

First description of the queen of the ant *Solenopsis saudiensis* Sharaf & Aldawood (Hymenoptera: Formicidae) from Saudi Arabia

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The queen of the ant *Solenopsis saudiensis* Sharaf & Aldawood, 2011 is described for the first time from Riyadh, Kingdom of Saudi Arabia. A provisional key to the two Saudi Arabian species of the genus is presented based on the queen caste. Brief ecological and biological notes are also given.

Keywords: Arabian Peninsula, Middle East, Palaeartic, date palm, taxonomy, ants.

Introduction

Solenopsis Westwood, 1840 is one of the largest ant genera in the subfamily Myrmecinae including 193 species (Bolton, 2013), distributed worldwide in the tropics and warm temperate regions (Brown, 2000; Pacheco & Mackay, 2013). Workers of the genus *Solenopsis* can be recognised by the characters mentioned by Ettershank (1966), Bolton (1994), Sharaf, Taylor, and Klingenberg (2009) and Sharaf and Aldawood (2012). The queen caste can be identified by the following characteristics as presented by Ettershank (1966) and Bolton (1994): Larger than the conspecific worker; usually, one more antennomere than workers, antennae often 11-segmented, sometimes 10-segmented, always with a 2-segmented club; propodeum strongly rounded; petiolar node broader than in the worker; and postpetiole broadly attached to the gaster.

The first contribution on the Arabian *Solenopsis* was published by Collingwood and Agosti (1996) describing three new species, *S. omana* from Oman, and *S. sumara* and *S. zingibara* from Yemen. A year later, *S. geminata* (Fabricius, 1804) was reported from the UAE (Collingwood, Tigar, & Agosti, 1997). The genus was recorded for the first time from the Kingdom of Saudi Arabia by the species *S. saudiensis* Sharaf & Aldawood from Riyadh region based on the worker caste (Sharaf & Aldawood, 2011). Recently, the genus was revised for the Arabian Peninsula by Sharaf & Aldawood (2012) recognizing six species, *S. elhawagryi* Sharaf & Aldawood, *S. geminata* (Fabricius), *S. omana* Collingwood & Agosti, *S. saudiensis* Sharaf & Aldawood, *S. sumara* Collingwood & Agosti and *S. zingibara* Collingwood & Agosti. *Solenopsis elhawagryi* was described from southwestern mountains of Saudi Arabia based on worker and queen castes (Sharaf & Aldawood, 2012). These authors presented a key to the Arabian species supported by automontage photographs and Scanning Electron Micrographs and redescribed the worker caste of *S. sumara*. Since then, additional specimens of *S. saudiensis*, including two dealated queens in association with several workers, have been collected by the second author (S.S.) from the King Saud University campus in Riyadh. Herein, we describe the queen caste of *S. saudiensis* and give a provisional key to the queens of both Saudi Arabian species.

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Measurements and Indices

Measurements [in mm] and indices follow the standards by Bolton (1987): **TL** = Total Length; the outstretched length of the ant from the mandibular apex to the metasomal apex. – **HW** = Head Width; the maximum width of the head behind eyes in full face view. – **HL** = Head Length; the maximum length of the head, excluding the mandibles. – **CI** = Cephalic Index ($HW \times 100/HL$). – **SL** = Scape Length, excluding basal neck. – **SI** = Scape Index ($SL \times 100/HW$). – **EL** = Eye Length; the maximum diameter of the eye. – **ML** = Mesosoma Length; the length of the mesosoma in lateral view, from the point at which the pronotum meets the cervical shield to the posterior base of the propodeal lobes or teeth. – **PL** = Petiole Length; the maximum length measured in dorsal view, from the anterior margin to the posterior margin. – **PW** = Petiole Width; maximum width measured in dorsal view. – **PPL** = Postpetiole Length; maximum length measured in dorsal view. – **PPW** = Postpetiole Width; maximum width measured in dorsal view.

Results

Solenopsis saudiensis Sharaf & Aldawood, 2011 (Figures 1–3)

Material: SAUDI ARABIA: 2 dealated queens, Riyadh, King Saud University campus, 24°42.832'N, 46°37.534'E, 660 m.a.s.l., 04.iv.2014 (S. Salman leg.); Deposited in the King Saud University Museum of Arthropods (KSMA), College of Food and Agriculture Sciences, King Saud University, Riyadh, Kingdom of Saudi Arabia.

Measurements (Queen): TL 3.32-3.57; HL 0.53-0.55; HW 0.46-0.50; SL 0.33-0.35; EL 0.12-0.17; ML 1.00-1.07; PL 0.22- 0.25; PW 0.20-0.22; PPL 0.17-0.18; PPW 0.25-0.27; Indices: SI 70-72; CI 87-91 (n=2).

Description: Colour uniformly dark brown, antennae, mandibles and legs clear yellow. – Head: slightly longer than broad with feebly convex sides and weakly concave posterior margin; scapes and funiculus with subdecumbent pubescence; masticatory margin of mandibles armed with four teeth decrease gradually in size from apex to base; median anterior clypeal margin concave; eyes large (EL 0.24-0.36x HW), with about 18 ommatidia in the longest row. – Mesosoma: robust, in dorsal view elongate and clearly bilaterally compressed; propodeal spiracle circular; propodeal dorsum about twice longer than propodeal declivity in profile. Petiole with a relatively long peduncle; and petiolar dorsum in profile short with a long curved anterior margin and straight vertical posterior margin. Postpetiole in profile, slightly lower than petiole; postpetiole in dorsal view slightly broader than petiole. – Sculpture: cephalic dorsum shiny and smooth apart from distinct hair pits; area between antennal insertions faintly longitudinally striated; mesosomal dorsum superficially sculptured slightly shining; mesosomal sides smooth and shining; propodeal dorsum very faintly transversally striated; petiole and postpetiole superficially sculptured and dull; gaster superficially granulate and slightly shining. – Pilosity: cephalic dorsum with abundant long yellow hairs; eyes with numerous projecting yellow hairs among ommatidia; mesosoma, petiole, postpetiole and gaster with abundant, suberect, long yellow hairs.

Ecological notes: Two queens and several workers were found nesting in soil at the base of a date palm tree (*Phoenix dactylifera* L.) in Riyadh. Specimens were collected by sifting the soil which was a mixture of sandy loam with much decaying organic materials. Thick thatch surrounded the tree trunk. This area is a part of gardens of the King Saud University campus, in Riyadh, Saudi Arabia, and is regularly irrigated so the soil is relatively moist. Several workers were observed foraging in the area up to approximately a metre from the nest. Collections of *S. saudiensis* strongly indicate that this species is associated with irrigated date palm orchards in the central desert region of



Figures 1–2. Queen of Sharaf & Aldawood in profile and dorsal view (antweb.org, CASENT0914333, Photographer: Michele Esposito).

Saudi Arabia, whereas *S. elhawagryi* seems to be associated with wild Acacia forests of the southwestern mountainous region of the country (Sharaf & Aldawood, 2012)..

Distribution: Since the description of *S. saudiensis*, the authors have made extensive collecting efforts to understand the species distribution. As a result, *S. saudiensis* is now recorded from additional sites in the Riyadh region and the data of these individuals are as follow: Riyadh, Rawdhat Khorim (25°38.434'N, 47°27.866'E), 559 m, 13.i.2014 (2); Riyadh, Alhayer (24°33.465'N, 46°44.469'E), 587m, 9.x.2013 (2); Riyadh, Alhayer (24°33.465'N, 46° 44.469'E), 587m, 10.x.2013 (3).



Figure 3. Queen of Sharaf & Aldawood in profile, head in full-face view (antweb.org, CASENT0914333, Photographer: Michele Esposito).

Distinguishing features of the queens of *Solenopsis saudiensis* and *S. elhawagryi*

- Smaller species, TL 3.32-3.57; HL 0.53-0.55; HW 0.46-0.50; SL 0.33-0.35; ML 1.00-1.07; PPL 0.17-0.18; eyes with about 18 ommatidia in the longest row; postpetiole without a small tooth-like process; propodeal dorsum about twice longer than propodeal declivity in profile; mesosoma in dorsal view elongate and clearly bilaterally compressed; mesosomal dorsum and gaster superficially sculptured, slightly shining; and petiole and postpetiole superficially sculptured and dull (Figures 1-3) *saudiensis* Sharaf & Aldawood
- Larger species, TL 4.30; HL 0.75; HW 0.65; SL 0.47; ML 1.40; PPL 0.25; eyes with more than 25 ommatidia in the longest row; postpetiole with a small distinct anteroventral tooth-like process which bears several long hairs; propodeal dorsum as long as propodeal declivity in profile; mesosoma in dorsal view robust, broad and not bilaterally compressed; and entire body smooth and shining *elhawagryi* Sharaf & Aldawood

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