentioned by Komosińska (1980) are within the range of intraspecific variation of *T. phalaridis*.

Distribution. Russia: Leningrad Prov. England, Poland. Records by Borchsenius (1937, 1949) of *T. phalaridis* from N. Caucasus and Ukraine are not confirmed by material.

Host plants. Living on the leaf sheaths and leaves of grasses, in Leningrad Prov. collected on *Poa nemoralis*.

8. *Trionymus tomlini* Green, 1925

Green, 1925: 525 [*Pseudococcus* (*Trionymus*); England]; Williams, 1962: 72; Kosztarab & Kozár, 1988: 169; Tang, 1992: 183.

Material. 9 series from Russia, Ukraine, Armenia and Kazakhstan, 6 females from England.

Distribution. Russia: Krasnodar Terr. (Temryuk and Gelendzhik Distr.), Omsk Prov.; Ukraine (Crimea), Armenia (Atmar Distr.), W. Kazakhstan. England, France, Hungary, Poland, Sweden, China.

Host plants. Living on the leaf sheaths of grasses and *Carex*.

9. *Trionymus vaginatus* Matesova, 1968

Matesova, 1968a: 105 (nom. nud.); 1968b: 151 (E. Kazakhstan: Kalbinsky Range).

Material. 5 females from Kalbinsky and 1 from Ubinsky Ranges.

Distribution. E. Kazakhstan: Kalbinsky and Ubinsky Ranges.

Host plants. Living on the sheaths of leaves of *Tragopogon* and *Arctium tomentosum*.

10. *Trionymus hamberdi* (Borchsenius, 1949) (Fig. 5)

Borchsenius, 1949: 154 (*Pseudococcus*; Armenia; *lectotype*, designated here: ♀, "*Pseudococcus hamberdi*, Armenia, Ashtarak Distr., locality Archashan near Amberd, on the leaf sheaths of *Phragmites*, 3.IX.1948, N. Borchsenius, N 656", slide No. 282-48; paralectotypes: 4 ♀ from lectotype series); Ter-Grigorian, 1966: 65; 1973: 70. – *gracilipes* Borchsenius, 1949: 155 (*Pseudococcus*; N. Caucasus; *lectotype*, designated here: ♀, "*Trionymus gracilipes*, N. Caucasus, Maykop Distr., Kamennomostskaya, bank of Belaya River, on grass No. 9, 7.VI.1934, t. 54, 70", slide without No., specimen in black circle; paralectotypes: 3 ♀ on the same slide), *syn. n.* – *subradicum* Danzig, 1985: 120 (N. Caucasus: Teberda), *syn. n.*

Material. Types of *T. hamberdi*, *T. gracilipes* and *T. radicum*, 1 series from Dagestan, 1 from Kazakhstan, 6 from Ukraine.

Description. Female. Body elongate, pinkish; 4 mm. Antennae 7-8-segmented. Legs slender, hind coxae with translucent pores. Circulus rather small, oval or quadrangular. Multilocular pores arranged in groups forming marginal band around body, sparse on dorsal prosoma, forming transverse rows and bands on V-VIII segments of dorsum and VI-VIII segments of venter. Tubular ducts short, of two sizes, situated within marginal band of multilocular pores, sparse in medial areas on both surfaces. 1 or 2 pairs of cerarii present. C₁₈ with 2 slender or stout conical setae, 2-3 auxiliary setae and group of loose trilocular pores. C₁₇ with shorter conical setae and 1 pore, in place of C₁₆ sometimes 1 conical seta present.

Comments. The synonymy of *T. gracilipes*, *T. subradicum* and *T. hamberdi* has been established by examination of types. Differences in the number of cerarii and types of conical setae of C₁₈ are within the range of intraspecific variation of *T. hamberdi*.

Distribution. Russia: Kaliningrad, Leningrad and Irkutsk provinces, N. Caucasus (Caucasian and Teberda nature reserve, Dagestan); Ukraine (Transcarpathia), W. Kazakhstan. Italy, Hungary, Poland.

Host plants. Living on the leaf sheaths of various grasses.

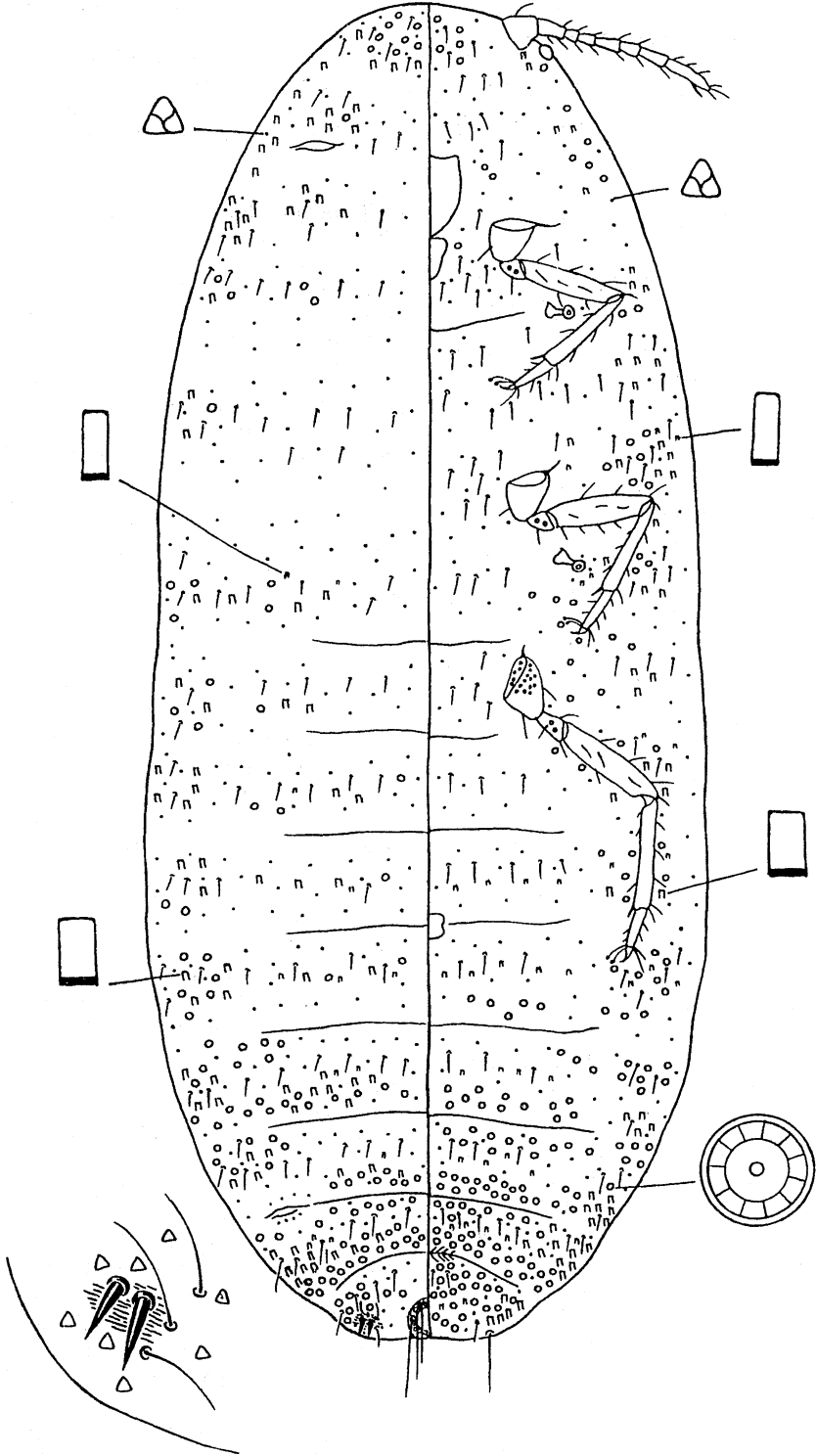


Fig. 5. *Trionymus hamberdi* (Borchs.), female, lectotype.

11. *Trionymus kurilensis* Danzig, 1986

Danzig, 1986: 75 (new replacement name). – *insularis* Danzig, 1983: 520 (nom. praeocc., non *T. insularis* Ehrhorn, 1916; Kuril Islands: Kunashir, Sernovodsk).

Material. Type series (from two localities).

Distribution. Known from the type series only.

Host plants. Living on the leaf sheaths of *Calamagrostis* and *Phargmites australis*.

12. *Trionymus boratynskii* Danzig, 1983

Danzig, 1983: 517.

Material. Types and 2 females from Khasan Lake.

Comments. Very close to *T. hamberdi*. Multilocular pores and tubular ducts more numerous, rows not interrupted in the middle of thorax.

Distribution. Primorsk Terr.

Host plants. Living on the sheaths of leaves of grasses near soil.

13. *Trionymus ferganensis* (Borchsenius, 1949) (Fig. 6)

Borchsenius, 1949: 155 (*Pseudococcus*; Kirghizia, Fergana Range; l e c t o t y p e, designated here: ♀, "*Pseudococcus ferganensis* Borchs., on *Calamagrostis* sp., bank of Kugartka River, 35 km of Dzh[alal-Abad], Kirghizia, I.VIII.1937, N. Borchsenius. No. 11, t. 31", slide No. 7-38, specimen in black circle; paralectotypes: 1 ♀ on the same slide).

Material. Types and 1 series from Tadzhikistan.

Description. Female. The species is very similar to *T. hamberdi*, it differs in the absence of multilocular pores and tubular ducts on anterior margin of dorsum. Antennae 7-segmented. One pair of cerarii only with 2 slender conical setae, 1-2 auxiliary setae and several trilocular pores.

Distribution. Kirghizia (Fergana Range), Tadzhikistan (Khodzhent Distr. near Nau).

Host plants. Living on the leaf sheaths of *Calamagrostis*.

14. *Trionymus mongolicus* Danzig, 1980

Danzig, 1980b: 36 (Mongolia: Khentei Aimak).

Material. Holotype.

Comments. *T. agropyronicola* Tang, 1988 was treated erroneously as synonym of *T. mongolicus* (Tang, 1992). It has tubular ducts on dorsum and differs in the composition of cerarii.

Distribution. Known from the holotype only.

Host plants. Living on *Carex*.

15. *Trionymus multisetiger* (Borchsenius, 1949)

Borchsenius, 1949: 137 (*Pseudococcus*; Altai and southern Primorsk Terr.); Danzig, 1980a: 180 (designated lectotype; = *hemisphaericus* Borchs., = *galatellus* Mat.); Tang, 1992: 174. – *hemisphaericus* Borchsenius, 1949: 147 (*Pseudococcus*; Primorsk Terr., Mikhaylovsk Distr., Grigor'evka); Danzig, 1980a: 180 (designated lectotype). – *galatellus* Matesova, 1957: 163 (*Pseudococcus*; E. Kazakhstan).

Material. Types of *T. multisetiger*, *T. hemisphaericus* and *T. galatellus*, 70 series from the Primorsk Terr., 3 from Mongolia, 7 from Korea, 3 from China.

Distribution. Russia: Altai, Tuva, southern Primorsk Terr. (widely distributed); Kazakhstan (Tien Shan: Zailiysk Alatau). E. Mongolia, Korea, China.

Host plants. Oligophagous on Asteraceae, living on roots. In Primorsk Terr., the species is common on *Artemisia*, *Taraxacum* and *Heteropappus*, but occurs also on *Aster*, *Chrysanthemum*, *Hypochaeris*, *Gerbera* and *Saussurea*. In the Altai it was collected from *Echinosperrum* and in the Tien Shan on *Galatella*. *T. hemisphaericus* was described from 1 female collected on roots of grass, apparently a case of mislabelling.

16. *Trionymus iridis* Danzig, 1971

Danzig, 1971: 369 (southern Primorsk Terr.: Pokrovka); 1980a: 181.

Material. Type series.

Comments. In microscopic characteristics, the species is indistinguishable from *T. multisetiger*, but the female has different colour, host plant and phenology.

Distribution. Pokrovka in Razdol'naya River valley.

Host plants. Living on roots of *Iris uniflora*.

17. *Trionymus multivorus* (Kiritshenko, 1936) (Fig. 7)

Kiritshenko, 1936: 151 [*Pseudococcus*; Ukraine, Armenia, Azerbaijan, Uzbekistan; l e c t o t y p e, designated here: ♀, "*Pseudococcus multivorus* mihi, on *Taraxacum*, Odessa, Alexis Kiritshenko det.", slide without No., specimen in black circle; paralectotypes: 14 slides from Russia (Rostov), Ukraine (including Crimea) and Azerbaijan]; 1940: 121 (*Pseudo-*

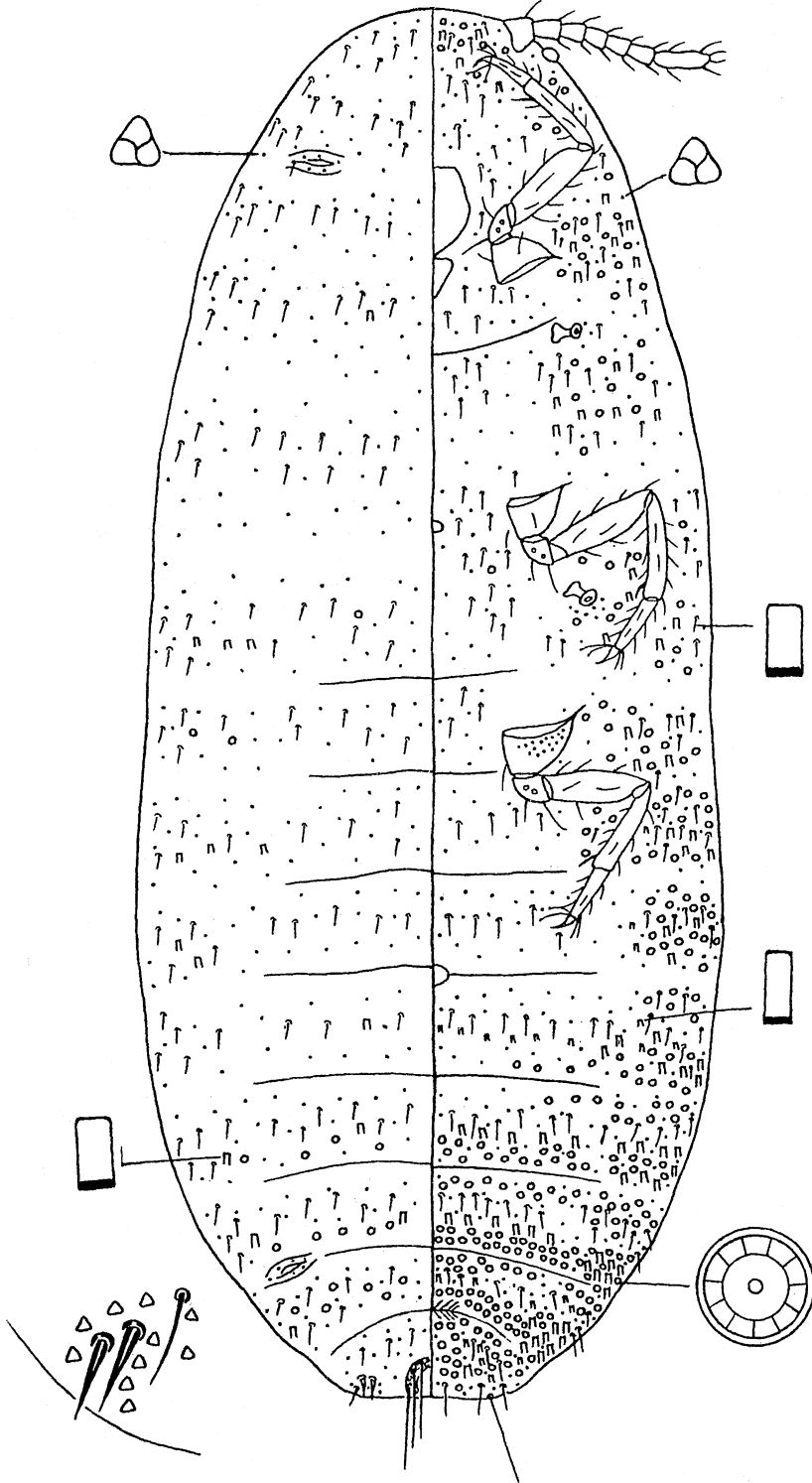


Fig. 6. *Trionymus ferganensis* (Borchs.), female, lectotype.

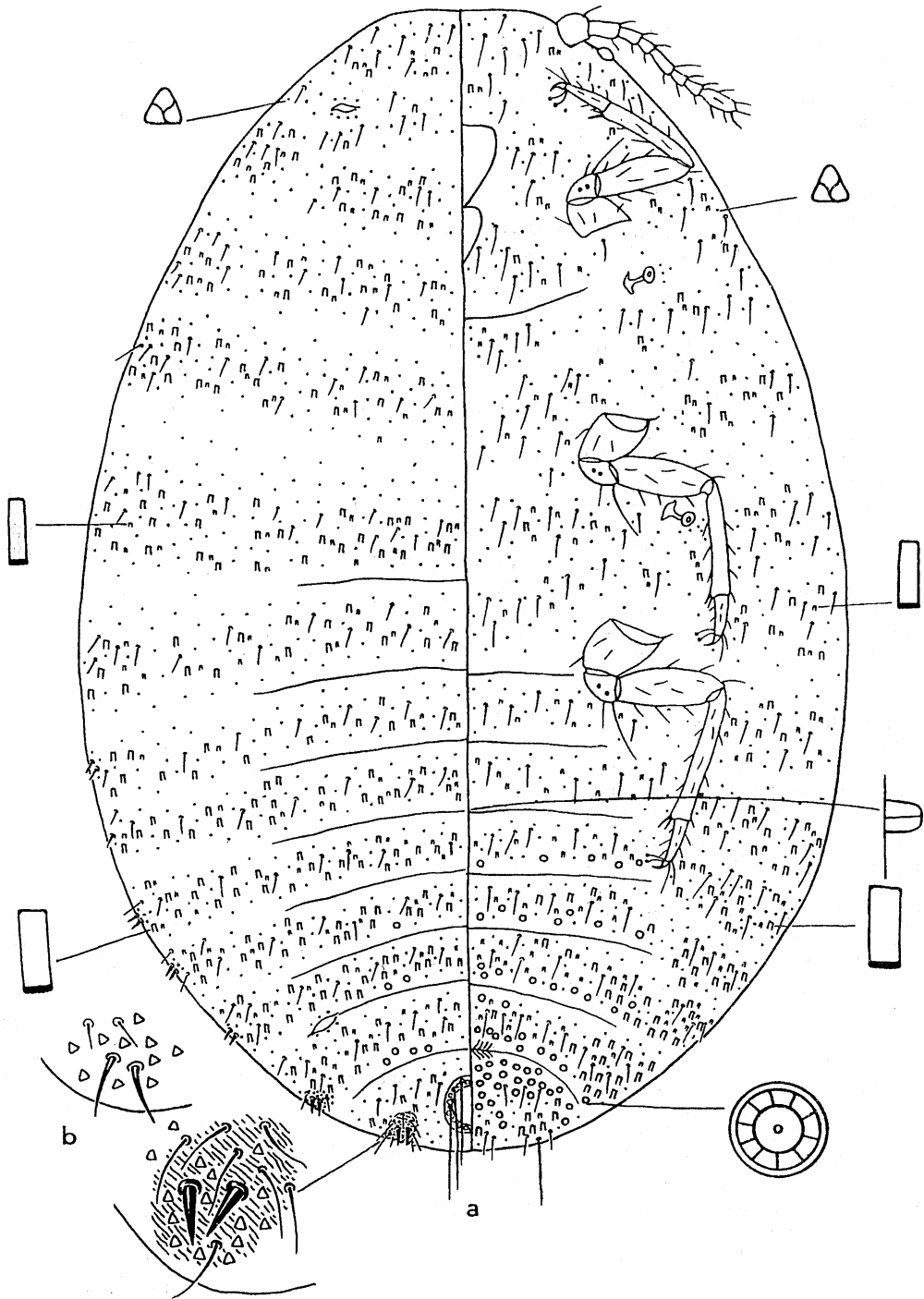


Fig. 7. *Trionymus multivorus* (Kir.), female: a, general view, specimen from Turkmenistan; b, C17, lectotype of *T. elymus* (Borchs.).

coccus); Borchsenius, 1949: 138 (*Pseudococcus*); Bodenheimer, 1953: 120 (*Pseudococcus*); Matesova, 1968a: 104; Ter-Grigorian, 1973: 63; Tereznikova, 1975: 263; Koteja & Žak-Ogaza, 1979: 672 (*Dysmicoccus*); Myartseva & Kharchenko, 1987: 63 (*Dysmicoccus*); Kosztarab & Kozár, 1988: 163. – *mendosus* Kiritschenko, 1936: 153 (*Pseudococcus*; Ukraine, Azerbaijan, Turkmenistan; l e c t o t y p e, designated here: ♀, "*Pseudococcus mendosus* Kir., Geok-Tapa, Elisab[et polskaya] guberniya [= Hanlar near Gyanzha, Azerbaijan], on the leaf sheaths of *Lactuca*, 22.VI.1912, Shelkovnikov", slide No. 227-39, specimen in black circle. Some material also present from Ukraine including Crimea, collected in 1938 and 1939 and determined by Kiritschenko as *P. mendosus*); Archangelskaya, 1937: 131 (*Pseudococcus*); Kiritschenko, 1940: 121 (*Pseudococcus*); Borchsenius, 1949: 138 (*Pseudococcus*; = *multivorus*). – *elymus* Borchsenius, 1937: 46 (Russia, Orenburg Prov.; l e c t o t y p e, designated here: ♀, "*Trionymus elymus* Borchs., on roots of *Artemisia austriaca*, Orenburg Prov., Ekaterinoslavka, Orsk [Distr.] [now Tyul'tinsky Distr.], 10.VII.1935, Bey-Bienko, 1933, t. 55", slide without No., specimen in black circle; paralectotype: ♀ on the same slide), *syn. n.*; 1949: 146 (*Pseudococcus elymi*); Matesova, 1968a: 103 ("*elymi*"); Tereznikova, 1975: 267 ("*elymi*"). – *saxatilis* Kir. (nom. nud.); Borchsenius, 1937: 182 (*Pseudococcus*). – *marrubium* Kir. (nom. nud.); Borchsenius, 1937: 184 (*Pseudococcus*). – *taraxaci* Kir. (nom. nud.); Borchsenius, 1937: 184.

Material. The types of *T. multivorus* and *T. elymus* and about 100 series from Russia and neighbouring countries.

Description. Female. Body oval, pinkish or pale purplish; 4.5 mm. Antennae 7-8-segmented. Hind coxae without pores. Circulus usually absent, sometimes present, large or medium-sized. Multilocular pores on dorsum on V-VII segments only or a few also on IV and VIII segments, on venter forming transverse rows and bands on III-VIII segments. Tubular ducts of two sizes, numerous on both surfaces, forming clusters of 1-4 large and 1 small ducts on the whole dorsum and venter of thorax. Cerarii numbering 2-10 (C₉-C₁₈), more often 4-6 pairs. C₁₈ with 2 stout conical setae, 7-12 auxiliary setae and numerous trilocular pores, on sclerotized plate. C₁₇ with 2 conical setae, smaller number of auxiliary setae and pores and small sclerotized plate. Anterior cerarii with smaller cerarian setae, with 1 or without auxiliary setae, with several pores and without sclerotized area. If only 2 pairs of cerarii present, C₁₇ with 2 widely separated filamentous setae and several pores.

Variation. The number of cerarii variable: generally insects with 3-7 and 2 pairs of cerarii are in different series, but in some series there are specimens that have 4 well devel-

oped pairs of cerarii and others that have only 2. Insects with poorly developed cerarii predominate in Kazakhstan, occur also in Orenburg Prov. (type series of *T. elymus*), Dagestan, and Ukraine. Circulus usually absent, but there are specimens with circulus. They occur in N. Caucasus, Azerbaijan, Turkmenistan and Uzbekistan. Insects with and without circulus are found usually separately, but in one series from the Caucasus there are specimens that have circulus and others that lack it. The size of circulus also vary.

Comments. The synonymy of *T. elymus* and *T. multivorus* has been established by comparison of types. The difference in the number of cerarii is within the range of intraspecific variation.

Distribution. Russia: Voronezh, Rostov and Orenburg provinces, Krasnodar and Stavropol territories, Dagestan; Georgia, Ukraine (including Crimea), Armenia, Azerbaijan, Kazakhstan (widely distributed), Uzbekistan, Kirghizia, Turkmenistan, Tadzhikistan. Switzerland, Italy, Hungary, Poland, Turkey, Iraq.

Host plants. Polyphagous, living on stems (often on the leaf sheaths) and bases of roots, roots and rarely on leaves of *Lactuca*, *Medicago*, *Helianthus*, *Daucus*, *Taraxacum*, *Malva*, *Dianthus*, *Marrubium*, *Altea*, *Artemisia*, *Cirsium*, *Centaurea*, *Scabiosa*, *Salvia*, *Perowskia* and many other wild herbaceous dicots. Recorded also from *Iris* and *Festuca*.

18. *Trionymus newsteadi* (Green, 1917)

Green, 1917: 265 (*Pseudococcus*; England); Kiritschenko, 1936: 131 (*Pseudococcus*); Borchsenius, 1949: 157 (*Pseudococcus*); Schmutterer, 1952: 388; Williams, 1962: 61; Afifi, 1968: 126 (♂); Ter-Grigorian, 1973: 72; Tereznikova, 1975: 270; Kosztarab & Kozár, 1988: 164.

Material. Caucasian and Teberda nature reserve, Krasnaya Polyana near Sochi, Armenia, Czech Republic.

Distribution. Russia (N. Caucasus); Ukraine, Armenia. England, Netherlands, Czech Republic, Germany, Hungary, Poland, Croatia.

Host plants. Living on the bark of beech: *Fagus sylvatica* and *F. orientalis*.

19. *Trionymus artemisiarum* (Borchsenius, 1949) (Fig. 8)

Borchsenius, 1949: 160 (*Pseudococcus*; Armenia; l e c t o t y p e, designated here: ♀, "*Pseudococcus artemisiarum* Borchs., Armenia, near Erevan, roots

of *Artemisia*, 20.V.1947, N. Borchsenius", slide No. 169-48; paralectotypes: 1 ♀ with identical label and 1 ♀ with the label "Armenia, Megri, 25 V 1947, N. Borchsenius", slide No. 175-48); Ter-Grigorian, 1973: 73; Matesova, 1968a: 103.

Material. Types, 3 additional females from Armenia and 3 from Kazakhstan.

Description. Female. Body oval and strongly convex, crimson; 3 mm. Antennae 7- or 6-segmented. Legs short, hind coxae with translucent pores. Circulus absent. Multilocular pores on venter only, occasionally a few present on dorsum. Tubular ducts numerous on both surfaces, mainly of one size, but on dorsum a few of larger type present. Cerarii on 2 last segments only. C₁₈ with 2 short conical setae, 1 long auxiliary seta (occasionally 1-2 short auxiliary setae also present) and several trilocular pores. C₁₇ with 2 conical setae (sometimes one conical seta replaced by flagellate one) and 2-3 pores. Body setae short.

Distribution. Russia: Dagestan; S. Armenia, S.E. Kazakhstan (Saur and Naryn Ranges).

Host plants. Living on roots of *Artemisia*.

20. *Trionymus levis* Borchsenius, 1937

Borchsenius, 1937: 46 [Russia: N. Caucasus, Krasnaya Polyana; l e c t o t y p e, designated here: ♀, "*Trionymus levis* Borchs., Sochi Distr., Aibga Mountain, 2000 m, on grass, herbarium No. 3039, 15.IX.1932", slide No. 2-36; paralectotypes: 1 ♀ with identical label as lectotype and 2 ♀ with the label: "Krasnaya Polyana (Sochi), 15.IX.1932, Borchsenius"]; 1939: 47; 1949: 161 (*Pseudococcus*). – *aberrans* Danzig, 1985: 112 (*Atrococcus*; Russia: N. Caucasus, Dombay), *syn. n.* – *aberranoides* Tang, 1992: 154, replacement name for *T. aberrans* Danzig, 1985 (non *T. aberrans* Goux, 1938).

Material. Types of *T. levis* and *T. aberrans* and 2 series from the Caucasian Nature Reserve.

Description. Female. Body oval, showing a black pigment in alcohol and potash; 3 mm. Antennae 8-segmented. Legs thin, hind coxae with translucent pores. Circulus absent. Multilocular pores on 5 last ventral segments only. Tubular ducts of larger type, on venter slightly narrower than on dorsum; scattered on both surfaces except the head and VIII tergite. Cerarii numbering 2 pairs only. C₁₈ with 2 slender conical setae, 1-2 auxiliary setae and group of trilocular pores. C₁₇ with 2 conical or 1 conical and 1 auxiliary setae (sometimes setae widely separated) and several pores.

Comments. The new synonymy has been established by comparison of types. *T. levis* differs from all other *Trionymus* species in the black pigment of body contents. Because of this peculiarity *T. aberrans* was described in the genus *Atrococcus* Goux, though it has no oral rim tubular ducts typical of this genus. We place this species in *Trionymus* with some doubt.

Distribution. Russia: N. Caucasus (Caucasian Nature Reserve, Aibga Mountain near Krasnaya Polyana, Dombay near Teberda).

Host plants. Living on the leaf sheaths of *Trifolium*, *Achillea*, *Scabiosa ochroleuca* and *Cephalaria brevifolia* at 2000 m altitude.

21. *Trionymus turgidus* (Borchsenius, 1949) (Fig. 9)

Borchsenius, 1949: 148 (*Pseudococcus*; Azerbaijan; l e c t o t y p e, designated here: ♀, "*Pseudococcus turgidus* Borchs., Azerbaijan, Geokchai Distr., on *Phragmites*, 17.V.1935", slide No. 473-39, specimen in black semicircle; paralectotypes: 4 ♀ with identical label). – *phragmitis* (non Hall, 1923): Borchsenius, 1939: 43 (*Ripersia*).

Material. The types.

Description. Female. Body oval; 4 mm. Antennae 7-6-segmented. Legs thin, hind coxae with translucent pores. Circulus small and oval. Multilocular pores on dorsum forming transverse rows on I-IV and bands on V-VIII segments, scattered on marginal areas of thorax and abdomen; on venter concentrated on last 5 segments, a few also present on thorax marginally. Tubular ducts of two sizes. Ducts of larger type on venter in marginal groups on V-VII segments, few present on dorsum also; ducts of smaller type (very small) sparse on both surfaces. Cerarii a single pair only (C₁₈), with 2 slender conical setae, 2-3 auxiliary setae and a group of trilocular pores.

Distribution. Known from the type series only.

Host plants. Living on leaves of *Phragmites australis*.

22. *Trionymus dilatatus* Danzig, 1971

Danzig, 1971: 368 (S. Primorsk Terr.: near Komisarovo W. of Lake Khanka); 1980a: 181.

Material. Type series.

Distribution. Known from the type series only.

Host plants. Living on roots of *Festuca pseudosulcata*.

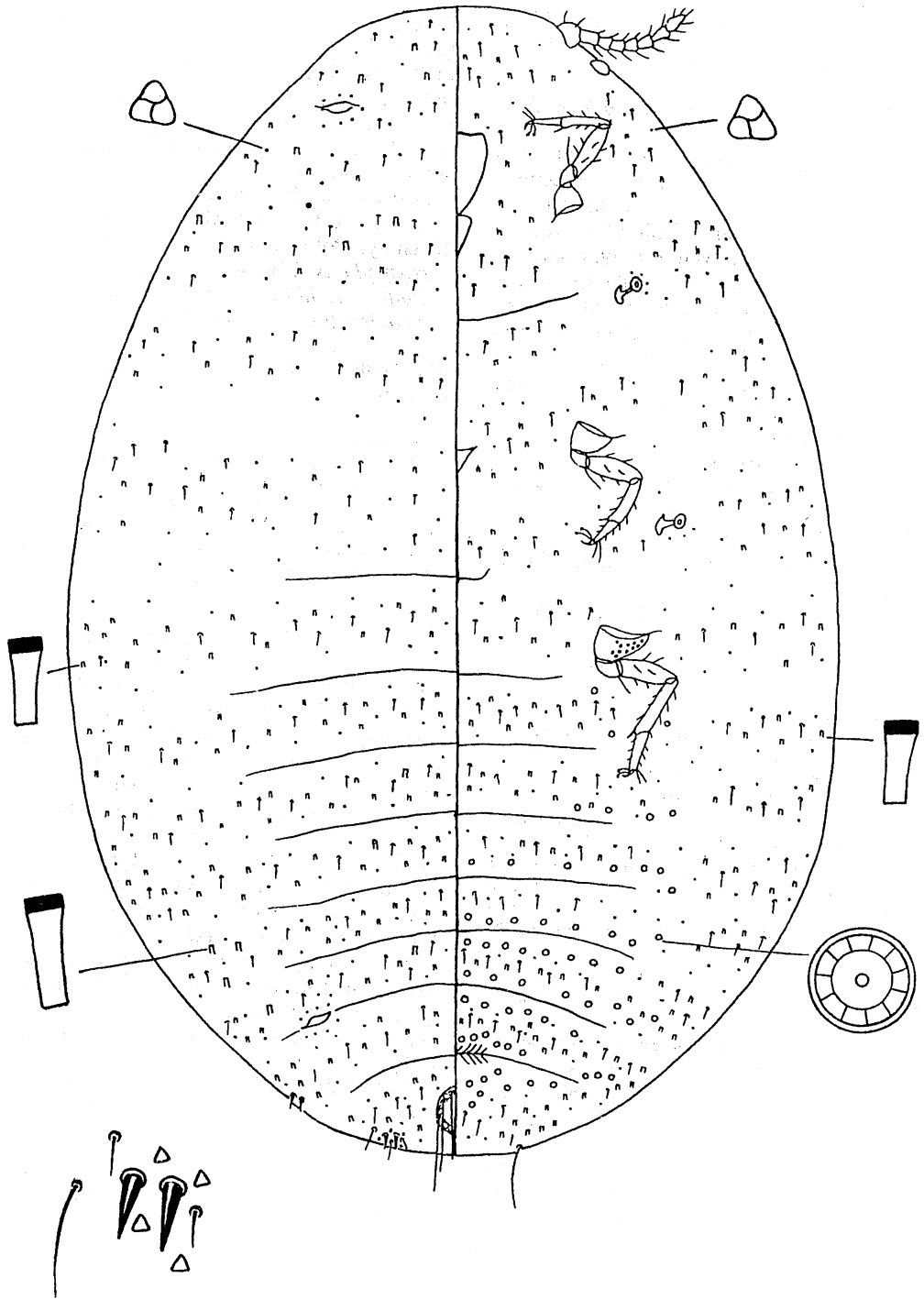


Fig. 8. *Trionymus artemisiarum* (Borchs.), female, paralectotype.

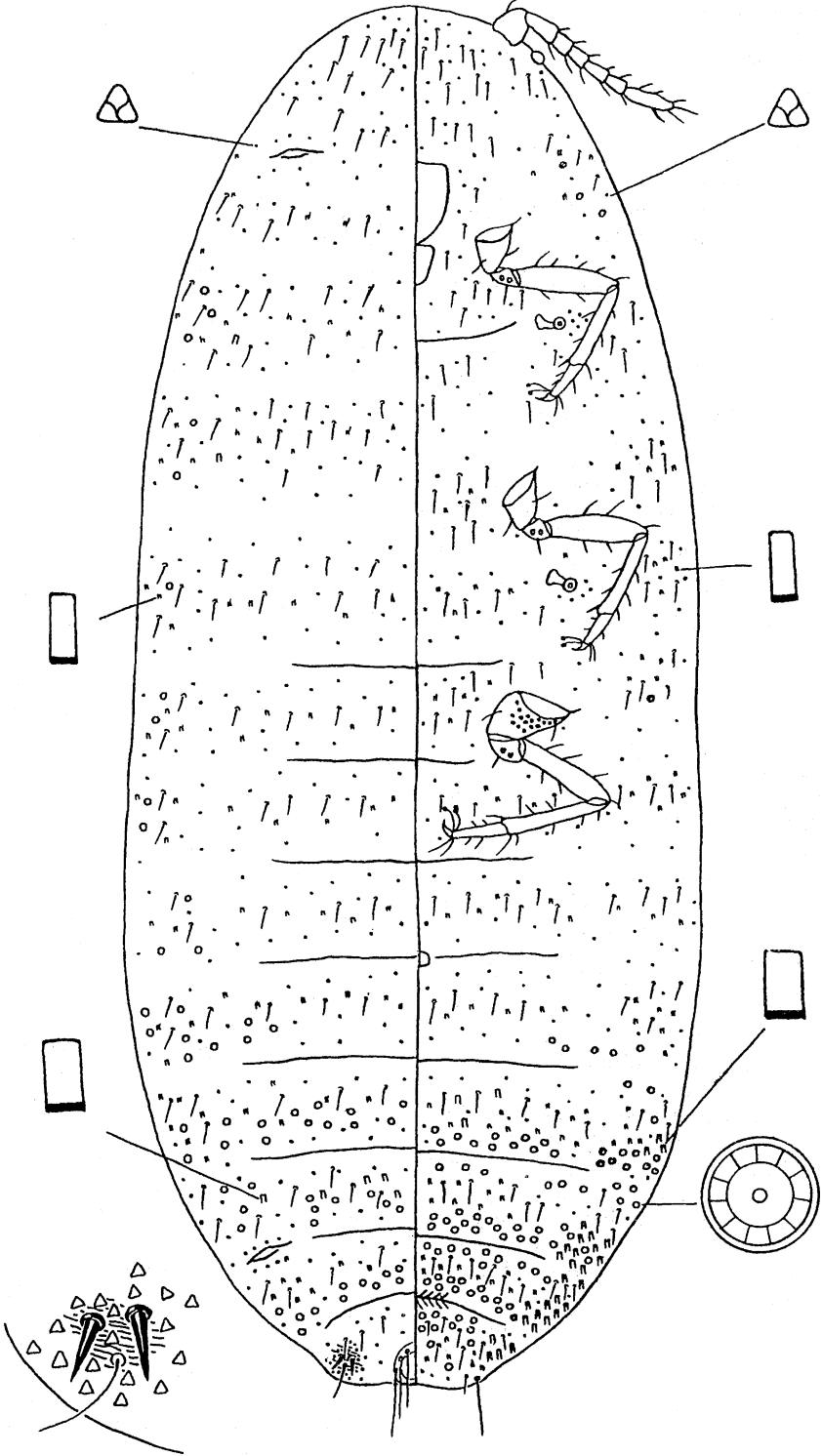


Fig. 9. *Trionymus turgidus* (Borchs.), female, paralectotype.

23. *Trionymus parvaster* Danzig, 1971

Danzig, 1971: 367 (southern Primorsk Terr.: near Ussuriysk); 1980a: 183.

Material. 2 series from Primorsk Terr.

Distribution. Southern Primorsk Terr.: near Ussuriysk, Khasan.

Host plants. Living on the sheaths of leaves and on roots of grasses.

24. *Trionymus subterraneus* (Newstead, 1893), comb. n.

Newstead, 1893: 79 (*Ripersia*; England); Williams, 1962: 17 (*Chnaurococcus*; = *formicarii*); Kosztarab & Kozár, 1988: 86 (*Chnaurococcus*). – *formicarii* Newstead, 1907: 5 (*Ripersia*; England). – *parvus* Borchsenius, 1949: 158 (*Pseudococcus*; Ukraine: Odessa, Georgia; lectotype, designated here: ♀, "*Ripersia parva* Borchs., on small roots of *Festuca* sp., Gori Distr., Akhal-Chiza Mountain, 19.VII. 1934, No 40, slide 111"; paralectotypes: 2 ♀ with identical label), *syn. n.*; Ter-Grigorian, 1966: 85 (*Chnaurococcus*); 1973: 77 (*Chnaurococcus*); Tereznikova, 1975: 173 (*Chnaurococcus*); Matesova, 1968a: 105. – *corynephorii* (non Signoret, 1875): Kiritshenko, 1940: 124 (*Ripersia*).

Material. Types of *T. parvus*, 3 series from Caucasus, 9 females from different localities in Armenia, 10 series from Kazakhstan, 3 females from Poland.

Variation. Most insects from Europe and the Caucasus have translucent pores on hind coxae poorly visible and tubular ducts in small number, but a few otherwise typical specimens have conspicuous translucent pores and more numerous ducts in medial abdominal area. In Kazakhstan such specimens are predominant (18 of 24).

Comments. The new synonymy has been established by comparison of types of *T. parvus* with the redescription of *T. subterraneus* (Williams, 1962).

Distribution. Russia: W. Caucasus (Arkhyz, Teberda), Dagestan; Ukraine, Georgia, Armenia, Kazakhstan (widely distributed). England, Spain, France, Denmark, Netherlands, Czech Republik, Poland, Sweden.

Host plants. Living on roots of many grasses, mainly on *Festuca*. Record (Matesova, 1968a) of this species from dicot herbs (*Centaurea*, *Potentilla* and *Filipendula*) is doubtful. Often occurring in ant nests.

25. *Trionymus aberrans* Goux, 1938

Goux, 1938: 166 (France: Marseille); Borchsenius, 1949: 149 (*Pseudococcus*); Matesova, 1968a: 103; Ter-Grigorian, 1973: 69; Tereznikova, 1975: 265;

Kosztarab & Kozár, 1988: 159; Tang, 1992: 153 (= *chifengensis* Tang). – *chifengensis* Tang, 1988: 22 (China: Inner Mongolia). – *pulverarius* (non Newstead, 1892): Kiritshenko, 1928: 3 (*Pseudococcus*).

Material. 20 series from Russia and former republics of the USSR.

Distribution. Russia: European part southwards to Voronezh Prov., N. Caucasus, Dagestan, Irkutsk Prov., Yakutia; Ukraine (including Crimea), Moldova, Armenia, Georgia, Kazakhstan, Uzbekistan, Turkmenistan (Kopetdag). France, Hungary, Bulgaria, Germany, Poland, China (Inner Mongolia), Korea.

Host plants. Living on the sheaths of leaves of *Hordeum*, *Agropyron*, *Lolium*, *Phragmites*, *Aristida* and other grasses. According to Tereznikova (1975), injurious to barley.

26. *Trionymus isfarensis* (Borchsenius, 1949)

Borchsenius, 1949: 152 (*Pseudococcus*; Tadzhikistan: Isfara Prov.); Danzig, 1983: 518 (designated lectotype; = *penium* Williams); 1987: 577. – *penium* Williams, 1962: 50 (*Saccharicoccus*; England); Koteja, 1969: 4; Danzig, 1978: 12; 1980a: 183; Koteja, 1986: 375 (*Saccharicoccus*); Kosztarab & Kozár, 1988: 151 (*Saccharicoccus*); Tang, 1992: 167. – *phragmitis* (non Hall, 1923): Kiritshenko, 1936: 132 (*Ripersia*); Borchsenius, 1949: 153 (*Pseudococcus*). – *polyporus* (non Hall, 1924): Kiritshenko, 1931: 312.

Material. Types of *T. isfarensis* and more than 20 series from Russia and neighbouring countries,

Variation. Usually in this species only one circulus is present. But in the Central Asian mountain populations the number of circuli varies from 1 to 3. The circulus between abdominal segments III and IV is always developed, large, of characteristic form, the other two are small. Of the 11 type specimens of *T. isfarensis*, 7 have one circulus and 4 have two; of the 52 specimens from Zailiysk Alatau, 27 have one circulus, 22 have two and 3 have three. Koteja (1969) described the variability of the form of circulus and noted that occasionally the circulus may be absent.

Distribution. Russia: Leningrad and Irkutsk provinces, N. Caucasus, southern Primorsk Terr., Sakhalin and Kunashir Islands; Ukraine: Odessa and Kherson provinces; Kazakhstan: Pavlodar Prov., Zailiysk Alatau; Tadzhikistan: Hissar Range. England, Poland, Bulgaria, China: Sichuan.

Host plants. Living on the sheaths of leaves of *Agropyron*, *Poa*, *Calamagrostis* and other grasses.

Acknowledgements

The work was supported by grant No. 26000 of the International Science Foundation and No. 26300 from the Russian Government. The author is thankful to Dr. D.J. Williams and Dr. J. Martin for the loan and gift of species described from England. I thank also my assistant M. Jagodintseva for preparation of slides and typing the manuscript. The work was fulfilled using scientific collections of the Zoological Institute, Russian Academy of Sciences, which obtain financial support from the Science and Technology State Committee of Russian Federation (Reg. No. 97-03-16).

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Received 5 May 1997