

**Orijinal araştırma (Original article)**

**A new species of *Stipacoccus* Tang, 1992 and  
redescription of *Pararhodania armena*  
Ter-Grigorian, 1964 (Hemiptera:  
Coccoidea: Pseudococcidae) <sup>1</sup>**

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**Summary**

A new mealybug species, *Stipacoccus torosae* Kaydan & Kozár sp. nov. (Hemiptera: Pseudococcidae), is described and illustrated based on the adult female, which was collected from *Cynodon dactylon* L. (Poaceae) at Ankara in Turkey. Following examination of the type material of *Pararhodania armena* Ter-Grigorian, 1964 and recently collected specimens from Van, Turkey, the adult female of this species is redescribed and re-illustrated. Both species are new records for the Turkish scale insect fauna (Hemiptera: Coccoidea).

**Keywords:** Pseudococcidae, reduced anal ring, *Stipacoccus*, *Pararhodania*

**Anahtar sözcükler:** Pseudococcidae, anal halka, *Stipacoccus*, *Pararhodania*

**Introduction**

The first detailed study of the mealybug (Hemiptera: Pseudococcidae) fauna of Turkey was by Bodenheimer (1953), who recorded ten species. Later Çanakçioğlu (1977) recorded three species in forest areas and Düzgüneş (1982) recorded 13 species from different areas and habitats. More recently, more than 50 mealybug species (including putoids) have been added to the Turkish fauna as new records (Kaydan et al., 2001a, b, 2004, 2005). In the most recent species list of scale insects of Turkey (Kaydan et al., 2007), among the

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267 species were recorded, including 73 pseudococcid and putoid species in seventeen genera. Later, *Phenacoccus solani* Ferris (Kaydan et al., 2008) *Phenacoccus arambourgi* Balachowky (Ülgentürk et al., 2011) were added to the list. More recently the number of the species of mealybugs known from Turkey has reached 101 (Kaydan & Kozár, 2011).

The monotypic, Palaearctic genera *Pararhodania* Ter-Grigorian, 1964 and *Stipacoccus* Tang, 1992 both belong to the subfamily Phenacoccinae (Hardy et al., 2008). *Pararhodania* is characterized by the adult female having short legs and an incomplete anal ring, lacking dorsal ostioles and trilocular pores, and possessing only multilocular and quinquelocular pores. The type species, *Pararhodania armena* Ter-Grigorian, 1964, was described originally from Armenia on *Artemisia* sp. (Asteraceae) (Ter-Grigorian, 1964). *Stipacoccus* is characterized by the adult female having a complete anal ring that lacks pores but has robust, short setae, oral-collar tubular ducts that are very short and wide, and by lacking cerarii and a circulus. This genus was described for *Stipacoccus xilinhatius* Tang, 1992 from China on *Stipa krylovii* (Poaceae) (Tang, 1992).

Recently, detailed study of mealybugs collected in Turkey on *Achillea* sp. and *Taraxacum* sp. (both Asteraceae) found that they belonged to the monotypic genus *Pararhodania*. When the type material of *P. armena* was examined, it was found that the Turkish specimens were very close to *P. armena*, with some minor differences not considered sufficient to describe a new species because they might only reflect geographic variation. However, the type specimen of *P. armena* is not in good condition as it lacks a small part of the body; because of this we assume that some details were omitted from the original description, such as the apical setae. It was decided therefore to redescribe the species based on the holotype and newly collected material, to clarify the species concept.

Another recent collection made in Turkey at Elmadağ-Ankara, a natural steppe area, was a new species of *Stipacoccus*, found on the grass *Cynodon dactylon*. This plant is grown as lawn grass throughout the warm temperate regions of the world and can become weedy (Anonymous, 2011). The genus *Cynodon* is host to almost 100 species of scale insects from seven families, including almost 60 species of mealybugs (Ben-Dov et al., 2011).

The aim of this article is to redescribe *Pararhodania armena* and describe the new species of *Stipacoccus*.

## Materials and Methods

The mealybug samples were collected from Ankara and Van in Turkey. Specimens were prepared for study by light microscopy using the methods of

Kosztarab & Kozár (1988). The morphological terminology used follows that of Kosztarab & Kozár (1988) and Williams (2005). Measurements and counts given for morphological features of the new species were taken from all available specimens (both type and newly collected material).

Both dry and slide-mounted material of both species is deposited in the Plant Protection Department, Faculty of Agriculture, Yüzüncü Yıl University, Van, Turkey (CCVT) and paratypes will be deposited in ZIAS: St. Petersburg: Zoological Museum, Academy of Science, Russia.

## Results

### Systematics

*Pararhodania* Ter-Grigorian, 1964: 860.

**Type species:** *Pararhodania armena* Ter-Grigorian, 1964: 861.

### Diagnosis:

**Adult female:** Body oval, anal lobes absent. Antenna 7 segmented. Eye situated on margin. Labium 3 segmented. Anterior and posterior spiracles almost same size. Legs well developed, with translucent pores on hind femur and tibia; tarsus shorter than tibia; claw with a denticle; tarsal digitules short, setose; claw digitules thicker than tarsal digitules, capitate. Both anterior and posterior ostioles absent. Circulus absent. Multilocular disc pores present on posterior abdominal segments. Quinquelocular pores present on venter only. Trilocular pores absent. Minute discoidal pores present on dorsum and venter. Oral-collar tubular ducts of one size scattered on dorsum and venter. Anal ring with 6 short setae and two rows of pores. Cerarii absent. Dorsal and ventral body setae hair-like (an addition to the description given by Ter-Grigorian (1964, 1973).

*Pararhodania armena* Ter-Grigorian, 1964: 861. (Figure 1)

**Live appearance:** The females live on the roots of the host plants.

### Material examined:

**Holotype:** Adult ♀, ARMENIA: Urtski Ridge, on *Artemisia* sp. 29.V.1958, collected by Ter-Grigorian. Type depository: St. Petersburg: Zoological Museum, Academy of Science, RUSSIA.

**Additional material:** 6 ♀♀ (on one slide), TURKEY, on *Taraxacum* sp., Van-Muradiye, N: 39°03'388"; E: 043°45'453"; alt: 1817 m; 06.VI.2009, collected by M. B. Kaydan (CCVT: 1696); 3 ♀♀ (each on separate slide), TURKEY, on *Achillea* sp., Van-Çatak, N: 38°06'043"; E: 043°08'141"; alt: 1985 m; 08.VI.2005, collected by M. B. Kaydan (CCVT: 4494).

### Description of slide-mounted adult female

Body elongate oval, 1.42–1.95 mm long, 0.88–1.26 mm wide. Eye situated on margin, 20.0 µm wide. Antenna 7 segmented, 175.0–185.0 µm long; apical segment 45.0–50.0 µm long and 15.0–20.0 µm wide, with 4 fleshy setae each 12.5–17.5 µm long, apical setae each 15.0–17.5 µm long. Clypeolabral shield 125.0–140.0 µm long, 100.0–110.0 µm wide. Labium 85.0–90.0 µm long, 65.0 µm wide. Anterior spiracle 45.0–50.0 µm long, 20.0–25.0 µm wide across atrium; posterior spiracle 50.0–55.0 µm long, 20.0–25.0 µm wide across atrium. Legs well developed; hind coxa 55.0–65.0 µm long, hind trochanter + femur 90–100 µm long, hind tibia + tarsus 90.0–110.0 µm long, hind claw 15.0–17.5 µm long. Ratio of lengths of hind tibia + tarsus to trochanter + femur 1.00–1.10, ratio of lengths of hind tibia to tarsus 1.16–1.44, ratio of length of hind trochanter + femur to greatest width of femur 2.57–3.16. Tarsal digitules subequal, each 7.5–10.0 µm long, setose. Claw with denticle present on plantar surface; claw digitules subequal, each 15.0–17.5 µm long, knobbed. Both anterior and posterior pairs of ostioles absent. Anal ring incomplete at anteriorly, 45.0–50.0 µm wide, bearing 6 setae, each seta 25.0–40.0 µm long.

**Dorsum:** Cerarii absent. Dorsal body setae hair like, each 7.5–17.5 µm long. Multilocular pores few, confined to posterior of abdomen (segments VI–VIII - see discussion under variation). Minute discoidal pores, each 2.0–3.0 µm in diameter, scattered all over body. Oral-collar tubular ducts, each 15.0–16.0 µm long and 5.0–7.5 µm wide at mid-length, scattered on body, sometimes forming a row across each abdominal segment; with 14–16 ducts present on segment I, 14–17 on II, 13–17 on III, 14 or 15 on IV, 12–14 on V, 11 or 12 on VI, 8 or 9 on VII, and 4–10 ducts on segment VIII.

**Venter.** Body setae slender, each 10–35 µm long; apical seta on abdomen 35.0–60.0 µm long. Multilocular disc pores each 7.5–10.0 µm in diameter, present on posterior abdominal segments as follows: 1–7 pores on segment V; 16–32 on VI; 22–28 on VII; and 21–27 pores on segment VIII. Minute discoidal pores, each 2.0–3.0 µm in diameter, scattered all over body. Oral-collar tubular ducts each 12.5–15.0 µm long and 4.0–6.0 µm wide, concentrated on margin of head, thorax and abdominal segments and in rows across median areas, distributed as follows on abdominal segments: 11–17 ducts on segment I, 12–16 on II, 11 or 12 on III, 14 or 15 on IV, 10–12 on V, 7–9 on VI, 8 or 9 on VII, and 3 or 4 ducts on segment VIII.

**Variation:** Number of multilocular pores on dorsum variable; holotype apparently with more (7–9) multilocular pores on segments VI–VIII than specimens collected in Turkey (0–2 pores). These differences were not considered sufficient to describe a new species as they might reflect geographic variation.

**Comment:** This species is a new record for the Turkish scale insect fauna.

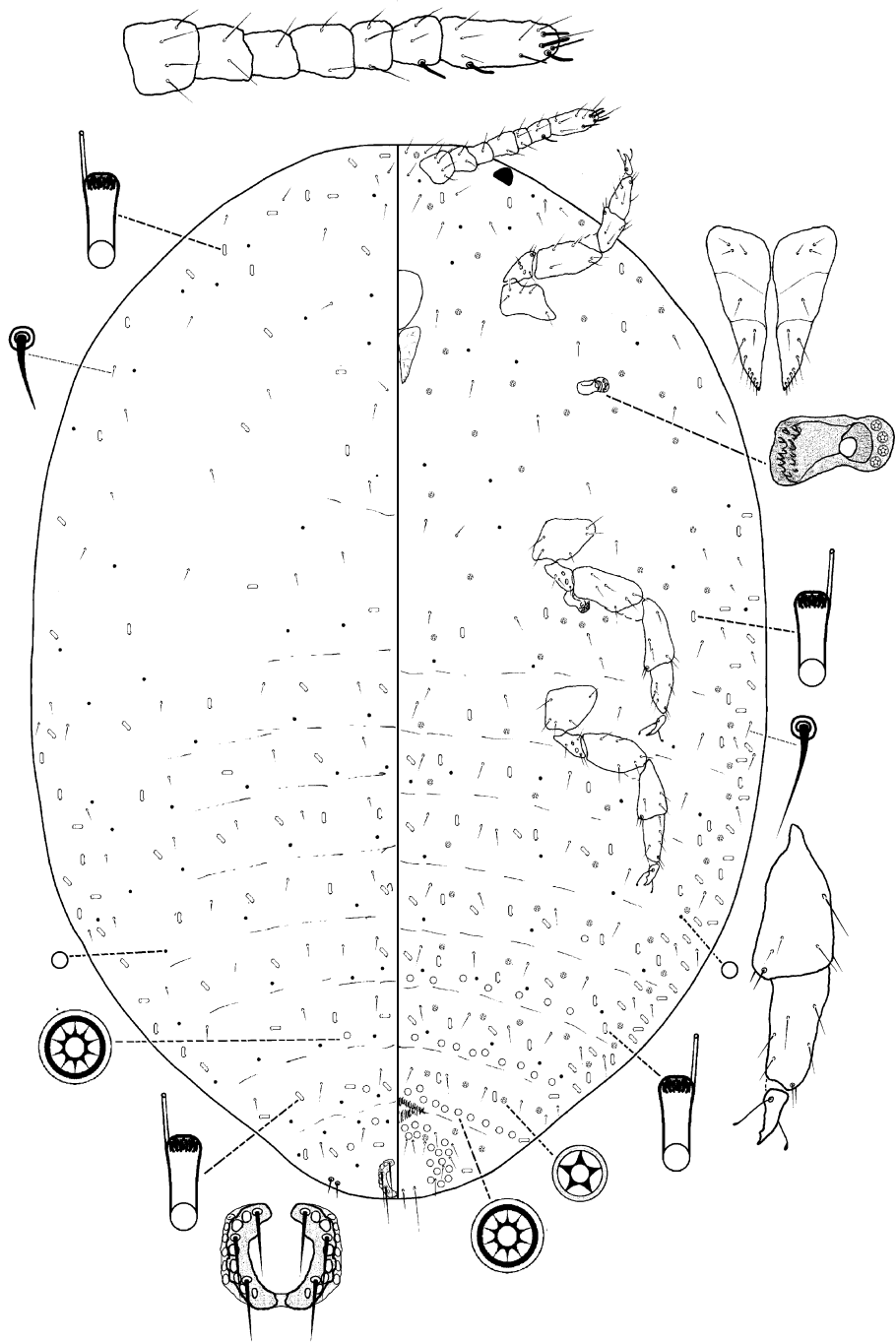


Figure 1. *Pararhodania armena* Ter-Grigorian, adult female (Illustrated by M.B.Kaydan).

***Stipacococcus*** Tang, 1992: 602.

**Type species:** *Stipacococcus xilinhatus* Tang, 1992: 603.

**Diagnosis:**

**Adult female:** Body elongate to oval, anal lobes absent. Antenna 7 or 8 segmented. Eye situated on margin. Labium 3 segmented. Posterior pair of spiracles always larger than anterior spiracles. Legs well developed, tibia stout, tarsus shorter than tibia, claw with denticle present on plantar surface; tarsal digitules setose, claw digitules capitate, thicker than tarsal digitules. Posterior ostioles well developed; anterior ostioles present or absent. Circulus absent. Multilocular disc pores limited to area around vulva or absent. Quinquelocular pores absent. Trilocular pores scattered on dorsum and venter. Oral-collar tubular ducts short and wide, generally situated on body margin, few present on dorsum, more numerous on venter. Anal ring complete, bearing 6 short setae, ring with or without a few pores. Cerarii absent. Dorsal body setae spinose; ventral setae generally short and slender, longest on head. Apical setae short.

***Stipacococcus torosae*** Kaydan & Kozár sp. nov. (Figure 2)

**Live appearance:** The females live inside the leaf sheaths of the host plant.

**Type Material:**

**Holotype:** Adult ♀, TURKEY: on *Cynodon dactylon*, Ankara, Elmadağ Road, 05.X.2001, collected by M. B. Kaydan.

**Paratypes:** 2 adult ♀♀ (each on separate slides), same data as holotype.

**Description of slide-mounted adult female**

Body elongate oval, 2.08–2.88 mm long, 1.18–1.30 mm wide. Eye situated on margin, 20.0–27.5 µm wide. Antenna 7 segmented, 175.0–190.0 µm long; apical segment 55.0–57.5 µm long and 20.0–22.5 µm wide, with 4 fleshy setae each 15.0–25.0 µm long, apical setae each 17.5–20.0 µm long. Clypeolabral shield 125.0–145.0 µm long, 95.0–110.0 µm wide. Labium 50.0–60.0 µm long, 50.0–70.0 µm wide. Anterior spiracles 45.0–52.5 µm long, 27.5–35.0 µm wide across atrium; posterior spiracles 50.0–62.5 µm long, 32.5–35.0 µm wide across atrium. Legs well developed; hind coxa 50.0–70.0 µm long, trochanter + femur 120.0–135.0 µm long, tibia + tarsus 155.0–160.0 µm long, claw 15.0–20.0 µm long. Ratio of lengths of hind tibia + tarsus to trochanter + femur 1.18–1.33, ratio of lengths of hind tibia to tarsus 1.46–1.58, ratio of length of hind trochanter + femur to greatest width of femur 4.00–5.16. Tarsal digitules subequal, setose, each 7.5–15.0 µm long. Claw digitules subequal, knobbed, each 15.0–17.5 µm long. Translucent pores present on hind femur (numbering 8–10) and tibia (19–25). Only posterior pair of ostioles present; no pores and setae associated with ostioles. Anal ring complete, with 4–7 pores present on each side, ring 45.0 µm wide, bearing 6 anal-ring setae, each seta 35.0–40.0 µm long.



**Dorsum:** Cerarii absent. Dorsal body setae spinose, each 7.5–12.5 µm long. Trilocular pores, each 4.0–5.0 µm in diameter, scattered all over body. Oral-collar tubular ducts, each 10.0–12.5 µm long and 6.0–7.5 µm wide at mid-length, confined to body margin, with 2 ducts on abdominal segment I, 2 on II, 2 or 3 on III, 2 on IV, 4 or 5 on V, 6 on VI, 5 or 6 on VII, and 6 or 7 ducts on segment VIII.

**Venter.** Body setae slender, each 15.0–35.0 µm long; apical seta on abdomen 60.0–75.0 µm long. Multilocular disc pores numbering 3 or 4, present only on last abdominal segment. Trilocular pores each 3.0–4.0 µm in diameter, scattered all over body. Oral-collar tubular ducts each 8.0–11.0 µm long and 5.0–6.0 µm wide, present on margin and submargin of each segment; distributed on abdominal segments as follows: 9 or 10 ducts on segment I, 10–12 on II, 12 on III, 9–12 on IV, 8–15 on V, 10 or 11 on VI, 8–10 on VII, and 9 on segment VIII.

#### **Diagnosis of adult female:**

*Stipacoccus torosae* sp. nov. can be diagnosed by the following combination of features: translucent pores present on hind femur and tibia; cerarii absent; anal ring reduced but complete, with a few pores present; circulus absent; multilocular pores present only on venter of abdominal segment VIII and IX (3 or 4); only posterior ostioles present; antenna usually 7 segmented, 175.0–190.0 µm long; apical segment 55.0–57.5 µm long and 20.0–22.5 µm wide; oral-collar tubular ducts short and wide, with a length to width ratio of 1.6–1.8.

*Stipacoccus torosae* sp. nov. resembles *S. xilinhatu*s in having most of the above-mentioned features, but differs from *S. xilinhatu*s by having (character states of *S. xilinhatu*s in brackets): (i) multilocular pores present on venter (no multilocular pores), (ii) numerous trilocular pores on venter and dorsum (very few trilocular pores, especially on dorsum), (iii) anterior ostioles absent (present).

**Etymology:** The new species is named in honor of Prof. Dr. Seval TOROS (Ankara University, Agriculture Faculty, Plant Protection Department, Dışkapı, Ankara, Turkey), who has made valuable studies on the aphidology of Turkey.

## **Özet**

### ***Stipacoccus* Tang cinsinden yeni bir türün tanımlanması ve *Pararhodania armena* Ter-Grigorian'ın yeniden tanımlanması (Hemiptera: Coccoidea: Pseudococcidae)**

Çalışmada Ankara'dan *Cynodon dactylon* L. (Poaceae) üzerinden toplanan yeni tür *Stipacoccus torosae* Kaydan & Kozár sp. nov. ergin dişi özelliklerine göre tanımlan-



mıştır. Ayrıca *Pararhodania armena* Ter-Grigorian, 1964 tip materyali ve Van'dan toplanan yeni materyaller kullanılarak yeniden tanımlanmıştır.

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