

A new armored scale species from Iran (Hemiptera: Coccoomorpha: Diaspididae)

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Abstract

A new armored scale species, *Aspidiotus mousavii* sp. nov. (Hemiptera: Coccoomorpha: Diaspididae) is described and illustrated. The specimens were collected on *Matthiola revoluta* (Brassicaceae) in Semnan province, Iran.

Key words. *Aspidiotus mousavii* sp. n., Coccoomorpha, Diaspididae, *Matthiola revoluta*, Iran.

معرفی گونه جدیدی از شپشک‌های سپردار از ایران

(Hemiptera: Coccoomorpha: Diaspididae)

معصومه مقدم

موسسه تحقیقات گیاه‌پزشکی کشور، بخش تحقیقات رده‌بندی حشرات

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چکیده

گونه جدیدی از شپشک‌های سپردار، (*Aspidiotus mousavii* sp. nov. (Hemiptera: Coccoomorpha: Diaspididae)) از استان سمنان، توصیف و ترسیم شده است. جمع آوری شده از روی گیاه میزبان *Matthiola revoluta* (Brassicaceae) در استان سمنان، توصیف و ترسیم شده است. واژگان کلیدی: *Aspidiotus mousavii* sp. n. گونه جدید، Diaspididae، شپشک‌های سپردار، *Matthiola revoluta* ایران.

دریافت: ۱۳۹۶/۸/۲۴، پذیرش: ۱۳۹۶/۱۱/۱۸.

Introduction

The genus *Aspidiotus* Bouché includes 98 species worldwide (Garcia Morales *et al.* 2017). This genus is characterized by following combination of morphological features: (i) 3 pairs of well-developed lobes; (ii) median lobes usually with lateral notches on outer or both edges; (iii) small paraphyses arising from bases of median to third lobes; (iv) plates as long as or slightly longer than lobes, present laterally as far forward as the fifth segment, and becoming simpler beyond third lobe; (v) dorsal macroducts usually fairly long and slender; (vi) prepygidial submarginal ducts present; (vii) anterior spiracles each with an associated area of dermal granulation, and (viii) antennae often with sclerotized spur, and each bearing one robust seta (Williams & Watson, 1988). Takagi (1969) considers the natural distribution of the genus as Afro-Asiatic. The highly polyphagous and cosmopolitan species *A. destructor* Signoret and *A. nerii* (Bouché) (Garcia Morales *et al.*, 2017), are believed to be accidentally introduced in Iran (Kaussari, 1968; Moghaddam, 2013) where currently known from urban

landscapes in the northern and central provinces (Moghaddam, 2015) and southern areas respectively (Moghaddam, 2013).

This paper presents the description of a new species in the genus *Aspidiotus* collected on *Matthiola revolute* ((Brassicaceae) from Semnan province, Iran.

Material and methods

All specimens were stained and mounted on microscope slides according to the protocol by Williams & Watson (1988). In the Fig. 1, the left side of the main drawing is the dorsum and the right, the venter. Other structures around the main figure are drawn enlarged but not all to the same scale. The morphological terminology follows Williams & Watson (1988).

The holotype and paratypes are deposited in the Scale Insect Collection of Hayk Mirzayans Insect Museum (HMIM), Insects Taxonomy Research Department (ITRD), Iranian Research Institute of Plant Protection (IRIPP), Tehran, Iran.

Aspidiotus mousavii Moghaddam, n. sp.

HOLOTYPE adult , Iran, Semnan province, Semnan, 5 km W. Momen-abad, 35°32'40" N, 53°17'53" E, 1100–1130 m. a.s.l., on *Matthiola revolute* ((Brassicaceae), 31.v.1995, Mosavi & Termeh, coll., No: 2880 (HMIM).

PARATYPS, Iran, same data as holotypes, 9 adults (HMIM).

Description

Living appearance [Fig. 1 (A and B)]: Scale cover of the adult female moderately convex, circular, light brown to white in color, with two central exuviae, brown to orange in color; scale 1.7–2.0 mm diameter. Male species unknown.



Fig. 1. (A and B) Living appearance adult female of *Aspidiotus mousavii* Moghaddam sp. n.

Mounted female (Fig. 2): Adult female on microscopic slide almost circular, 0.53–0.63 mm long, 0.52–0.56 mm wide, body membranous, pygidium lightly sclerotized. Pygidium with 3 pairs of lobes; median lobes (L_1), each about 10 μm long and 8 μm wide, separated by a space about 8 μm wide, slightly convergent, each outer margins with 1 notch; second lobes (L_2), smaller than median lobes, about 8 μm long and 6 μm wide, each outer margin with 1 notch; third lobes pointed, resembling plate, 2 or 3 notches on lateral margin and membranous. Plates well developed, longer than lobes, especially near third lobes; deeply and finely fringed on outer margins; with 2 conspicuous apically fringed plates present between median lobes, 2 between median and second lobes, 3 between second and third lobes, and with 8 plates present lateral to third lobes on each side, tapering, and simpler as the distance from third lobe increases.

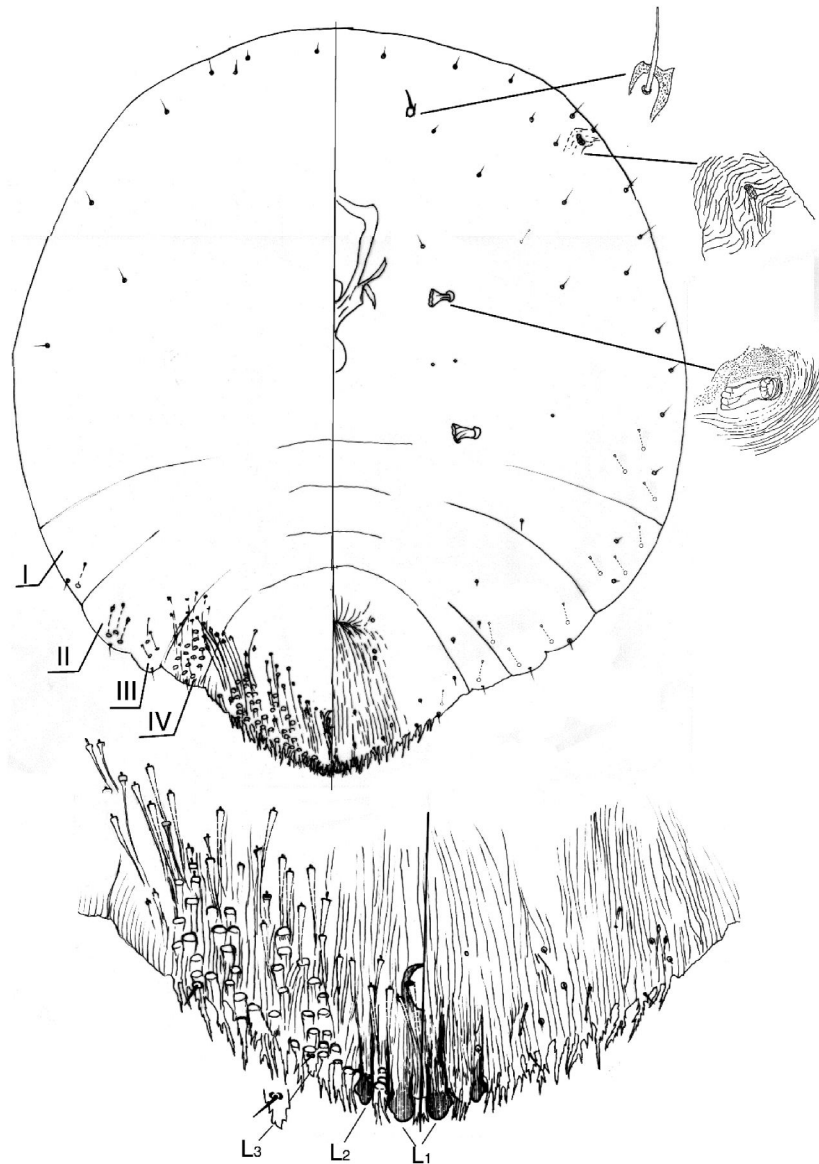


Fig. 2. Adult female of *Aspidiotus mousavii* Moghaddam, sp. n.

Dorsum. Anal ring oval, about 14 μm wide and 16 μm long, nearly twice as wide as median lobe; situated at posterior third of pygidium from apical. Paraphyses small, arising from bases of median and second lobes. Dorsal pygidial macroducts slender, 32–38 μm long, about 10 times as long as wide; 1 macroduct present between median lobes; 3 or 4 between second and median lobes on each side; pygidial macroducts forming 2 slightly irregular furrows between second and third lobes with 13–17 ducts; and 3 irregular furrows with 17–24 ducts on segments V. Prepygidial segments with submarginal macroducts, smaller than pygidial macroducts; 10–14 on segment IV, 2–4 on each segments II and III, and 1 or 2 on segment I.

Venter. Venter of pygidium without perivulvar pores. Microducts present submarginally on prepygidial segments and metathorax, and 1 or 2 on pro- and mesothorax. Spiracles without disc pore, anterior spiracles each with an associated area of dermal granulation. Antennae each with 1 sclerotized spine and 1 robust seta. Anterior spiracles each with an associated area of dermal granulation. Thoracic tubercle sclerotized never prominent present.

Comments. This new species is placed in *Aspidiotus* on the basis of having (i) three pairs of well-developed lobes, (ii) well-developed plates, (iii) 7 or 8 plates lateral to third lobe, deeply fringed apically, (iv) anterior spiracles each with an associate area of dermal granulation. *A. mousavii* differs from all *Aspidiotus* species in possessing (i) third lobes resembling plate and not sclerotized; and (ii) ventral microduct absent from near anterior spiracles. Although Balachowsky (1948, 1958) did not specify the positions of microduct and dermal granulation associated anterior spiracles, Williams and Watson (1988) emphasized the importance of these features for distinguishing this genus from its closely related genera.

This species is superficially similar to *A. paolii* Balachowsky for the absence of the perivulvar pores, and presence of dorsal prepygidial ducts, while is different in the (i) plate form of third lobes (same of the second lobes with one outer notch), (Balachowsky, 1958).

Etymology. The species is named after M. Mousavi (Department of Botany, Iranian Research Institute of Plant Protection, Tehran, Iran) who collected the host plant which was associated with the diaspidid specimens.

Acknowledgments

I would like to express my sincere appreciation to Dr. D.J. Williams for his kindness and continuous guidance and encouragement through my research on the scale insect fauna of Iran. Miss S. Sajedi (Department of Botany, Iranian Research Institute of Plant Protection, Tehran, Iran) is thanked for providing the plant material, I am also grateful to Dr. M. Parchami-Araghi, the colleague in the Insect Taxonomy Research Department (ITRD), for his helpful checking English of manuscript.

References

- Balachowsky, A.S.** (1956) Les cochenilles du continent Africain Noir. V. 1 - Aspidiotini (1ère partie). *Annales du Musée Royal du Congo Belge* (Sciences Zoologiques). Tervuren 3: 1–142.
- García Morales M., Denno B.D., Miller D.R., Miller G.L., Ben-Dov Y. & Hardy N.B.** (2017) *ScaleNet: A literature-based model of scale insect biology and systematics*. Database. doi: 10.1093/database/bav118. <http://scalenet.info> [Accessed 14th November 2017].
- Kaussari, M.** (1969) *Monographie des Coccoidea de l'Iran*. Ministry of Agriculture Research Agronom Bulltin. Tehran, Iran. 72 + 12 pp.
- Moghaddam, M.** (2013) An annotated checklist of the scale insects of Iran (Hemiptera, Sternorrhyncha, Coccoidea) with new records and distribution data. *Zookeys* 334, 1–92.
- Moghaddam, M.** (2015) Scale insects of ornamental plants in Iran (Hem.: Sternorrhyncha: Cocomorpha). *Journal of Entomological Society of Iran*; 34 (4): 83–91.
- Takagi, S.** (1969) Diaspididae of Taiwan based on material collected in connection with the Japan-U.S. Co-operative Science Programme, 1965 (Homoptera: Coccoidea). Part I. *Insecta Matsumurana* 32: 1–110.
- Williams, D.J. & Watson, G.W.** (1988) *The Scale Insects of the Tropical South Pacific Region. Pt. 1. The Armoured Scales (Diaspididae)*. CAB International Wallingford, U.K. 290 pp.
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