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A new pest from a greenhouse of St. Petersburg (Russia) — *Rhizoecus mexicanus* (Hambleton) (Homoptera: Pseudococcidae) with karyotype data

Новый вредитель из теплицы Санкт-Петербурга (Россия) — *Rhizoecus mexicanus* (Hambleton) (Homoptera: Pseudococcidae) и данные о его кариотипе

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КЛЮЧЕВЫЕ СЛОВА: Coccinea, Pseudococcidae, *Rhizoecus mexicanus,* новый вредитель, теплица, кариотип.

ABSTRACT: *Rh. mexicanus* (Hambleton, 1946) is reported for the first time for Russia based on material collected in a greenhouse of St. Petersburg on the roots of *Opuntia* sp. The species is similar to *Rh. solani* (Hambleton, 1946) that probably was erroneously noted to Europe earlier. The differences between *Rh. mexicanus* and *Rh. solani* are discussed and illustrated. The karyotype of *Rh. mexicanus* is reported as 2n=8.

РЕЗЮМЕ. На основании материала, собранного в теплице г. Санкт-Петербурга на корнях опунции, впервые для России указывается мучнистый червец *Rh. mexicanus* (Hambleton, 1946). Рассматриваемый вид близок к *Rh. solani* (Hambleton, 1946), который ранее, вероятно ошибочно, указывался для Европы. Обсуждаются и иллюстрируются различия между этими двумя видами. Для *Rh. mexicanus* приводятся данные о кариотипе; 2n=8.

Introduction

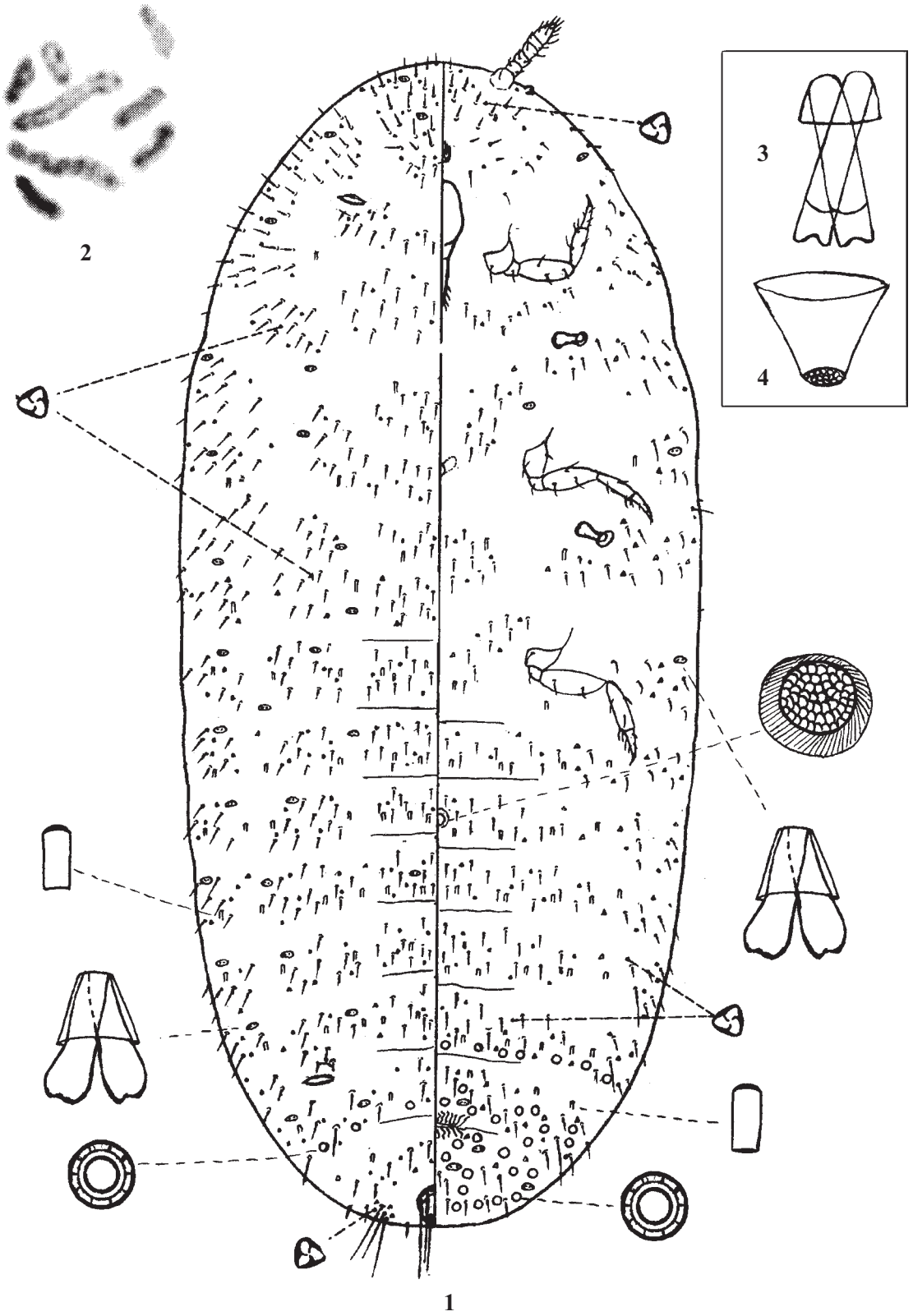
In September 2003 a new pest of Cactaceae was found in a greenhouse of St. Petersburg. The material was collected by Dr. Nikolai Yunakov on *Opuntia* sp. The mealybugs inhabit the roots and bases of stems significantly injuring the host plants. The plant material was received from the Netherlands. Dr. Maurice Jansen (Ministry of Agriculture, Nature and Food Quality, Netherlands) kindly sent material collected from *Opuntia* sp. in greenhouses of the Netherlands and determined as *Rhizoecus solani* (Hambleton, 1946). According to Jansen [2004, in press] the species was first collected in greenhouses in Europe in 1976. I have studied my material and material from the Netherlands and determined that they are all the same species. On the other hand, a comparison of this material with paratypes of *Rh. solani* and *Rh. mexicanus* (Hambleton, 1946) (kindly send by Dr. Dr. Douglass Miller, USDA-ARS Systematic Entomology Laboratory, Beltsville, U.S.A.) has shown that the material is not *Rh. solani* but is more similar to *Rh. mexicanus*. This species is reported from Europe for the first time. Previously it was known in Nearctic (Mexico and USA) only [Hambleton, 1976; Williams & Granara de Willink, 1992]. A short description of *Rh. mexicanus* and comparison with *Rh. solani* is provided here.

Rhizoecus mexicanus (Hambleton, 1946) (Fig. 1)

MATERIAL. Paratype of *Rh. mexicanus* (Hambleton) — Seffner, Fla., 5.VII.1978, C.W. Hale, on *Mammillaria leucocentra*; 4 ♀♀ of *Rh. mexicanus* — Russia, St. Petersburg, under glass, on roots of *Opuntia* sp., N. Yunakov, 29.X.2003; 4 ♀♀ of *Rh. mexicanus* — Netherlands, under glass, on *Opuntia* sp.

Paratype of *Ripersiella solani* Hambleton — Guatemala City, Guat, E. J. Hambleton, coll. May 12, 1945; 24. VII. 2003. *Rh. solani* (Hambleton) — Texas, Langtry, Valverde, 13.V.1976, R.D. Gordon, D.R. Miller, on *Cylindroopuntia.*

REDESCRIPTION. Adult female in life, white and covered by white powdery wax secretion. Body elongate-oval, sides subparallel, 1.5–2 mm long. Posterior end of body rounded or with poorly developed anal lobes each with 3 apical dorsal setae; ventral apical setae absent. Antennae with 6 segments; antennal bases placed fairly close together. Legs comparatively small; claw with a pair of digitules about same length as claw. Eyes very small, round. Circulus present on abdominal segment III. The size of the circulus at its widest diameter variable, about 40 mkm in paratype from North America, from 25 to 35 mkm in females from St. Petersburg, from 18 to 25 mkm in females from the Netherlands. Ostioles present, indistinct. Cephalic plate weakly sclerotized and indistinct. Bitubular pores projecting slightly, about 7–8 mkm long, ducts diverging; pores numbering 60–68, present



Figs. 1–4. *Rhizoecus* spp. 1–2 — *Rh. mexicanus* (Hambleton): 1 — adult female; 2 — karyotype; 3–4 — *Rh. solani* (Hambleton): 3 — bitubular pore; 4 — circulus.

Рис. 1–4. *Rhizoecus* spp.: 1–2 — *Rh. mexicanus* (Hambleton): 1 — взрослая самка; 2 — кариотип; 3–4 — *Rh. solani* (Hambleton): 3 — двухтрубчатая пора; 4 — брюшное устьице.

mainly on dorsum but a few present on ventrum.

Dorsal surface with slender flagellate setae, fairly numerous in bands across the segments but absent from wide intersegmental areas. Multilocular disc pores (2–4 in number) present only on abdominal segment VII. Trilocular pores evently distributed among the setae. Tubular ducts and bitubular pores numerous and forming rows on dorsal segments.

Ventral surface with setae similar to those on dorsum. Multilocular disc pores numerous on abdominal segments VI–VIII. Trilocular pores distributed among setae. Separate bitubular pores present medially on last 2 abdominal segments and thorax and also on the body margin. Tubular ducts forming rows on abdominal segments and present separately on thorax.

TAXONOMICAL COMMENTS. There are three very similar North American species of *Rhizoecus* possessing bitubular pores: *Rh. mexicanus, Rh. solani,* and *Rh. gracilis* McKenzie, 1961. *Rh. solani* has bitubular pores of distinctive structure; they are big (about 13 mkm long) and their ducts subparallel (Fig. 3). The circulus of *Rh. solani* is represented by a deep crater with a narrow opening (as on Fig. 4). *Rh. gracilis* differs by having a small number of tubular ducts that are very small and short [according to McKenzie, 1967], small number of multilocular pores, and the presence of sclerotized areas on the anal lobes.

A difference in host plants is probably present. *Rh. mexicanus* was described from succulents, *Rh. solani* — from *Solanum*, *Rh. gracilis* was mainly collected on different Aceraceae. For each of these three species some uncommon host plants are also noted: succulents for *Rh. solani* and *Rh. gracilis,* and undetermined grass for *Rh. mexicanus.* However, these findings may not be significant. It is common knowledge that mealybugs often move away from their host plants during oviposition. For example, I found females of *Trionymus perrisii* (Signoret), connected with grasses, on roots of *Potentilla* and *Artemisia* [Gavrilov, 2003]. So, the abovementioned slide determined as "*Rh. solani*" from *Cylindroopuntia* from Texas, to my mind, is more similar to *Rh. mexicanus* than to type of *Rh. solani.*

Of special interest is the variability of circulus size in *Rh. mexicanus.* Females from Europe (see above) have the circulus about 18–35 mkm and type material is about 40 mkm. Probably, these differences are caused by individual variability and the intensity of fuchsin-coloration.

KARYOTYPE**.** Males have not been found. Adult females and ovisacs were fixed in acetoethanol (1:3). The study of gravid females has shown that the development of eggs begins after oviposition. Eggs from ovisacs were used to study the karyotype. The material was stained by squashing in a drop of lacto-acetoorsein.

The karyotype of this species (Fig. 2) is asymmetrical in structure and includes one pair of noticeably longer than others; chromosomes are holokinetic (without centromeres). 2n = 8 unlike three other karyotyped species of *Rhizoecus* — *Rh. falcifer* Knuckel d'Herculais and *R. dianthi* Green with 2n = 12 and *R. mayanus* (Hambleton) with 2n = 10 [Nur et al., 1987].

To my knowledge, the karyotypes of *Rh. solani* and *Rh. gracilis* are unknown. So, I am unable to compare them with the karyotype of *Rh. mexicanus*.

Two examples from 10 analyzed eggs had cells, in which one haploid chromosome set was euchromatic whereas the other — heterochromatic. It is characteristic of the "Lecanoid" chromosome system that is usual for mealybugs [Nur, 1980].

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