

**Scale insects of the Volga Area (Homoptera: Coccinea). IV.
Mirococcus vallis sp. nov. and some other mealybugs
(Pseudococcidae) from Samara Province of Russia**

**Кокциды (Homoptera: Coccinea) Поволжья. IV.
Mirococcus vallis sp. nov. и некоторые другие мучнистые
червецы (Pseudococcidae) из Самарской области**

I.A. GAVRILOV-ZIMIN* & A.S. KUROCHKIN

И.А. ГАВРИЛОВ-ЗИМИН, А.С. КУРОЧКИН

I.A. GavriloV-Zimin, Zoological Institute, Russian Academy of Sciences, 1 Universitetskaya Emb., St Petersburg 199034, Russia. E-mail: coccids@gmail.com

A.S. Kurochkin, Department of Zoology, Genetics and General Ecology, Samara State Aerospace University named after S.P. Korolev (National Research University), Akademika Pavlova str. 1, Samara 443011, Russia. E-mail: nitidula@mail.ru

Mirococcus vallis sp. nov. is described and illustrated from Samara Prov. of Russia. Three else species of mealybugs: *Fonscolombia amnicola* (Borchsenius, 1948), *Mirococcopsis subterranea* (Newstead, 1893) and *Ripersiella poltavae* (Laing, 1929) are reported for the first time to the fauna of the Volga Area.

В статье описан новый вид мучнистых червецов, *Mirococcus vallis* sp. nov., из Самарской области. Три других вида, *Fonscolombia amnicola* (Borchsenius, 1948), *Mirococcopsis subterranea* (Newstead, 1893) и *Ripersiella poltavae* (Laing, 1929), впервые отмечаются для фауны Поволжья.

Key words: scale insects, mealybugs, fauna of Russia, Volga region, Homoptera, Coccinea, Pseudococcidae, new records, new species

Ключевые слова: мучнистые червецы, кокциды, фауна России, Поволжье, Homoptera, Coccinea, Pseudococcidae, новые находки, новый вид

INTRODUCTION

The present paper continues a series of the reports dealt with the investigations of the Volga Area coccid fauna and systematics (GavriloV, 2004, 2006; GavriloV & Smirnova, 2006). According to these previous data, at least 56 species of scale insects inhabit the region. Recently the second author was able to collect four additional species from the family Pseudococcidae in steppe landscapes of Samara Prov. (middle part of the Volga Area). Three of these spe-

cies are listed below for the first time to the Volga Area and one species is described as a new for science.

MATERIAL AND METHODS

All material, including types, is deposited in the Zoological Institute, Russian Academy of Sciences, St Petersburg (ZIN RAS).

Type specimens of *Mirococcus vallis* sp. nov. were collected through visual survey of *Festuca valesiaca* plants, while the rest species were obtained in the laboratory as sifting of dozens clods with roots of *F. valesiaca*.

*Corresponding author

Methods of mealybug preparation in Canada balsam slides see in Danzig & Gavrilov-Zimin, 2014.

SYSTEMATIC PART

Mirococcus vallis sp. nov.

(Figs 1, 5)

Holotype: female, K 1288, Russia, *Samara Prov.*, Neftegorsk Distr., 3.4 km SSW Verkhnyaya Domashka Vill., 52°51'57.4''N 50°38'45''E, poor motley grass + *Festuca valesiaca* + *Stipa lessingiana* steppe (Figs 2, 3), under the leaf sheathes of *Festuca valesiaca* (Fig. 4), 21.VII.2010, A.S. Kurochkin.

Paratypes: 2 females with the same collecting data and one else female (K 1290) with the same data, but collected 12.VII.2010.

Description. Female. Body elongate oval, with almost parallel sides, up to 3 mm long, orange in life. Antennae 6-segmented. Legs small in comparison with body, with thin segments; hind coxae with translucent pores; claw with very small denticle. Anal apparatus simplified, with reduced number of pores and spinulae and with six shortened setae (see figure). Both pairs of ostioles present. Circulus small, oval or absent. Multilocular pores forming transverse rows on four posterior abdominal sternites and occasionally present on posterior abdominal tergites. Trilocular pores evenly scattered on all surface of body. Tubular ducts of two sizes: larger ducts present along margin of venter; smaller ducts forming transverse rows on abdominal sternites. Cerarii absent, but two thin flagellate setae accompanied by two or three trilocular pores present in place of C₁₈.

Males and morphology of larvae unknown.

Comments. The genus *Mirococcus* Borchsenius, 1947 was recently revised in the monograph on Palaearctic mealybugs (Danzig & Gavrilov-Zimin, 2014) with including thirteen species: *M. ankaranus* (Bodenheimer, 1953), *M. balagnus* (Balachowsky, 1933), *M. clarus* Borchsenius, 1949, *M. festucae* Koteja, 1971, *M. fossor* Danzig, 1983, *M. inermis* (Hall, 1925), *M. leymicolus* Tang,

1992, *M. longiventris* (Borchsenius, 1949), *M. oligodenatus* Danzig, 1982, *M. ostiaphurimus* (Kiritshenko, 1940), *M. scoparicolus* Tang, 1992, *M. sphaeroides* Danzig, 1975, and *M. ulykpani* Danzig, 1990. According to this revision, *M. vallis* sp. nov. seems to be most similar with Chinese endemic *M. leymicolus* Tang, 1992 and with *M. longiventris* Borchsenius, 1949, known from Armenia and Uzbekistan. However, both of these species possess tubular ducts of only one (narrow) type, whereas *M. vallis* sp. nov. has two types of ducts (narrow and wide). The other differences see in a renovated key to all species of the genus *Mirococcus* below.

Etymology. The species name is constructed from the Latin word "valles" which means "valley" in English.

A renovated key to the species of the genus *Mirococcus*

(adopted from the key of Danzig & Gavrilov-Zimin, 2014)

- 1(26) Fore legs of usual structure, not burrowing type; claw with one denticle or without denticle (in *M. ulykpani*).
- 2(25) Anal apparatus with 6 setae.
- 3(16) Multilocular pores numerous and present on both body sides.
- 4(15) Tubular ducts present. Multilocular pores with one central loculus.
- 5(14) Circulus one or absent at all. On herbaceous plants and grasses.
- 6(7) One (posterior) pair of ostioles present
..... *M. ankaranus*
- 7(6) Both pairs of ostioles present.
- 8(11) Tubular ducts scattered everywhere on both body sides.
- 9(10) One circulus present. Dorsal multilocular pores numerous on all segments
..... *M. inermis*
- 10(9) Circuli absent. Dorsal multilocular pores present on abdominal segments only. Endemic of Northern China . . . *M. scoparicolus*
- 11(8) Tubular ducts present on ventral surface of body only.
- 12(13) Tubular ducts of two sizes. Anal apparatus simplified *M. vallis* sp. nov.
- 13(12) Tubular ducts of one size only. Anal apparatus complete. Endemic of Northern China
..... *M. leymicolus*

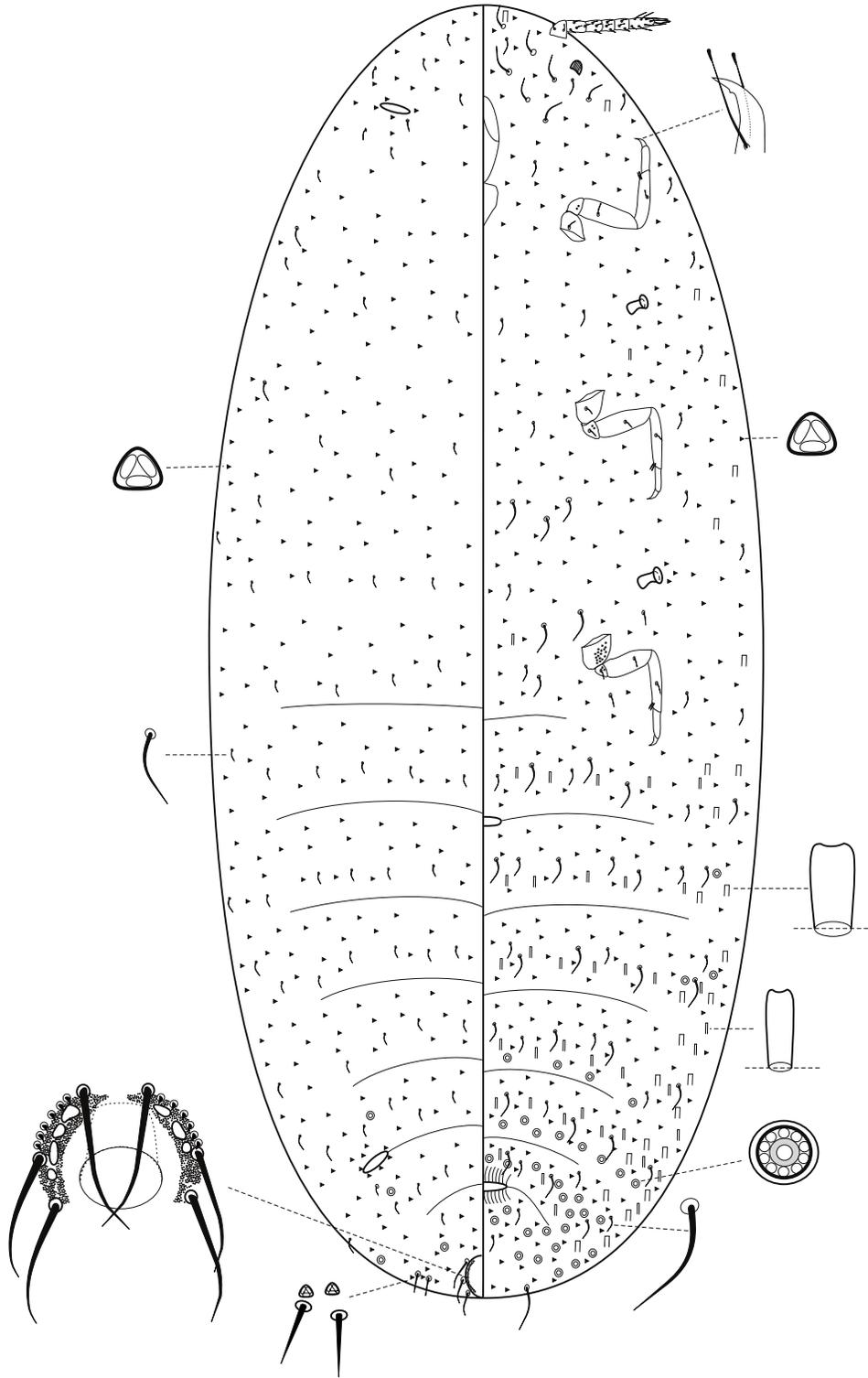
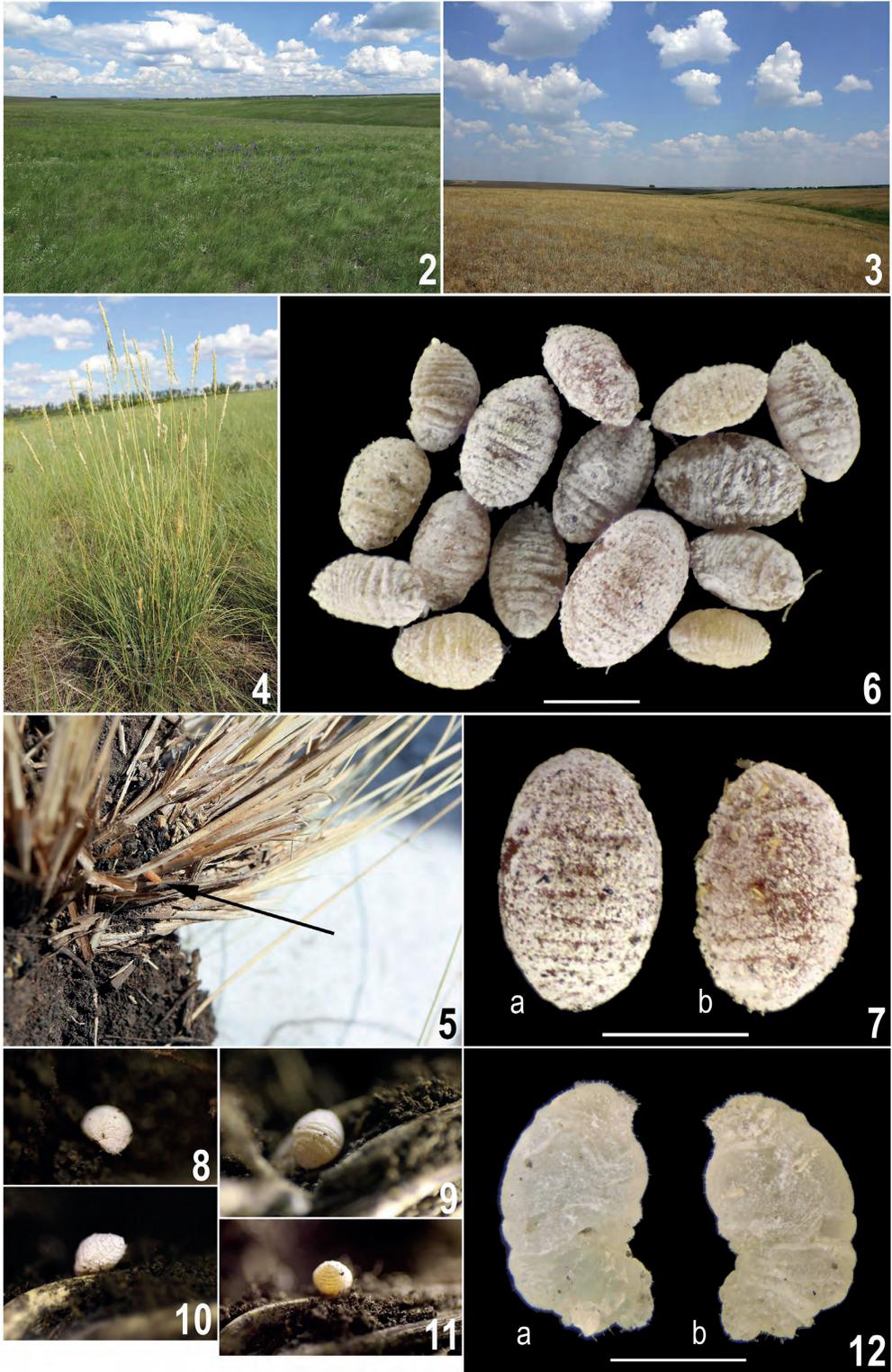


Fig. 1. *Mirococcus vallis* sp. nov., total view of prepared female (holotype).



- 14(5) Circuli five in number. On stems and branches of trees *M. ostiaphurimus*
- 15(4) Tubular ducts absent. Multilocular pores with 2–4 central loculi *M. sphaeroides*
- 16(3) Multilocular pores few, distributed on ventral surface of body or absent at all.
- 17(24) Multilocular pores present.
- 18(21) Tubular ducts of two sizes; larger ones present on dorsal surface of body and can be found along margin of ventral surface.
- 19(20) Tubular ducts with small narrow collar. Anal apparatus simplified, with reduced number of pores and spinulae. Hind coxae, femurs and tibiae with translucent pores *M. clarus*
- 20(19) Tubular ducts of two types: simple and fungiform. Anal apparatus complete. Hind legs without translucent pores *M. balagnus*
- 21(18) Tubular ducts of one size, present on venter only.
- 22(23) Hind coxae with translucent pores. Antennae 8-segmented *M. longiventris*
- 23(22) Hind coxae without translucent pores. Antennae 7-segmented *M. festucae*
- 24(17) Multilocular pores absent *M. oligodenatus*
- 25(2) Anal apparatus includes 6–10 supplementary smaller setae in additional to 6 usual setae *M. ulykpani*
- 26(1) Fore legs of burrowing type; claw of fore leg with two denticles *M. fossor*

Fonscolombia amnicola

(Borchsenius, 1948)

(Figs 6, 7)

Material. K 1286-b, **Russia**, *Samara Prov.*, Neftegorsk Distr., 3.4 km SSW of Verkhnyaya Domashka Village, 52°51'57.4"N 50°38'45"E, poor motley grass + *Festuca valesiaca* + *Stipa lessingiana* steppe, on roots of *Festuca valesiaca*, 12.VII.2010, A.S. Kurochkin; K 1287, the same

data, but collected 05.VII.2015; K 1289, the same data, but collected 03.VII.2015.

Comments. The species was earlier known from Russian North Caucasus, Georgia, Armenia, Turkey and Kazakhstan. It is the first record of the species in the Volga Area.

In the available figures of this species (Tereznikova, 1975; Danzig & Gavrilov-Zimin, 2014) large simple discoidal pores were erroneously omitted. These pores similar in size with trilocular pores and numerous on both body sides as we were able to see in the fresh material from Samara Prov. as well as in the lectotype, restudied by us in the collection of ZIN RAS.

Mirococcopsis subterranea

(Newstead, 1893)

(Figs 6, 8–11; video files, see Addenda)

Material. K 1286-a, **Russia**, *Samara Prov.*, Neftegorsk Distr., 3.4 km SSW of Verkhnyaya Domashka Village, 52°51'57.4"N 50°38'45"E, poor motley grass + *Festuca valesiaca* + *Stipa lessingiana* steppe, on roots of *Festuca valesiaca*, 12.VII.2010, A.S. Kurochkin.

Comments. The species is widely distributed through all southern Palaearctic, but is noted here for the first time in the Volga Area. Available females contain fully developed larvae inside of their bodies, i.e. obligate ovoviviparous.

Ripersiella poltavae (Laing, 1929)

(Fig. 12)

Material. K 1292, **Russia**, *Samara Prov.*, Neftegorsk Distr., 3.4 km SSW of Verkhnyaya Domashka Village, 52°51'57.4"N 50°38'45"E, poor motley grass + *Festuca valesiaca* + *Stipa*

Figs 2–12. Scale insects and their habits: **2, 3.** Poor motley grass + *Festuca valesiaca* + *Stipa lessingiana* steppe of type locality (**2**, 06.VI.2015; **3**, 10.VII.2010); **4.** *Festuca valesiaca* host plant; **5.** *Mirococcus vallis* sp. nov., female partly concealed under leaf sheath of *F. valesiaca* in life; **6.** *Fonscolombia amnicola* (pinkish specimens) and *Mirococcopsis subterranea* (yellowish specimens), alive females under laboratory conditions; **7.** *F. amnicola*, alive female under laboratory conditions, dorsal (a) and subventral (b) view; **8–11.** *M. subterranea*, alive female on soil (**8**) and root of *F. valesiaca* (**9–11**) under laboratory conditions, anterior (**8**), dorsal (**9**), lateral (**10**) and posterior (**11**) views; **12.** *Ripersiella poltavae*, alive female under laboratory conditions, dorsal (a) and ventral (b) views. Scale bars: 0.5 mm for 12; 1 mm for 6, 7.

lessingiana steppe, on roots of *Festuca valesiaca*, 31.V.2015, A.S. Kurochkin.

Comments. The species was earlier recorded from Italy, Ukraine, Southern Russia (Krasnodar Terr.), Armenia, Kazakhstan and Kirgizia. It is the first record of the species in the Volga region.

Notes on bionomy and distribution

All four mealybug species, *M. vallis* sp. nov., *F. amnicola*, *M. subterranea* and *R. poltavae*, were collected in the steppe and exclusively on *Festuca valesiaca*. This host plant is one of the dominant or subdominant grass species in the steppe communities in Samara Prov. and is common in this area. Obviously all considering mealybug species are also widely distributed within Samara Prov. *F. amnicola*, *M. subterranea* and *R. poltavae* inhabit roots and are characterized by a hypogeal mode of life. In contrast to them, *M. vallis* sp. nov. lives under the leaf sheathes of the host plant and probably never penetrates below the soil level.

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ADDENDA

Electronic supplementary material. Video files 1, 2. File format: MOV. Available from: <http://www.zin.ru/journals/zsr/content.asp?year=2016>

Explanation note. *Mirococcopsis subterranea* in soil on roots of *Festuca valesiaca*.

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