

A new species of the genus *Chorizococcus* (Hem.: Coccoidea: Pseudococcidae) from Iran

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Abstract

A new mealybug species, *Chorizococcus pazoukii* Moghaddam **sp. n.** is described on the root of an unknown plant from Iran. The new species is taxonomically near to the Iranian species *Chorizococcus viticola* Kaydan & Kozár but it is distinguished by the oral rim tubular ducts occur in two rows across of dorsum, two sizes of oral rim tubular ducts on both surfaces of the body and the presence of multilocular disc pores on the ventral abdominal segments VI-VIII + IX.

Key words: *Chorizococcus pazoukii*, Coccoidea, Pseudococcidae, Iran

چکیده

یک گونه جدید از جنس (*Chorizococcus* (Hem.: Coccoidea: Pseudococcidae) از ایران

معصومه مقدم و محمود علی‌خانی

گونه جدید *Chorizococcus pazoukii* Moghaddam **sp. n.** جمع‌آوری شده از روی ریشه یک گیاه ناشناخته، از ایران توصیف می‌گردد. این گونه شباهت به گونه دیگری از همین جنس از ایران به نام *Chorizococcus viticola* Kaydan & Kozár دارد، اما به واسطه داشتن مجاری لوله‌ای در دو ردیف در ناحیه پشتی بدن، مجاری لوله‌ای در دو اندازه واقع در هر دو سطح بدن و همچنین وجود روزنه‌های دیسکی چندحفره‌ای روی مفصل‌های شکمی VI-VIII + IX از گونه *C. viticola* متفاوت است.

واژگان کلیدی: *Chorizococcus pazoukii*, Coccoidea, Pseudococcidae, ایران

Introduction

The mealybug genus *Chorizococcus* McKenzie includes 56 described species worldwide, of which half are from the Nearctic region and the remaining species from other five regions (Ben-Dov *et al.*, 2014). Although the genus has a worldwide distribution, many of the species are restricted to a limited area. Those species of *Chorizococcus* that are distributed to the Palearctic region are as follows: *C. parietaricola* (Bodenheimer) (recorded from Iraq (Bodenheimer, 1943)), *C. scorzonerae* Tang (recorded from China (Tang, 1992)), *C. viticola* Kaydan & Kozár (recorded from Iran (Fallahzadeh *et al.*, 2010)) and *C. rostellum* (Lobdell) (distributed in Palearctic, as well as three more biogeographical regions (Ben-Dov *et al.*, 2014)). *Chorizococcus* species have been reported on 117 host plant species belonging to 25 families, especially Poaceae and Asteraceae (Tang, 1992; Ben-Dov, 1994; Fallahzadeh *et al.*, 2010; Moghaddam, 2013; Ben-Dov *et al.*, 2014).

The genus *Chorizococcus* is taxonomically related to the genus *Vryburgia* De Lotto in possessing dorsal oral collar tubular ducts on the margins only, whereas in *Vryburgia* they occur in transverse rows

(Williams, 2004). The genus *Spilococcus* Ferris is also almost taxonomically near to *Chorizococcus* but possesses 6-17 pairs of cerarii, being at least 6 pairs on the abdomen. Miller & McKenzie (1973) discussed the difficulties of assigning species to either *Chorizococcus* or *Spilococcus*. Danzig (1998) did not accept *Chorizococcus* and included all species with 1-17 pairs of cerarii in *Spilococcus sensu lato*. Many species currently placed in *Chorizococcus* are found on Poaceae (Williams, 2004), but the Iranian species *C. viticola* collected from *Vitis vinifera* (Fallahzadeh *et al.*, 2010).

In this paper, the adult female of a new *Chorizococcus* species is described and illustrated. In addition, an identification key to the Palearctic species of *Chorizococcus* is presented.

Materials and methods

The specimens were slide-mounted according to the method of Williams & Granara de Willink (1992). The figure shows a central enlargement of the entire body, with the dorsum on the left and the venter on the right. The figure has one or more vignettes around the central figure showing the detailed structure of

particular characters (not drawn to the same scale). The morphological terminology follows that of Williams (2004). The external morphology of holotype was illustrated using the drawing tube of Carl Zeiss Microscope (Phase contrast). Both dry and mounted materials are presently deposited at the Hayk Mirzayans Insect Museum (HMIM), Iranian Research Institute of Plant Protection (IRIPP), Tehran, Iran.

Results

Chorizococcus pazoukii Moghaddam sp. n.

(Fig. 1)

Description – Appearance in life not noted. Body of mounted female elongate oval to broadly oval, largest specimen 3.2 mm long and 1.8 mm wide. Anal lobes barely visible, each ventral surface bearing an apical seta about 140 μ m long. Antennae each about 470 μ m long, with 8 segments. Legs well developed, small for size of body, hind trochanter + femur 260-280 μ m long, hind tibia + tarsus 310-320 μ m long, claw about 30 μ m long. Ratio of lengths of hind tibia + tarsus to hind trochanter + femur about 1:1.14. Ratio of lengths of hind tibia to tarsus about 1:3.12. Translucent pores large, present on posterior surface of hind tibia. Circulus about 220 μ m wide, and divided by intersegmental line. Ostioles well developed, inner edges of lips weakly sclerotized, each lip with a few trilocular pores, posterior ostioles without any setae, anterior ostioles with some small setae. Anal ring about 80 μ m wide, with 2 rows of pores, bearing 6 setae, each about 75 μ m long. Cerarii numbering a single pair situated on anal lobes, each cerarius with 2 large conical setae, each about 70 μ m long, 3 or 4 auxiliary setae and a group of trilocular pores, all situated on a slightly sclerotized area.

Dorsal surface with short and stiff setae, mostly each 12.5 μ m. Multilocular disc pores absent. Trilocular pores present, evenly distributed. Discoidal pores minute, sparsely present. Oral rim tubular ducts of 2 sizes: a large type, each with a rim about 8.7 μ m in diameter, numerous distributed in wide bands over entire dorsum, except abdominal segment VIII. A

small type, each with a rim narrower than a multilocular disc pore, located across the posterior abdominal segments. Oral collar tubular ducts few in number, present on margins of abdominal segments IV-VIII.

Ventral surface with normal flagellate setae. Multilocular disc pores, each about 7.5 μ m in diameter, present medially in more or less double rows at posterior edges of abdominal segments VI and VII, and posterior to vulva. Trilocular pores present, evenly dispersed. Discoidal pores scattered. Oral rim tubular ducts of 2 sizes: a large type, similar to those on dorsum, distributed over entire venter, except posterior to vulva. A small type, dispersed in marginal and submarginal zones. Oral collar tubular ducts same as those on dorsum, present mainly around lateral margins of posterior abdominal segments and at the posterior edges of abdominal segments III-VIII.

Material examined – Holotype. Adult ♀, Iran: Markazi province, Shazand, Mohajeran, N 34° 02' 29.16", E 49° 24' 40.14", 2000 m., 17.v.2012, ex: on the root of an unknown plant, (A. Alikhani), (IRIPP). Paratypes. Iran: same data as holotype, 5 adult ♀♀, (IRIPP).

Etymology – The species is named after Ali Pazouki (Lepidopterist) who has helped the first author in many ways in her present and past work.

Comments – *Chorizococcus pazoukii* sp. n. comes close to *C. viticola* from Iran in the general distribution of oral rim tubular ducts, presence of a circulus, and translucent pores on hind tibiae. However, *C. pazoukii* differs from the latter species by (1) the oral rim tubular ducts being in wide bands across the head, thorax and dorsal abdominal segments (one row); (2) two sizes of oral rim tubular ducts on both surfaces (equal size); and (3) presence of multilocular disc pores on ventral abdominal segments VI-VIII + IX (V-VIII + IX).

Key to *Chorizococcus* species in the Palaearctic region

1. Oral rim tubular ducts on dorsum in a single row ... 2
- Oral rim tubular ducts on dorsum in 2 rows 3

References

- Ben-Dov, Y.** (1994) *A systematic catalogue of the mealybugs of the world (Insecta: Homoptera: Coccoidea: Pseudococcidae and Putoidae) with data on geographical distribution, host plants, biology and economic importance*. 686 pp. Intercept Limited, Andover, UK,
- Ben-Dov, Y., Miller, D. R. & Gibson, G. A. P.** (2014) ScaleNet. Available from: <http://www.sel.barc.usda/scalenet/scalenet.htm> (accessed March 2014).
- Bodenheimer, F. S.** (1943) A first survey of the Coccoidea of Iraq. *Government of Iraq, Ministry of Economics, Directorate General of Agriculture, Bulletin* 28, 1-33.
- Danzig, E. M.** (1998) Revision of mealybugs (Homoptera, Pseudococcidae) with oral rim tubular ducts of the fauna of Russia and neighbouring countries. *Entomologicheskoe Obozrenye* 77(1), 106-133.
- Fallahzadeh, M., Kaydan, M. B. & Kozár, F.** (2010) Description of a new species of *Chorizococcus* (Hemiptera: Coccoidea: Pseudococcidae) infesting *Vitis vinifera* in Iran. *Türkiye Entomoloji Dergisi* 34(2), 157-163.
- Miller, D. R. & McKenzie, H. L.** (1973) Seventh taxonomic study of North American mealybugs (Homoptera: Coccoidea: Pseudococcidae). *Hilgardia* 41, 489-542.
- Moghaddam, M.** (2013) A review of the mealybugs (Hemiptera: Coccoidea: Pseudococcidae, Putoidae and Rhizoecidae) of Iran, with descriptions of four new species and three new records for the Iranian fauna. *Zootaxa* 3632(1), 001-107.
- Tang, F. T.** (1992) *The Pseudococcidae of China*. 768 pp. Shanxi Agricultural University, Taigu, Shanxi, China.
- Williams, D. J.** (2004) *Mealybugs of Southern Asia*. 896 pp. The Natural History Museum London, Kuala Lumpur: Southdene SDN. BHD.
- Williams, D. J. & Granara de Willink, M. C.** (1992) *Mealybugs of Central and South America*. 635 pp. CAB International, London, England.

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