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## Monograph

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# Faunal composition, diversity, and distribution of ants (Hymenoptera: Formicidae) of Dhofar Governorate, Oman, with updated list of the Omani species and remarks on zoogeography

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**Abstract.** The Sultanate of Oman is a country on the southeastern corner of the Arabian Peninsula, near the intersection of the Afrotropical, Palearctic, and Indomalayan biogeographic realms. We surveyed ants at 18 sites between 16 and 22 November 2017 using beating sheets, hand picking, Malaise traps, sifting trays, sweeping net, and light traps on the coastal plains and monsoon slopes of Dhofar Governorate in southwest Oman, an area that is relatively verdant due to its exposure to monsoons between June and September. We collected 37 ant species, including 11 species recorded for the first time from Oman: *Camponotus diplopunctatus* Emery, 1915, *Cardiocondyla minutior* Forel, 1899, *Cardiocondyla wroughtonii* (Forel, 1890), *Carebara arabica* (Collingwood & van Harten, 2001), *Leptanilla islamica* Baroni Urbani, 1977, *Monomorium clavicorne* André, 1881, *Monomorium floricola* (Jerdon, 1851), *Monomorium sahlbergi* Emery, 1898, *Strumigenys membranifera* Emery, 1869, *Anochetus sedilloti* Emery, 1884, and *Hypoponera ragusai* (Emery, 1894). In total, 130 ant species are now known from Oman, including 53 from Dhofar. The known ants of Dhofar are primarily of Afrotropical origin (23 species, 43%), followed by Palearctic (20 species, 38%), and Indomalayan (4 species, 8%), and a single species from both the Malagasy and Neotropical Regions (1%). Five species (9%) are apparently endemic to Dhofar, *Lepisiota dhofara* Collingwood & Agosti, 1996, *Lepisiota elbazi* Sharaf & Hita Garcia, 2020, *Crematogaster jacindae* Sharaf & Hita Garcia, 2019, *Meranoplus mosalahi* Sharaf, 2019, and *Nesomyrmex micheleae* Sharaf, 2020. The zoogeography of the Omani ant fauna reflects a clear dominance of faunal elements from the Palearctic Region (68 species, 53%) followed by Afrotropical faunal elements (45 species, 34%), and five species that are broadly spread throughout both the Palearctic and the Afrotropical Regions (4%). There are nine species (6%) from the Indomalayan

Region, two species from the Neotropical Region (2%), *T. melanocephalum*, *C. emeryi*, and a single species *Ph. megacephala* (1%) from the Malagasy Region. The number of endemic species (15 species, 12%) is relatively low compared to the large geographical area of Oman and the broad diversity of habitats that characterizes the country.

**Keywords.** Afrotropical Region, faunal list, Middle East, new synonymy, Palearctic Region.

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## Introduction

Ants are among the most highly abundant and ecologically significant faunal groups on Earth (Hölldobler & Wilson 1990, 1994; Andersen 2000). Patterns of ant diversity on the Arabian Peninsula, however, are well-documented only for parts of Saudi Arabia (Collingwood & Agosti 1996; Sharaf *et al.* 2018a, 2019, 2020a, 2021). For most other neighboring countries, records of ant taxa have been published primarily in a small-scale faunal studies and new species descriptions (e.g., Sharaf *et al.* 2016a, 2016b, 2017a, 2017b, 2017c, 2018a, 2019). In the present study, we surveyed ants of Dhofar, the largest governorate of the Sultanate of Oman (Fig. 1), and compiled records of all ant species known from Oman.

Oman is located on the southeastern corner of the Arabian Peninsula (Fig. 1), at the convergence of the Arabian Gulf and Arabian Sea in southwest Asia. The majority of Oman belongs to the central deserts of the Arabian Peninsula and the Rub' al-Khali extends along the northern border of southern and central-western Oman. Our study sites, on the coastal plains and monsoon slopes of Dhofar Governorate in southwest Oman, however, have remarkable periods of verdancy: June–August, the Khareef, a wet period with high rates of vegetative growth; September–November, a transition period, when generative growth occurs with the peak flowering period; December–May, dry period when trees shed their leaves and plants enter dormancy (Allen 2016; CIAWF 2020).

Dhofar has a great diversity of natural habitats, including deserts and mountains with green forests that descend onto a flat plain with sandy beaches. Dhofar's coastal plain has fertile alluvial soil, well-watered by the southwest monsoon, with numerous freshwater springs that flow abundantly throughout the year. Hence, this part of Dhofar looks strikingly different from most parts of the Arabian Peninsula. Wooded mountain ranges, with many valleys cloaked in greenery from June to September each year, rising to ~1850 meters (Jebel Samhan), form a crescent there behind a long, narrow coastal plain, on which the provincial capital of Şalalah is located (Waterston & Pittaway 1991; Pederzani 2003; Al-Awadhi *et al.* 2011). The region includes unique botanical ecosystems that support rich floral diversity (Miller & Morris 1988; Mosti *et al.* 2006, 2012; El-Sheikh 2013; Patzelt 2014), and fauna characterized by a high degree of species endemism (Arnold 1980; Larsen & Larsen 1980; Cowie 1989; Waterston & Pittaway 1991; Schneider & Krupp 1993; Platia & Schimmel 1997; Taiti *et al.* 2000; Hausmann 2009; Pesenko & Pauly 2009; Šmíd 2010; Melnikov & Pierson 2012; Neubert & van Damme 2012; Ball 2014; Hájek & Reiter 2014; Ball *et al.* 2015; Sharaf & Aldawood 2019).

There is no previous inventory of the ant fauna of Dhofar, which has published records of just 21 ant species scattered in a few paper (Collingwood 1985; Collingwood & Agosti 1996; Sharaf *et al.* 2016a; Sharaf & Aldawood 2019), including descriptions of *Cataglyphis urens* Collingwood, 1985, *Lepisiota dhofara* Collingwood & Agosti, 1996, and *Meranoplus mosalahi* Sharaf, 2019.

The location of Oman in the southeastern region of the Arabian Peninsula is of particular interest because it is at the convergence of three zoogeographical realms, the Palearctic, Afrotropical, and Indomalayan



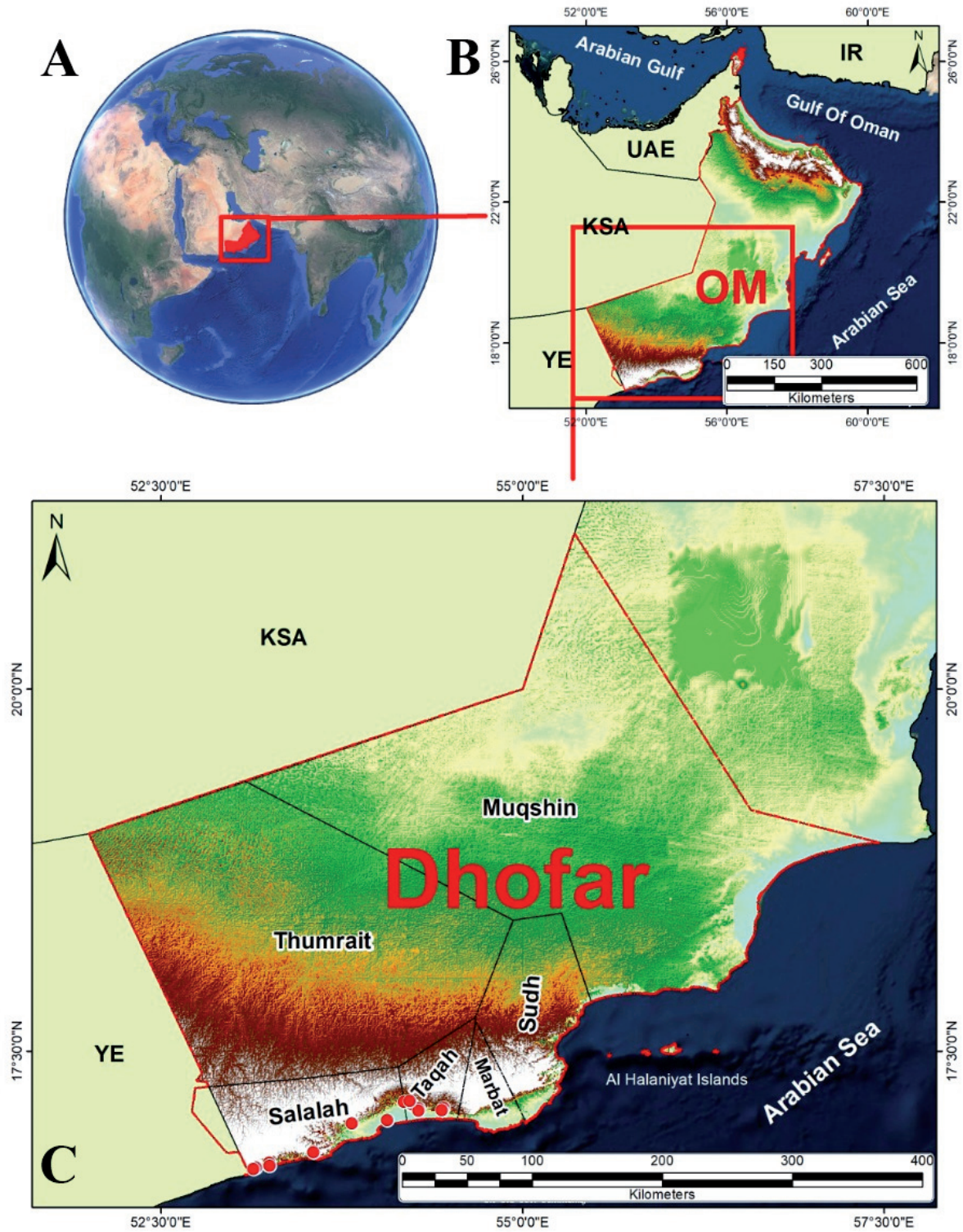


Fig. 1. A–B. Oman and adjacent continental land masses. C. Dhofar Governorate.

biogeographic regions (Cowie 1989; Waterston & Pittaway 1991). Faunal similarities to the Afrotropical Region (Polak & Verovnik 2009; Neubert & van Damme 2012; Ball 2014; Hájek & Reiter 2014) have been previously indicated for other taxa in Oman, but knowledge of the ant fauna of Oman included little information from Dhofar. The aims of the present work, therefore, are to compile the first comprehensive list of Dhofar ant species, evaluate the zoogeographical affinities, possible biological invasion, and the degree of endemism, and provide new ecological information on species habitats and distributions.

## Material and methods

Between 16 and 22 November 2017, the senior author carried out a myrmecological inventory at 18 sites in Dhofar Governorate (Fig. 1, Table 1) covering major habitats of six regions on the coastal plains and monsoon slopes: Ayn Dirbat, Ayn Hamran, Ayn Razat, Ayn Sahlanot, Dhalkout Forest, and Salalah. Habitats included agricultural and native floral areas and forests in highland and lowland ecosystems. Collecting techniques involved vegetation beating, sweep nets, sifting soil and litter, light traps, Malaise traps, and direct hand collecting under tree bark, in decaying fruits, in rotten logs, and beneath rocks. Specimens were collected using an aspirator, preserved in 96% ethanol, mounted, and identified using the keys of Bolton (1980, 1987, 1994), Collingwood (1985), Collingwood & Agosti (1996), Collingwood *et al.* (2004), Sharaf & Aldawood (2013), and Sharaf *et al.* (2014, 2016a, 2016b, 2017a, 2017b, 2018a, 2018b, 2019, 2020a, 2021). Specimens were also compared with images of types and other specimens and are available on [www.AntWeb.org](http://www.AntWeb.org).

## Abbreviations

m	=	male
mw	=	minor worker
q	=	queen
s	=	soldier (major worker)
TL	=	Total length
w	=	worker or workers

## Collecting methods

BS	=	Beating sheet
HP	=	Hand picking
LT	=	Light trap
ML	=	Malaise trap
SF	=	Litter and soil sifting
SW	=	Sweep net

## Institution and museum abbreviations

The collection abbreviations follow Evenhuis (2019) and Brandão (2000).

CASC	=	California Academy of Sciences collection, California Academy of Sciences, San Francisco, California, USA
KSMA	=	King Saud University Museum of Arthropods, Plant Protection Department, College of Food and Agriculture Sciences, King Saud University, Riyadh, Kingdom of Saudi Arabia
MHNG	=	Muséum d'Histoire Naturelle, Geneva, Switzerland
MNHN	=	Muséum national d'histoire naturelle, Paris, France
MSNG	=	Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy
NHMB	=	The Naturhistorisches Museum, Basel, Switzerland
NHMW	=	Naturhistorisches Museum, Wien, Austria
WMLC	=	World Museum Liverpool, Liverpool, UK

**Table 1.** The locations and GIS coordinates of sites from which ant specimens are collected in the Dhofar Governorate.

Locality	Latitude	Longitude	Habitat
Ayn Sahlanot	17.148	54.179	Mountaineous forest
Ayn Sahlanot	17.147	54.180	Mountaineous forest
Ayn Dirbat	17.106	54.453	Mountaineous forest
Salalah	17.019	54.065	Urban
Salalah	17.152	54.219	Urban
Dhalkout	16.727	53.249	Mountaineous forest
Dhalkout	16.705	53.245	Mountaineous forest
Dhalkout	16.693	53.156	Mountaineous forest
Dhalkout	16.684	53.140	Mountaineous forest
Dhalkout	16.707	53.251	Mountaineous forest
Dhalkout Rd, Aghbaroot	16.798	53.554	Mountaineous forest
Agdaroot	17.089	54.442	Mountaineous forest
Ayn Razat	17.124	54.238	Mountaineous forest
Ayn Razat	17.130	54.236	Mountaineous forest
Ayn Hamran	17.100	54.284	Mountaineous forest
Ayn Hamran	17.086	54.280	Mountaineous forest
Ayn Ashat	16.998	53.820	Grassland
Serfeet Rd	16.684	53.139	Grassland

Species names follow the online catalogue of Bolton (2021). Digital color images of each species including profile and dorsal views of body and full-face views of the head were created using a Leica DFC450 digital camera with a Leica Z16 APO microscope and LAS (ver. 3.8) software. The images are accessible using the unique identifying specimen code (e.g., CASENT0922883) and are available online on AntWeb (2022) ([www.AntWeb.org](http://www.AntWeb.org)). Terminology of surface sculpture follows Harris (1979). The studied material is deposited in KSMA. Information on species distribution and ecology is based on field observations, literature's data and ant websites (e.g., [www.AntWeb.org](http://www.AntWeb.org) and [www.antwiki.org](http://www.antwiki.org)).

## Results

Class Insecta Linnaeus, 1758  
 Order Hymenoptera Linnaeus, 1758  
 Suborder Apocrita Latreille, 1810

Family **Formicidae** Latreille, 1809

The senior author collected 37 ant species in Dhofar, including 11 species recorded for the first time from Oman: *Camponotus diplopunctatus* Emery, 1915, *Cardiocondyla minutior* Forel, 1899, *Cardiocondyla wroughtonii* (Forel, 1890), *Carebara arabica* (Collingwood & van Harten, 2001), *Leptanilla islamica* Baroni Urbani, 1977, *Monomorium clavicornis* André, 1881, *Monomorium floricola* (Jerdon, 1851), *Strumigenys membranifera* Emery, 1869, *Anochetus sedilloti* Emery, 1884, and *Hypoconerops ragusai* (Emery, 1894). In total, 130 ant species are now known from Oman, including 53 from Dhofar (see Appendix)

### **Species accounts**

Subfamily Dolichoderinae Forel, 1878

Genus *Tapinoma* Foerster, 1850

*Tapinoma melanocephalum* (Fabricius, 1793)

Fig. 2

*Formica melanocephala* Fabricius, 1793: 353 (w) French Guiana. Neotropic.

#### **Diagnosis**

A small (TL 1.2–2 mm) bicolored species with brown head, mesosoma light brown, gaster, legs, and antennae yellow; scapes when laid back from their insertions surpass posterior margin of head by about length of first funicular segment; mesosoma broadened anteriorly in dorsal view and without setae; metanotal groove shallowly impressed; propodeal declivity at least 3× as long as propodeal dorsum.

#### **Material examined**

OMAN – **Dhofar** • 3 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SW; M.R. Sharaf leg.; KSMA • 2 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; ML; M.R. Sharaf leg.; KSMA • 2 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 11 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 10 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 7 w; Dhalkout; 16.705° N, 53.245° E; alt. 43 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Salalah; 17.019° N, 54.111° E; alt. 9 m; 18 Nov. 2017; M.R. Sharaf leg.; CASENT0922866; CASC.

#### **Ecological and biological notes**

Several workers were found on a small shrub near a settlement where the area was contaminated by human waste. In Ayn Hamran, workers were foraging in leaf litter under a tree of *Ziziphus* sp. (Rhamnaceae Juss.). This species commonly builds nests in soil, rotten wood, under bark, inside plant cavities, or in decaying organic matter (Vail *et al.* 1994). Colonies vary from 100–1000 individuals, and are often polygynous (Harada 1990). The nesting sites in urban localities are diverse including potted plants, breadboxes, shower curtain rods, behind baseboards, inside clothing irons, between books, inside pool enclosures, in kitchens, and in hospitals (Klotz *et al.* 2008).

#### **Geographic range**

This is a successful invasive species originally described from French Guiana that has spread worldwide (Wetterer 2009). It is known from several countries in the Arabian Peninsula, including Oman, Kingdom of Saudi Arabia (KSA) (Collingwood 1985), Yemen (Collingwood & Agosti 1996), the United Arab Emirates (UAE) (Collingwood *et al.* 1997), and the Socotra Archipelago (Collingwood *et al.* 2004; Sharaf *et al.* 2017c). This species is reported here for the first time in Dhofar.

Subfamily Formicinae Latreille, 1809

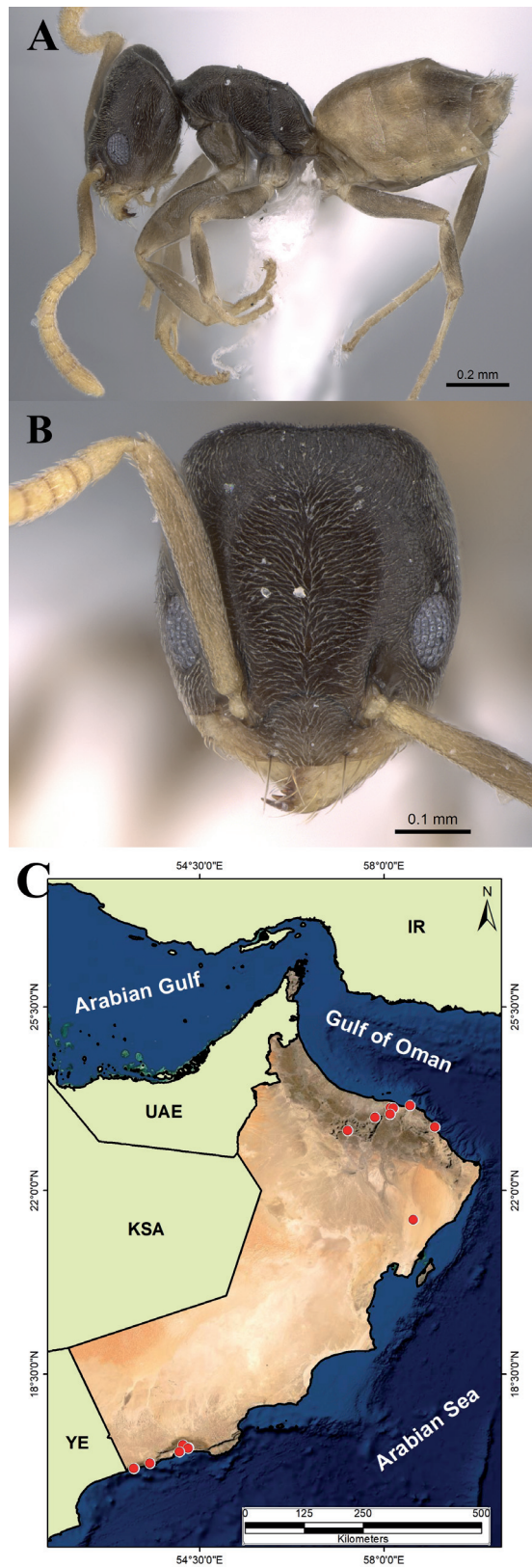
Genus *Camponotus* Mayr, 1861

*Camponotus aegyptiacus* Emery, 1915

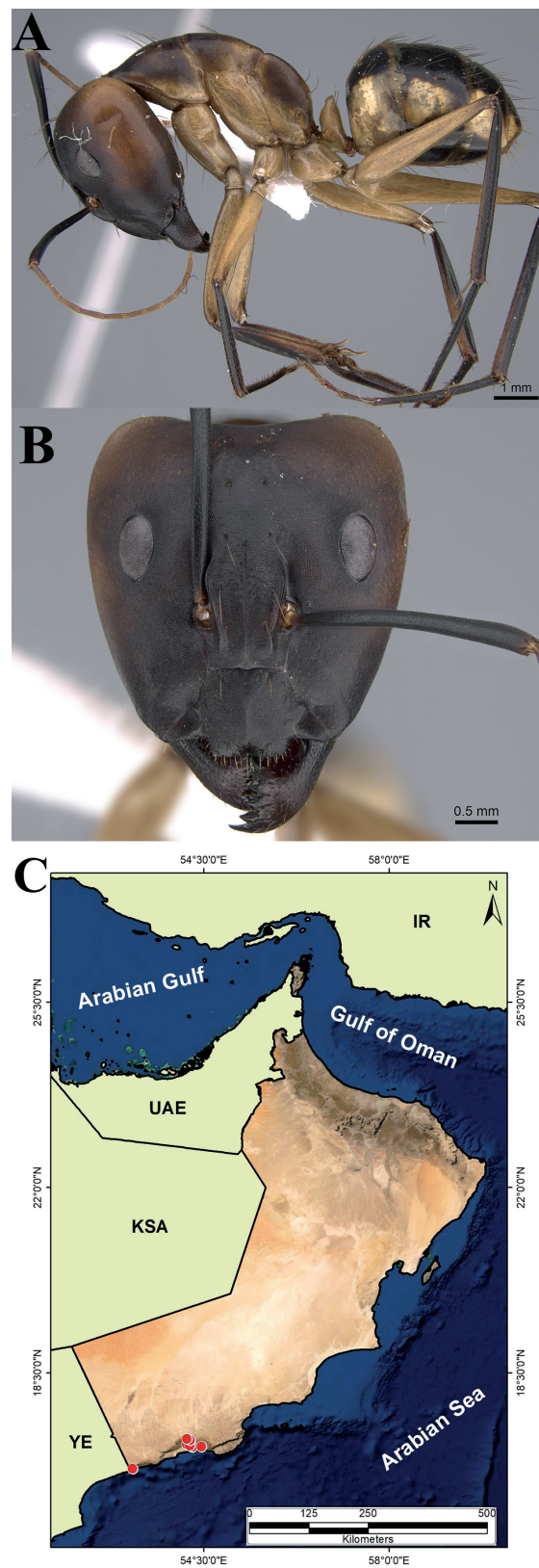
Figs 3–4

*Camponotus maculatus* subsp. *aegyptiacus* Emery, 1915a: 79 (w) Egypt. Palearctic.





**Fig. 2.** *Tapinoma melanocephalum* (Fabricius, 1793), worker (CASENT0922866, AntWeb.org (Michele Esposito)). A. Body in profile. B. Head in full-face view. C. Distribution map.



**Fig. 3.** *Camponotus aegyptiacus* Emery, 1915, major worker (CASENT0922849, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

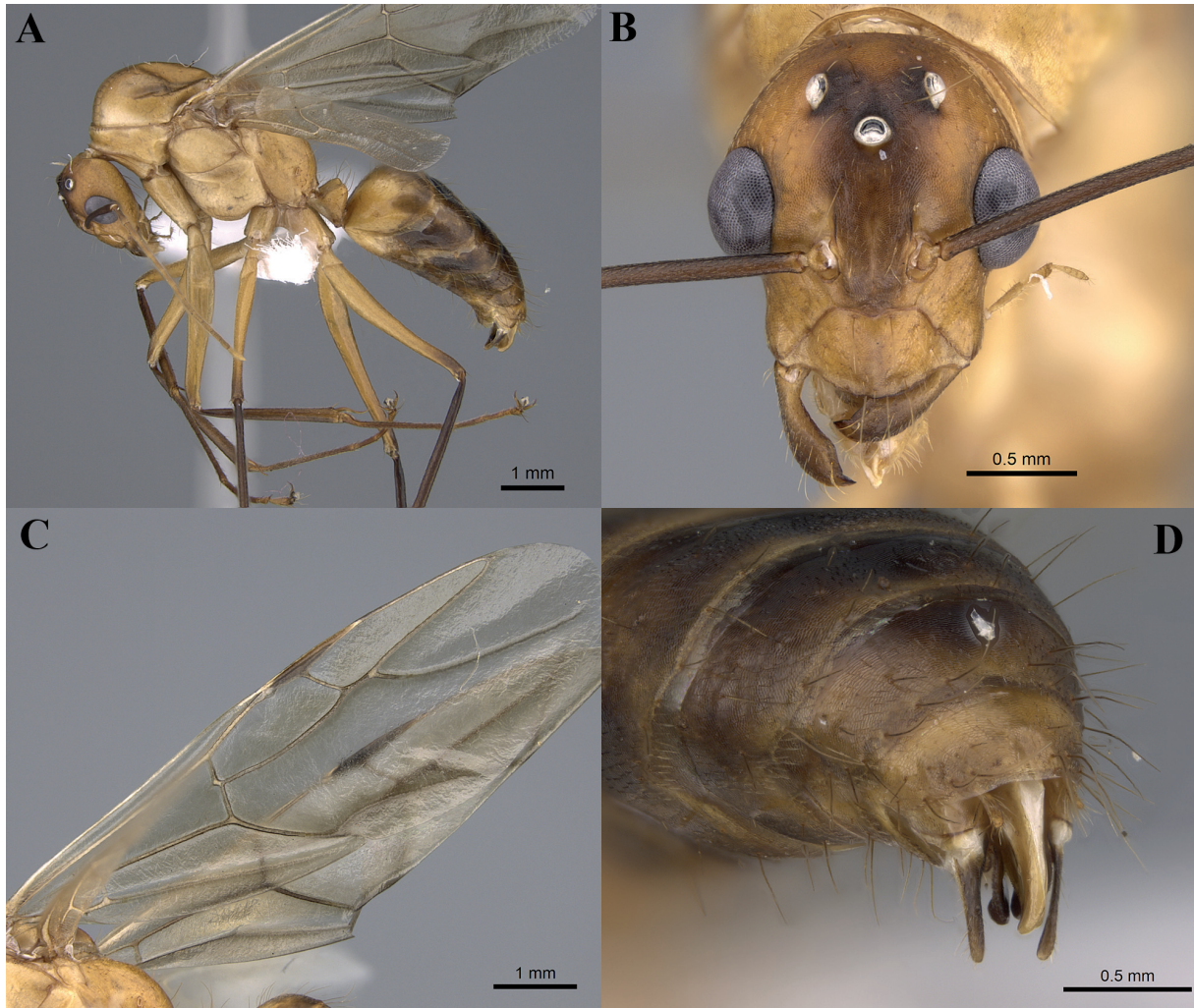


### Diagnosis

Among the Arabian members of the genus this species is readily recognized by the presence of three yellow merged blotches on each side of gaster; subcephalic setae present but not numerous.

### Material examined

OMAN – Dhofar • 13 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; ML; M.R. Sharaf leg.; KSMA • 6 w; Salalah; 17.152° N, 54.219° E; alt. 435 m; 22 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 2 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 4 w; Ayn Sahlanot; 17.147° N, 54.180° E; alt. 134 m; 16 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 3 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 8 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; HP; M.R. Sharaf leg.; KSMA.



**Fig. 4.** *Camponotus aegyptiacus* Emery, 1915, ♂ (CASENT0922850, AntWeb.org (Michele Esposito)). A. Body in profile. B. Head in full-face view. C. Wing. D. Genitalia.

### Ecological and biological notes

*Camponotus aegyptiacus* was found nesting under a rock where the soil was rocky, and the nest included a chamber inhabited by silverfish (*Thysanura* Leach, 1815). Several workers were foraging in a dry leaf litter under a tree of *Prosopis* L. (Fabaceae Lindl.). Other workers were ascending trees and shrubs and were collected using a beating sheet.

### Geographic range

*Camponotus aegyptiacus* was described from Egypt and recorded from KSA, Kuwait, Oman, and Yemen (Collingwood & Agosti 1996), and Egypt (Sharaf 2006).

### *Camponotus arabicus* Collingwood, 1985

Fig. 5

*Camponotus arabicus* Collingwood, 1985: 278 (w, q) Saudi Arabia. Afrotropic.

### Diagnosis

In his original description, Collingwood (1985) pointed out that *C. arabicus* closely resembles *C. alii* Forel, 1890 but it can be separated by the abundant subcephalic setae and the more sculptured gaster.

### Material examined

This species was not collected during the present study.

### Ecological and biological notes

Nothing has been published on the ecology of this species.

### Geographic range

A species originally known from KSA and Oman (Collingwood 1985), and recorded from Yemen (Collingwood & Agosti 1996). This species was recorded from Dhofar by Collingwood (1985) based on two workers.

### *Camponotus diplopunctatus* Emery, 1915

Fig. 6

*Camponotus diplopunctatus* Emery, 1915b: 22 (w, q) Ethiopia. Afrotropic.

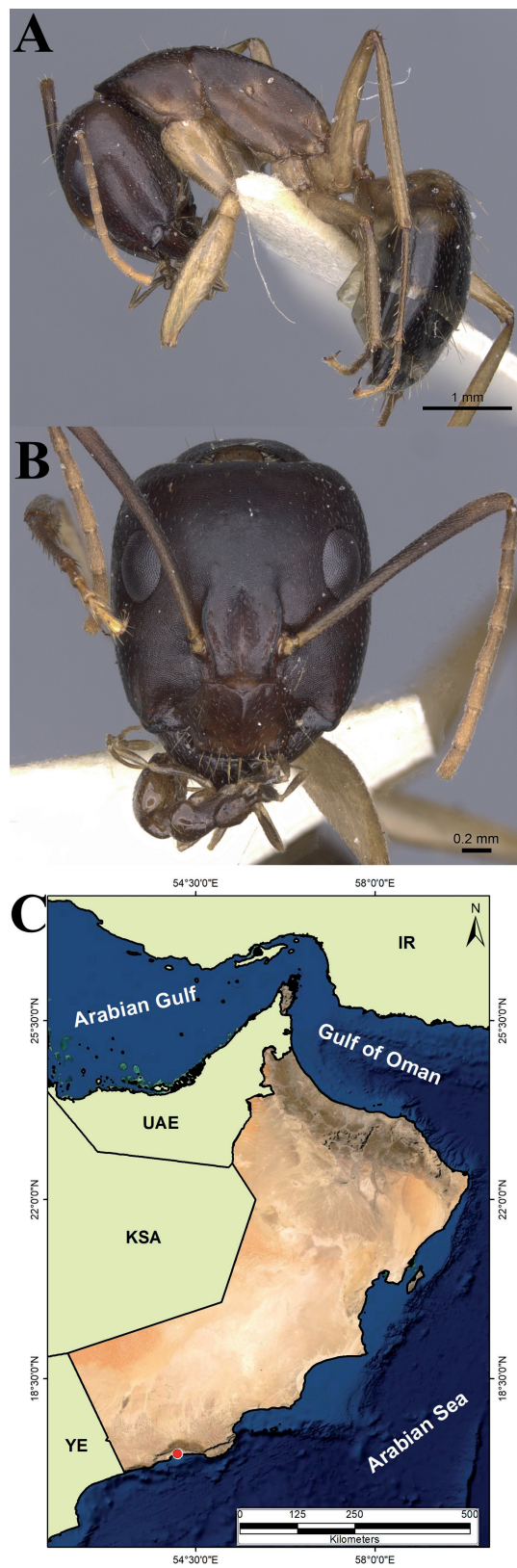
### Diagnosis

Mesosoma in profile with promesonotum and mesonotum making a continuous curve descending posteriorly to a deep metanotal groove; propodeum in profile with dorsum making a rounded arch with declivity; head, propodeum, petiole, and gastral tergites with sparse stiff long setae.

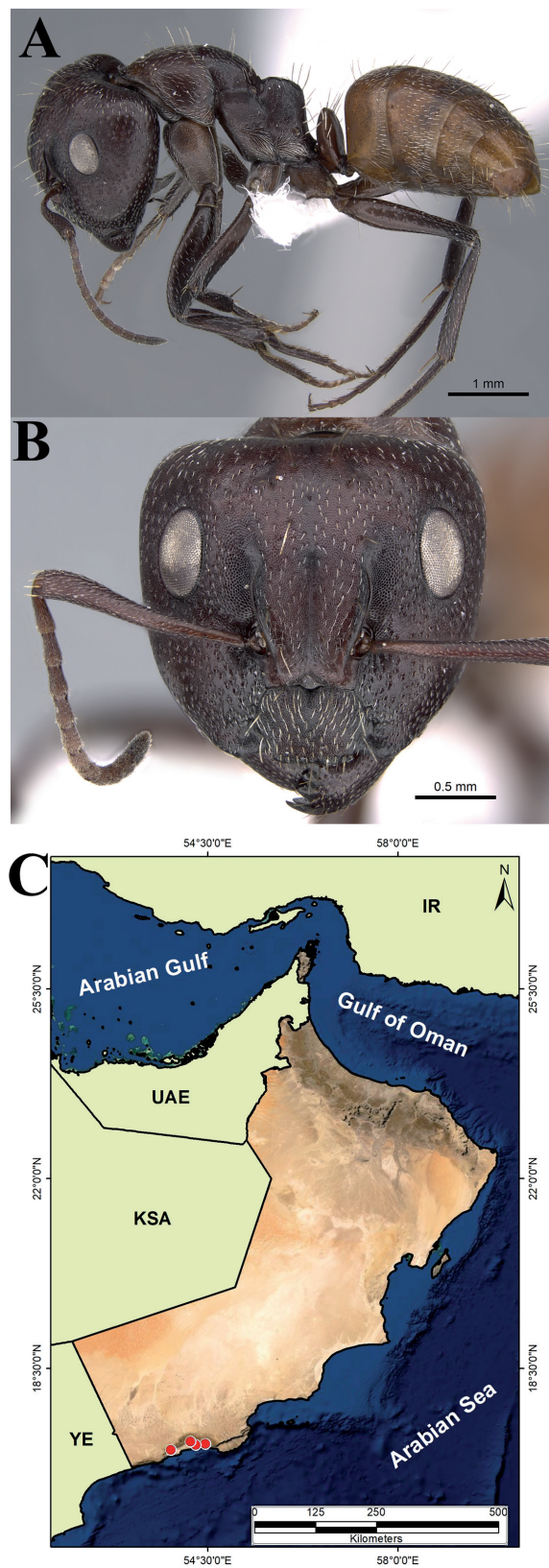
### Material examined

OMAN – Dhofar • 12 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 s; same collection data as for preceding; CASENT0922847; CASC • 2 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 3 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 3 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; Ayn Sahlanot; 17.147° N, 54.180° E; alt. 134 m; 16 Nov. 2017; HP; M.R. Sharaf leg.; KSMA.





**Fig. 5.** *Camponotus arabicus* Collingwood, 1985, paratype, major worker (CASENT0911902, AntWeb.org (Will Ericson)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 6.** *Camponotus diplopunctatus* Emery, 1915, major worker (CASENT0922847, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Ecological and biological notes

This species was observed ascending the trunk of a tree of *Vachellia* Wight & Arn. (Fabaceae).

### Geographic range

This species was described from Ethiopia and has been recorded from Eritrea and Sudan (AntWeb 2022). Although our collected major worker is ~20% larger, and perhaps darker, than the type major worker, the identification seems secure. This species is a new record for Dhofar and Oman.

### *Camponotus flavomarginatus* Mayr, 1862

Fig. 7

*Camponotus flavomarginatus* Mayr, 1862: 664 (w) Ghana. Afrotropic.

*Camponotus jizani* Collingwood, 1985: 281 (w) Saudi Arabia. Afrotropic, [holotype and paratype examined], **syn. nov.**

### Diagnosis

Mesosomal profile a continuous curve; metanotal groove indistinct; petiole in profile with a curved anterior margin and a straight posterior margin; entire surface covered with dense pale pubescence; few sparse setae on body.

### Material examined

OMAN – Dhofar • 3 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 5 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; HP, ML; M.R. Sharaf leg.; KSMA • 9 w; Ayn Sahlanot; 17.147° N, 54.180° E; alt. 134 m; 16 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 3 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 s; same collection data as for preceding; CASENT0922854; CASC • 10 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922855; CASC • 2 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA.

### Holotype of *Camponotus jizani*

KINGDOM OF SAUDI ARABIA • 1 s; Fifa; no date; C.A. Collingwood leg.; CASENT0922313; WMLC.

### Paratype of *Camponotus jizani*

KINGDOM OF SAUDI ARABIA • 1 mw; Fifa nr Jizan; 27–31 Mar. 1983; C.A. Collingwood leg.; CASENT0911619; NHMB.

### Ecological and biological notes

A nest series was found under a stone where the soil was loose and dry. Several workers were found on a tree of *Vachellia*.

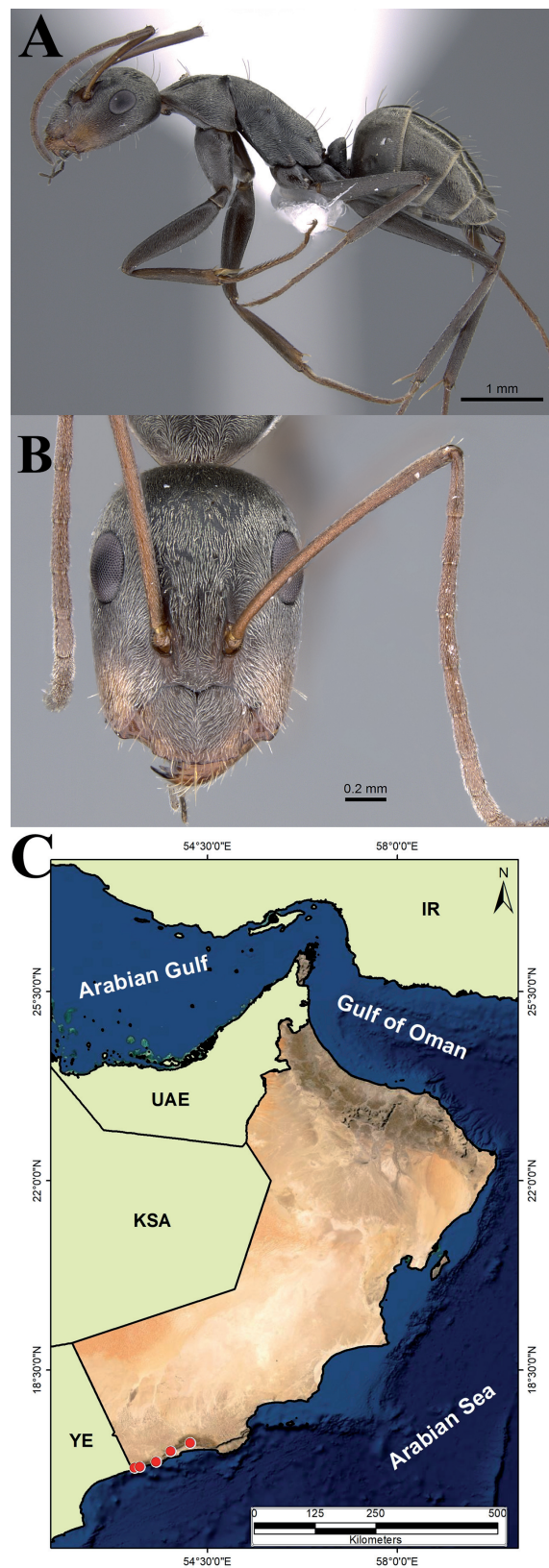
### Geographic range

An Afrotropical species originally described from Ghana and recorded from the Asir Mountains (KSA) (Collingwood 1985), Oman, Yemen (Collingwood & Agosti 1996), and the UAE (Collingwood *et al.* 1997). *Camponotus flavomarginatus* is reported here for the first time in Dhofar.

### Remarks

The type material of *Camponotus jizani* is represented by only two specimens, a paratype minor worker (CASENT0911619) that is deposited in NHMB, and a presumably holotype major worker (CASENT0922313) deposited in WMLC. Unfortunately, the card of the holotype specimen is cut and





**Fig. 7.** *Camponotus flavomarginatus* Mayr, 1862, major worker (CASENT0922854, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



the data do not completely match the data mentioned in the original description except for the type locality (Fifa). In a discussion between M.R. Sharaf and C.A. Collingwood, the latter confirmed that these two specimens represent the type material of *C. jizani*. A comparison of the available holotype and paratype workers of *C. jizani* with the type material of *C. flavomarginatus* was carried out. We here treat *C. jizani* as a junior subjective synonym of *C. flavomarginatus*. Numerous species similar to *C. flavomarginatus* exist in the Afrotropical Region. There is a large complex of species centered around *C. rufoglaucus* (Jerdon, 1851), first described from India, and *C. flavomarginatus*. The complex comprises many broadly distributed species with numerous infraspecific taxa of dubious identity, and poorly preserved type material. Thus, the identification of this species complex as *C. flavomarginatus* is questionable.

***Camponotus sericeus*** (Fabricius, 1798)

Fig. 8

*Formica sericea* Fabricius, 1798: 279 (w) Senegal. Afrotropic.

**Diagnosis**

Body dull, coarsely sculptured with sparse stiff setae; propodeum broadly dentate posteriorly; mesosoma in profile with a deep metanotal groove; gaster covered with dense, appressed, golden pubescence.

**Material examined**

This species was not collected during the present study.

**Ecological and biological notes**

This species often nests in soil under stones adjacent to *Acacia* trees in Arabian deserts.

**Geographic range**

This is a common and widespread African species, originally described from Senegal, but is widely distributed in the Arabian Peninsula including Oman, Kuwait, KSA, Yemen (Collingwood 1985; Collingwood & Agosti 1996; Sharaf *et al.* 2013), and UAE (Collingwood *et al.* 2011). *Camponotus sericeus* is also known from Israel (Ionescu-Hirsch 2009), Afghanistan (Radchenko 1997), and India (Dey & Coumar 2008). This species was previously recorded from Dhofar based on a single specimen identified by Collingwood (1985).

Genus ***Cataglyphis*** Foerster, 1850

***Cataglyphis adenensis*** (Forel, 1904)

Fig. 9

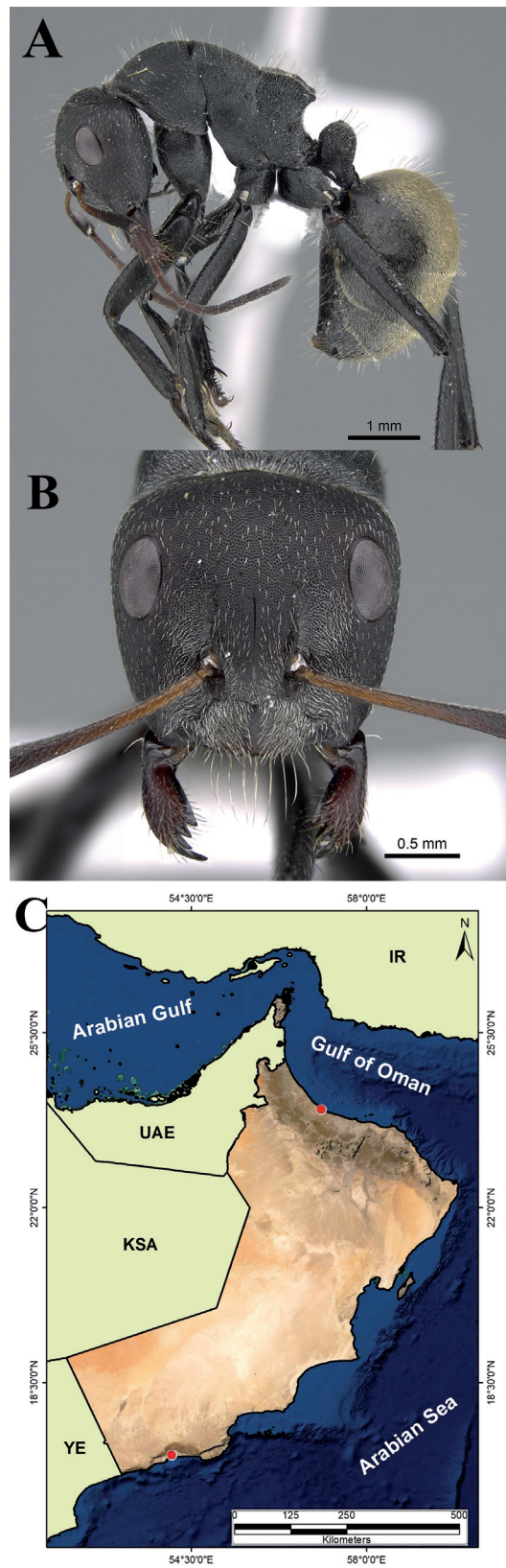
*Myrmecocystus viaticus* r. *adenensis* Forel, 1904: 382 (footnote) (w) Yemen. Afrotropic.

**Diagnosis**

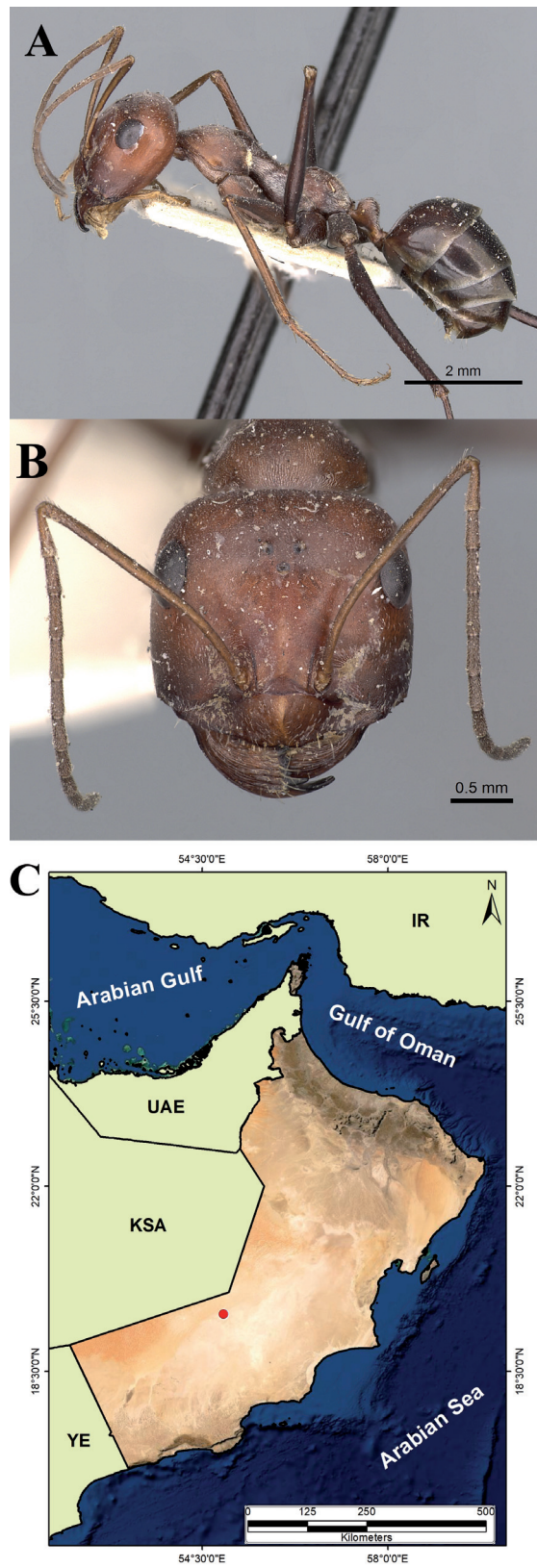
Bicolored species with head and mesosoma red or dull brown-red, gaster brown; head slightly longer than broad; petiole in profile with a rounded dome; mesosoma and petiole covered with whitish appressed pubescence.

**Material examined**

This species was not collected during the present study.

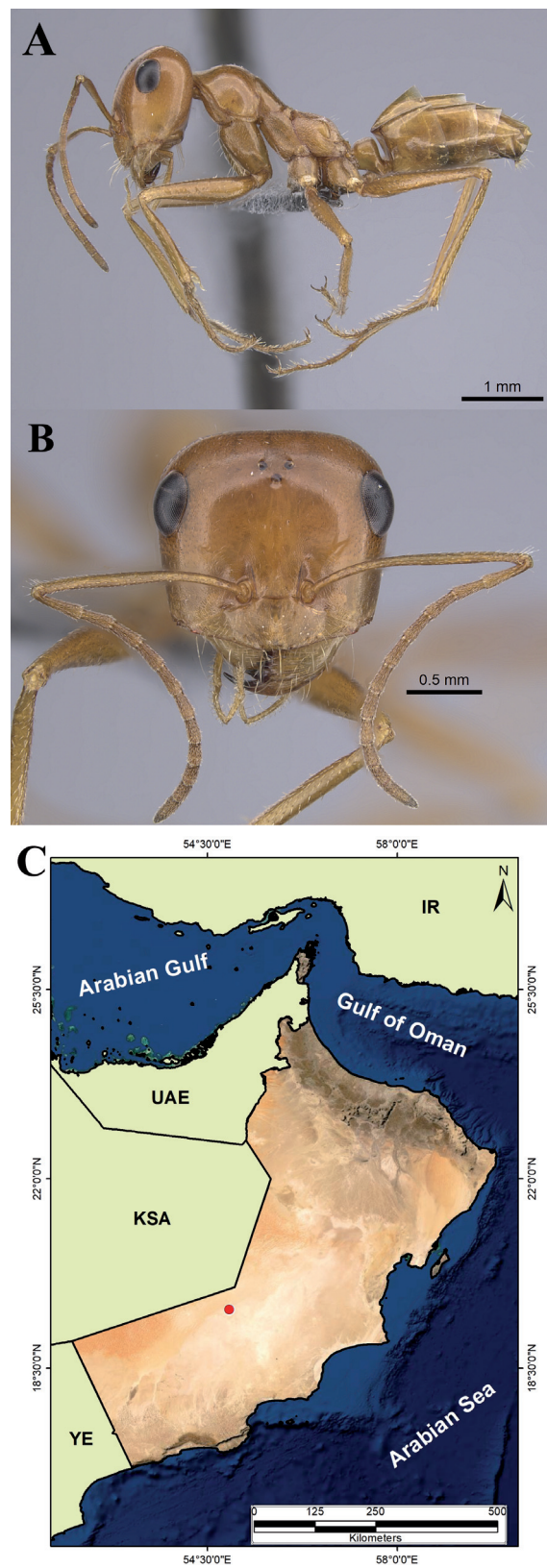


**Fig. 8.** *Camponotus sericeus* (Fabricius, 1798), major worker (CASENT0922266, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 9.** *Cataglyphis adenensis* (Forel 1904), syntype, worker (CASENT0249890, AntWeb.org (Shannon Hartman)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 10.** *Cataglyphis arenaria* Finzi, 1940, worker (CASENT0263825, AntWeb.org (Will Ericson)).  
A. Body in profile. B. Head in full-face view. C. Distribution map.



**Ecological and biological notes**

Nothing is known on the ecology or biology of this species.

**Geographic range**

A species was originally described from Yemen and subsequently recorded from Oman (Collingwood & Agosti 1996), Kuwait, and UAE (Collingwood *et al.* 2011). A single worker was collected from Dhofar by Collingwood & Agosti (1996).

*Cataglyphis arenaria* Finzi, 1940

Fig. 10

*Cataglyphis (Cataglyphis) albicans* var. *arenaria* Finzi, 1940: 164 (w) Algeria. Palearctic.

**Diagnosis**

Body color yellow, gaster frequently with a dark apex; propodeal dorsum low in profile; mesosoma bare except for few pairs of short setae on propodeum; mesosoma, posterior part of head and coxae covered with a layer of silvery appressed pubescence.

**Material examined**

This species was not collected during the present study.

**Ecological and biological notes**

Nothing has been published on the ecology of this species.

**Geographic range**

*Cataglyphis arenaria* was originally described from Algeria and has been recorded from Oman (Collingwood & Agosti 1996), and UAE (Collingwood *et al.* 2011). Collingwood & Agosti (1996) reported this species from Dhofar based on two workers.

*Cataglyphis isis* (Forel, 1913)

Fig. 11

*Myrmecocystus (Cataglyphis) diehlii* var. *isis* Forel, 1913: 434 (w) Egypt. Palearctic.

**Diagnosis**

Body color black; first funicular segment less than  $1.4\times$  as long as second; propodeal dorsum in profile low; mesosoma and petiole with dense whitish appressed pubescence; petiolar node higher than long in profile; gaster slightly sculptured and dull.

**Material examined**

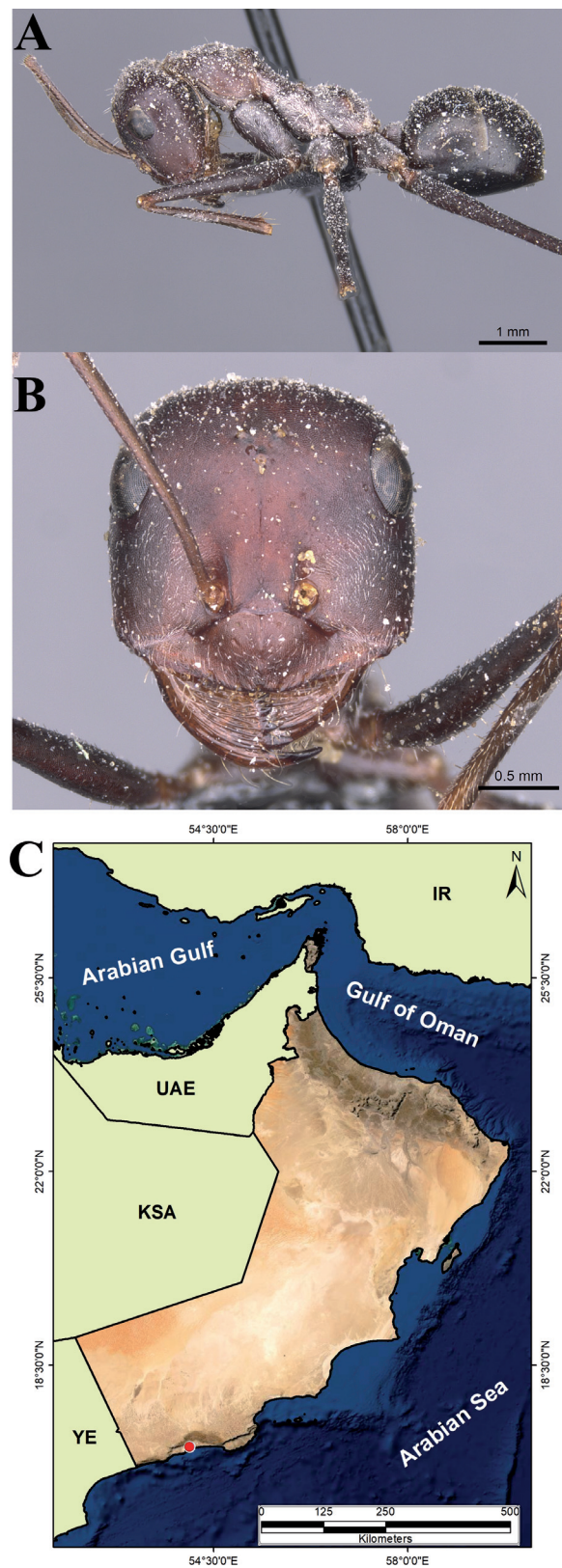
This species was not collected during the present study.

**Ecological and biological notes**

Nothing has been published on the ecology of this species.

**Geographic range**

A species originally described from Egypt and recorded from several countries in the Middle East including Oman, KSA (Collingwood 1985), UAE, Yemen (Collingwood & Agosti 1996; Collingwood



**Fig. 11.** *Cataglyphis isis* (Forel, 1913), syntype, worker (CASENT0912205, AntWeb.org (Will Ericson)).  
A. Body in profile. B. Head in full-face view. C. Distribution map.

*et al.* 2011), Israel (Ionescu & Eyer 2016), Afghanistan, Iraq, and Iran (Pisarski 1965). *Cataglyphis isis* was recorded from Dhofar (Collingwood & Agosti 1996) based on two worker specimens.

***Cataglyphis rubra*** (Forel, 1903)

Fig. 12

*Myrmecocystus albicans* r. *ruber* Forel, 1903: 268 (w) Algeria. Palearctic.

**Diagnosis**

Head, mesosoma, petiole red, gaster brown; posterior margin of head with 6–10 straight, erect setae; petiole in profile low, with a flat dorsal surface sloping forward, in profile with node longer than high; propodeal dorsum making a blunt obtuse angle with declivity; mesosoma and petiole with pale appressed pubescence.

**Material examined**

This species was not collected during the present study.

**Ecological and biological notes**

Noted as a desert species by Moradloo *et al.* (2015).

**Geographic range**

*Cataglyphis rubra* was originally described from Algeria and is widely distributed throughout North Africa from the Atlas Mountains to Sinai Peninsula (Collingwood 1985; Collingwood & Agosti 1996). It is also recorded from Oman (Collingwood 1985), and UAE (Collingwood *et al.* 2011). This species has been recorded from Dhofar by Collingwood (1985).

***Cataglyphis sabulosa*** Kugler, 1981

Fig. 13

*Cataglyphis sabulosa* Kugler, 1981: 84 (w, q, m) Israel. Palearctic.

**Diagnosis**

Color yellow to orange-brown; gaster frequently brown; first funicular segment nearly 1.5× as long as second; propodeal dorsum passing in a curve into equally long declivity; petiole squamiform, convex anteriorly and straight posteriorly; third maxillary palp fringed with long curved setae; head, mesosoma, petiole, gaster, and coxae usually with dense white-silvery pubescence.

**Material examined**

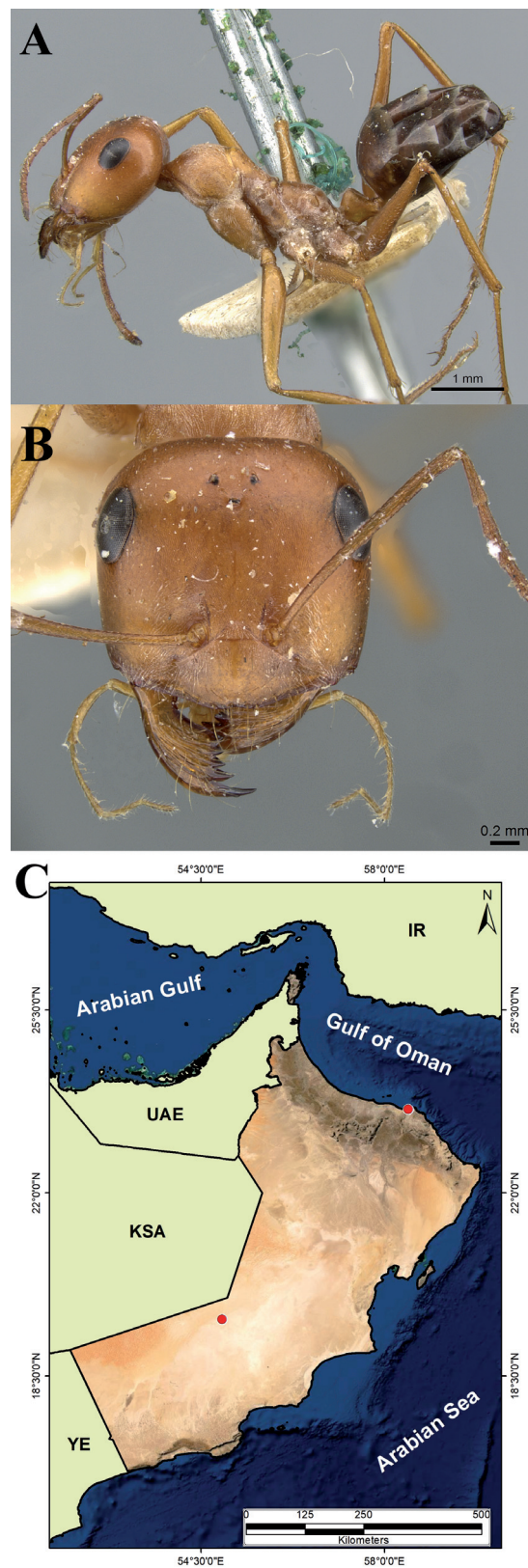
This species was not collected during the present study.

**Ecological and biological notes**

*Cataglyphis sabulosa* is a desert species that builds nests in the sand at a depth of about 20 cm, where alate males and dealate queens occur (Kugler 1981). The species seems to be a preferred diet of the lizard, *Acanthodactylus schreiberi* Boulenger, 1878 (Lacertidae).

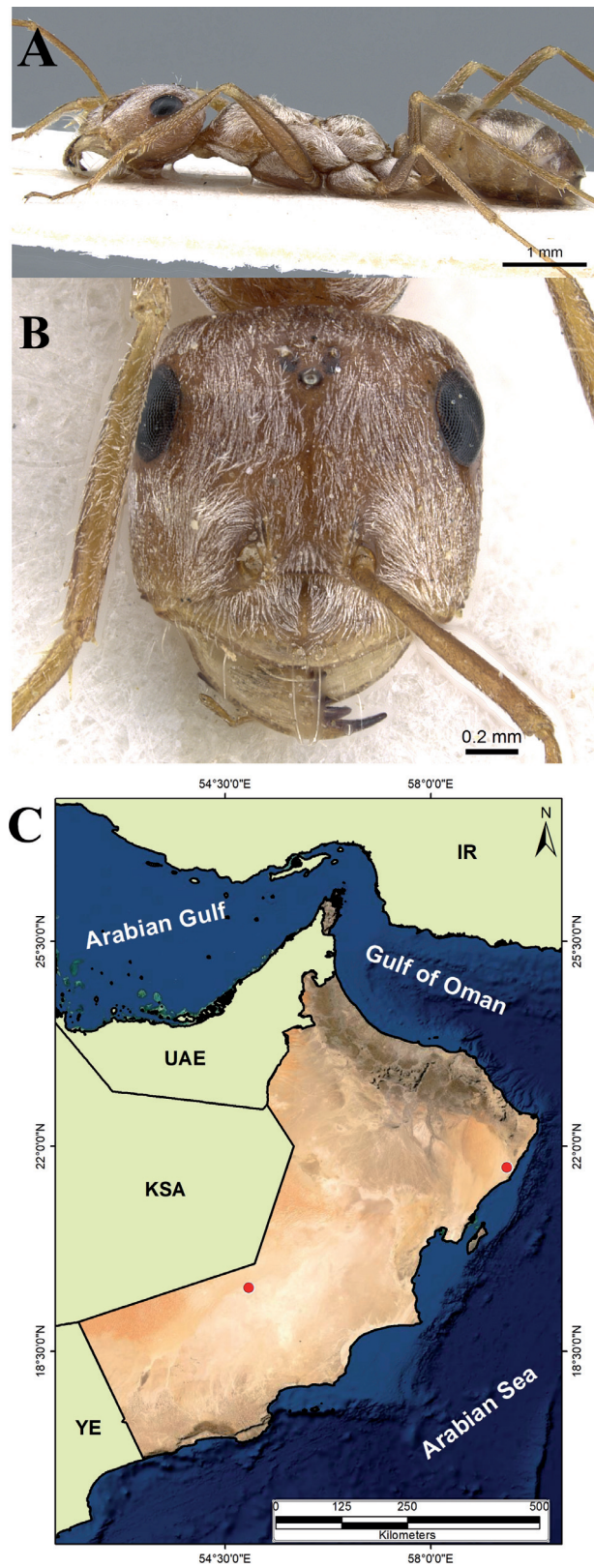
**Geographic range**

A species originally described from Israel and recorded from Egypt (Kugler 1981), Oman, KSA (Collingwood 1985), UAE, and Yemen (Collingwood & Agosti 1996). Collingwood (1985) recorded this species from Dhofar based on a single worker.

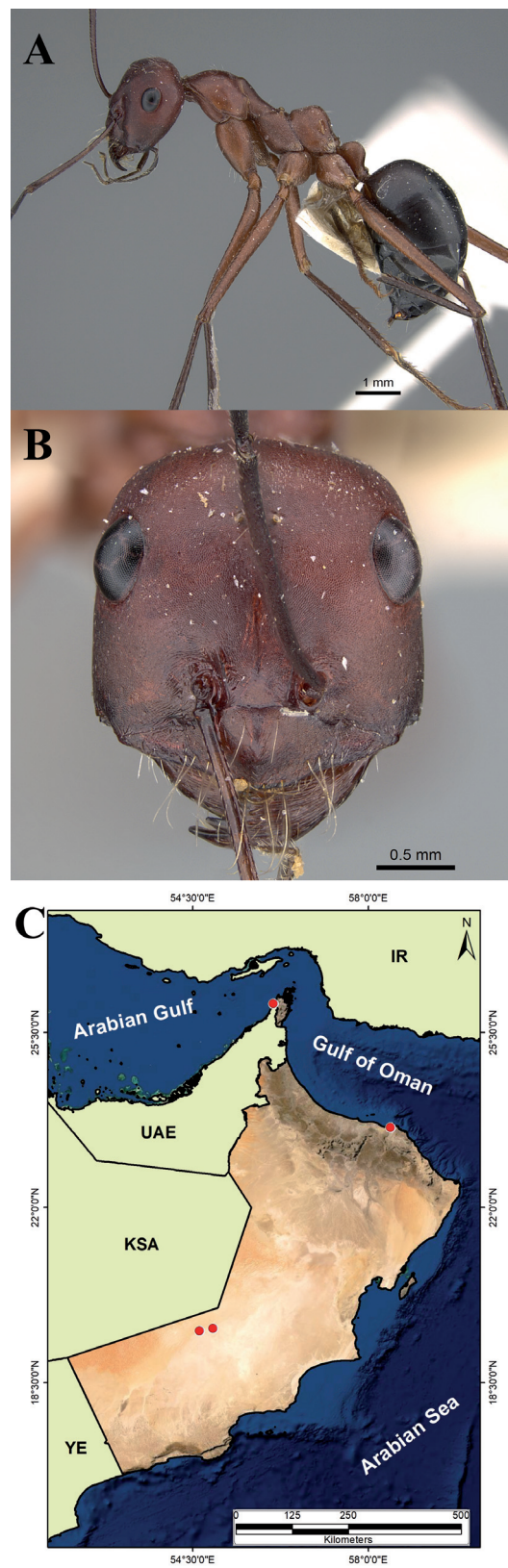


**Fig. 12.** *Cataglyphis rubra* (Forel, 1903), syntype, worker (CASENT0911102, AntWeb.org (Zach Lieberman)). A. Body in profile. B. Head in full-face view. C. Distribution map.





**Fig. 13.** *Cataglyphis sabulosa* Kugler, 1981, paratype, worker (CASENT0903289, AntWeb.org (Alexandra Westrich)). A. Body in profile. B. Head in full-face view. C. Distribution map.



**Fig. 14.** *Cataglyphis urens* Collingwood, 1985, syntype, worker (CASENT0922340, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

*Cataglyphis urens* Collingwood, 1985

Fig. 14

*Cataglyphis urens* Collingwood, 1985: 290 (w, m) Oman. Palearctic.

**Diagnosis**

Head and mesosoma dark red, gaster dark brown to black; appendages brown-red; propodeum in profile with a high dorsum meeting declivity in a rounded right angle; petiole lower, clearly longer than high in profile; several pairs of sparse setae on cephalic dorsum, promesonotum, propodeum, petiole, and gastral tergites.

**Material examined**

This species was not collected during the present study.

**Ecological and biological notes**

Nothing has been published on the ecology of this species.

**Geographic range**

This species was originally described from Dhofar, Oman (Collingwood 1985) based on a single worker, and also recorded from KSA, UAE, and Yemen (Collingwood & Agosti 1996).

Genus *Lepisiota* Santschi, 1926

*Lepisiota canescens* (Emery, 1897)

Fig. 15

*Acantholepis capensis* var. *canescens* Emery, 1897: 601 (w) Somalia. Afrotropic.

**Diagnosis**

Body entirely black; general appearance moderately shining; pilosity long and abundant, especially on gaster; pronotum with five pairs of setae; whole body smooth except mesopleura transversely striate.

**Material examined**

OMAN – Dhofar • 6 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 9 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; Dhalkout; 16.727° N, 53.249° E; alt. 623 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922846; CASC.

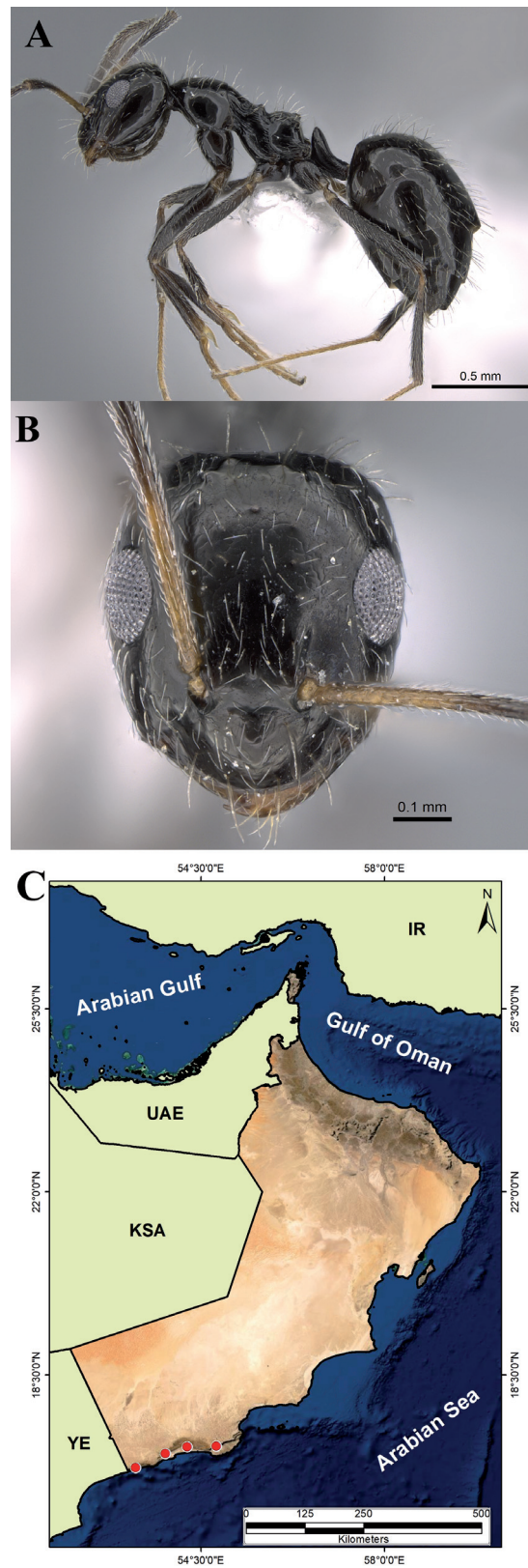
**Ecological and biological notes**

This species was collected from a small tree of *Vachellia* using a beating sheet, whereas several individuals were found in leaf litter under another tree of *Vachellia* where the soil was dry.

**Geographic range**

This species was originally described from Somalia and was subsequently recorded from Oman and Yemen (Collingwood & Agosti 1996), and KSA (Collingwood 1985). It has also been reported from Israel (Vonshak & Ionescu-Hirsch 2009) and Ethiopia (Sorger *et al.* 2017). Our records indicate that this species is relatively widely distributed in the southwestern mountains of the KSA where trees of *Vachellia* are abundant. This species has invaded a wide range of environments in Ethiopia and has the potential to become invasive affecting native species (Sorger *et al.* 2017). This species is reported for the first time in Dhofar.





**Fig. 15.** *Lepisiota canescens* (Emery, 1897), worker (CASENT0922846, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Remarks

There are several infraspecific taxa of dubious identity originally described as varieties of *Lepisiota capensis* (Mayr, 1862), mostly known from the Afrotropical Region (Bolton 1995). The taxonomy of this group of species is poorly understood with numerous possible synonymies and other taxonomic amendment. This situation leads to difficulties in identification and uncertainty of species delimitations, but Taylor (2019) has sought to provide some clarification.

### *Lepisiota carbonaria* (Emery, 1892)

Fig. 16

*Acantholepis carbonaria* Emery, 1892: 119 (w, q) Somalia. Afrotropic.

### Diagnosis

Smaller species (TL 2.12); color dark brown, antennae, tibiae, and tarsi yellowish; propodeal spines short and blunt; head and mesosoma strongly sculptured, completely opaque; head in full-face view with posterior margin without setae; mesosoma without setae.

### Material examined

OMAN – Dhofar • 4 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

This species was found in leaf litter under a tree of *Vachellia* where the soil was dry.

### Geographic range

This species was originally described from Somalia and has been recorded from Oman by Collingwood & Agosti (1996). This species is a new record for Dhofar.

### *Lepisiota dhofara* Collingwood & Agosti, 1996

Fig. 17

*Lepisiota dhofara* Collingwood & Agosti, 1996: 366 (w) Oman. Afrotropic.

### Diagnosis

Color dark brown, appendages pale; propodeal spines long and curved; head and mesosoma densely sculptured and completely opaque; first and second gastral tergites with a few pairs of long setae located at posterior margins of tergites.

### Material examined

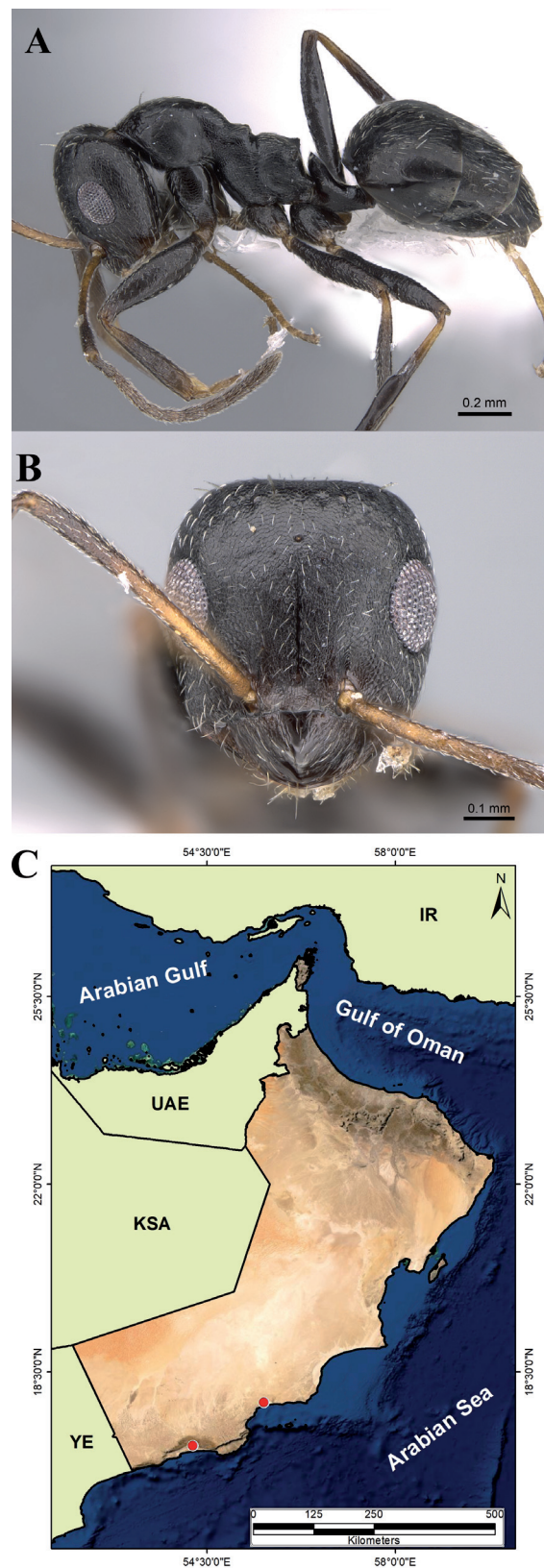
OMAN • 1 w (without antennae); unknown locality (supposedly Dhofar Governorate); specimen code 39; C.A. Collingwood leg.; CASENT0906340; WMLC.

### Ecological and biological notes

Nothing has been published on ecology of this species.

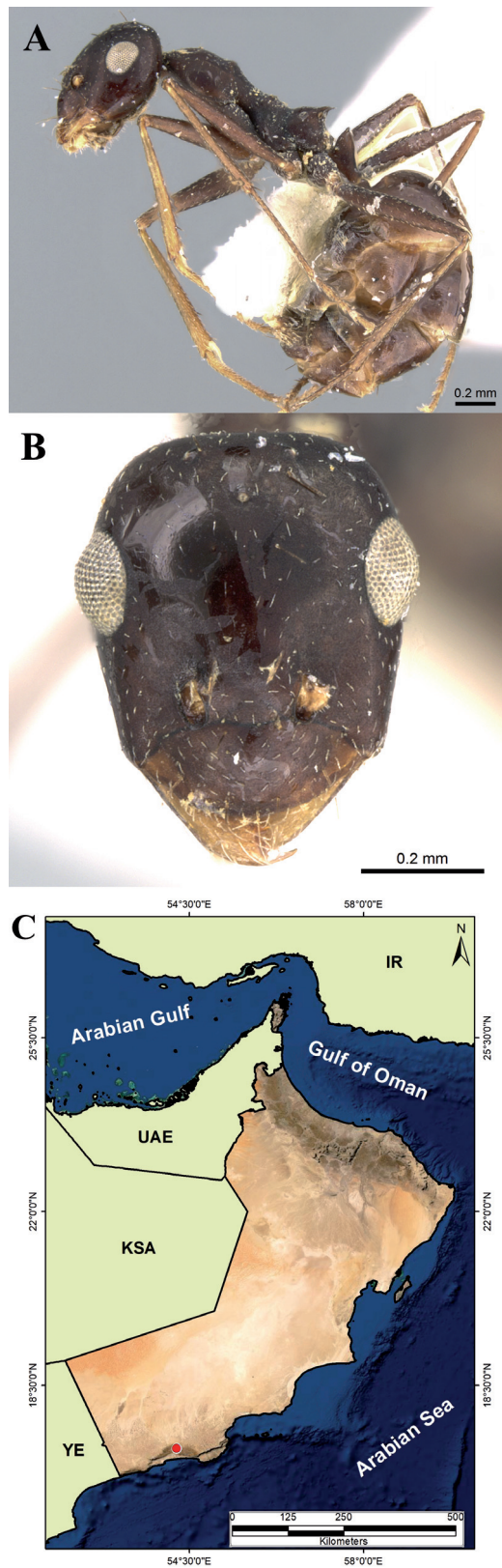
### Geographic range

*Lepisiota dhofara* was described from Dhofar Governorate and is apparently endemic to Oman.

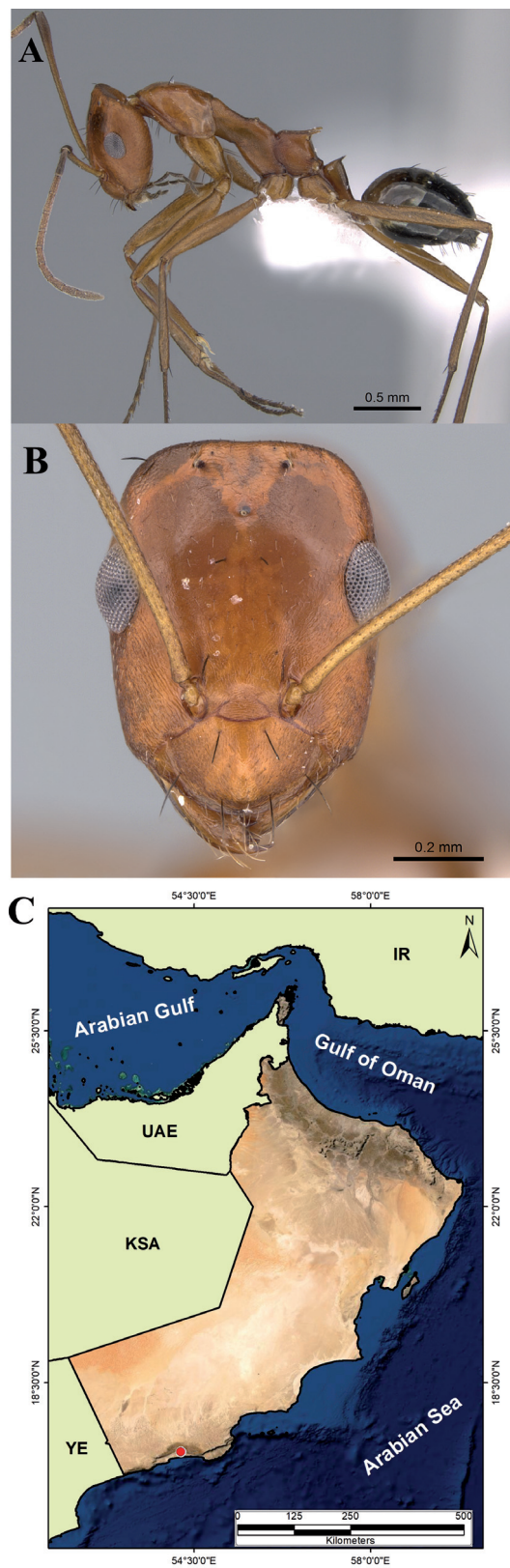


**Fig. 16.** *Lepisiota carbonaria* (Emery, 1892), worker (CASENT0922845, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 17.** *Lepisiota dhofara* Collingwood & Agosti, 1996, paratype, worker (CASENT0906340, AntWeb.org (Estella Ortega)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 18.** *Lepisiota elbazi* Sharaf & Hita Garcia, 2020, paratype, worker (CASENT0922860, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

*Lepisiota elbazi* Sharaf & Hita Garcia, 2020

Fig. 18

*Lepisiota elbazi* Sharaf & Hita Garcia, 2020 in Sharaf *et al.* 2020: 134 (w) Afrotropic.

**Diagnosis**

Bicolored species, head, mesosoma, petiole yellow or red-yellow, distal end of scapes, first funicular segment, and mandibular teeth darker; gaster dark brown to black with first tergite of lighter brown. In profile, posterior margin of head anteroposteriorly compressed; limited number of hair pairs on body: two pairs on posterior margin of head, two to three pairs on promesonotum, and one to two pairs on first gastral tergite.

**Material examined**

OMAN – Dhofar • w, holotype; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w, paratype; same collection data as for holotype; CASENT0922860; KSMA.

**Ecological and biological notes**

The two workers of the species were collected at Ayn Razat (Fig. 18) and were collected foraging in leaf litter under a tree of *Vachellia* where the soil was dry (Sharaf *et al.* 2020a).

**Geographic range**

Oman.

*Lepisiota obtusa* (Emery, 1901)

Fig. 19

*Acantholepis carbonaria* var. *obtusa* Emery, 1901: 63 (w) Ethiopia. Afrotropic.

**Diagnosis**

Color dark brown or black; appendages paler; propodeal spines reduced or indistinct; petiole in profile with a slightly convex anterior face and a straight posterior face; whole mesosomal and gastral dorsum covered with abundant pale setae.

**Material examined**

OMAN – Dhofar • 8 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922844; CASC.

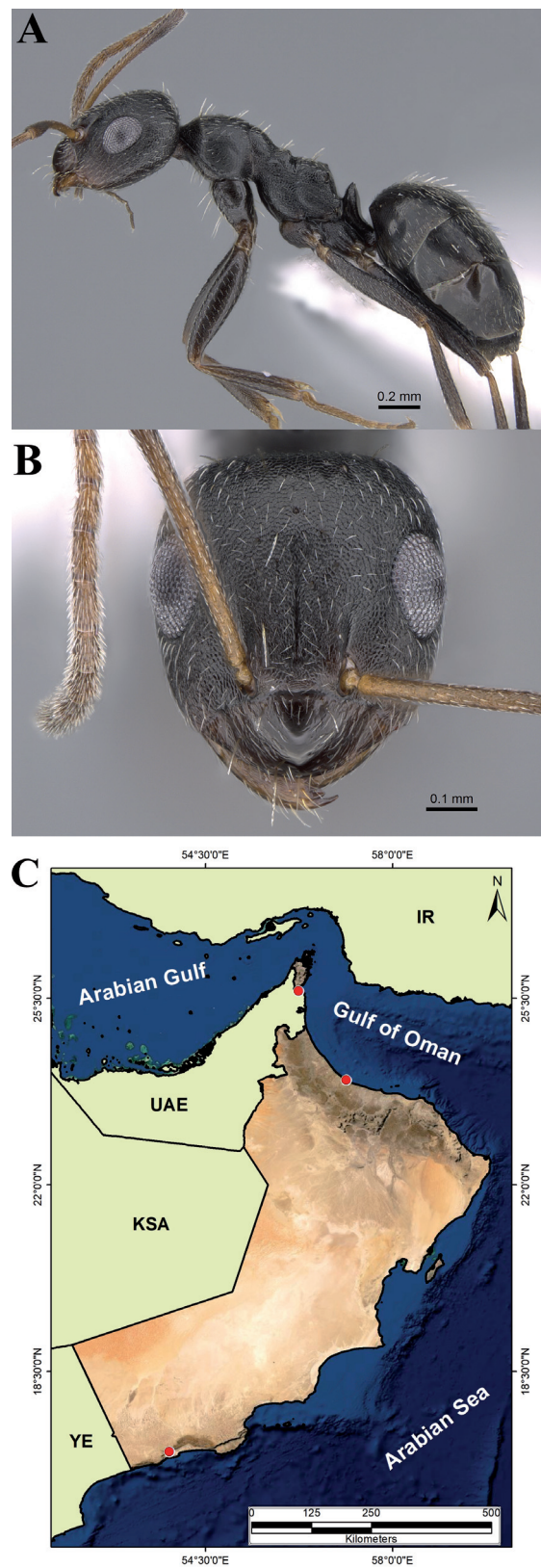
**Ecological and biological notes**

This species was nesting under a rock next to a tree of *Vachellia*.

**Geographic range**

This species was originally described from Ethiopia and has been recorded from North Africa, KSA (Collingwood 1985), Oman, and Yemen (Collingwood & Agosti 1996). *Lepisiota obtusa* is reported here for the first time in Dhofar.





**Fig. 19.** *Lepisiota obtusa* (Emery, 1901), worker (CASENT0922844, AntWeb.org (Michele Esposito)).  
A. Body in profile. B. Head in full-face view. C. Distribution map.

*Lepisiota opaciventris* (Finzi, 1936)

Fig. 20

*Acantholepis frauenfeldi* var. *opaciventris* Finzi, 1936: 187 (w) Egypt. Palearctic.

**Diagnosis**

Color entirely black, antennae, tibiae, and tarsi paler; propodeum and first gastral tergite with some fine surface sculpture; mesosoma brilliant; first gastral tergite with characteristic violet reflection; cephalic and gastral surfaces dull.

**Material examined**

OMAN – **Dhofar** • 4 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

**Ecological and biological notes**

This species was found nesting under a rock next to a tree of *Vachellia*.

**Geographic range**

This species was originally described from Egypt and has been recorded from Oman, KSA, Yemen (Collingwood & Agosti 1996), UAE (Collingwood *et al.* 2011; Sharaf *et al.* 2018a). This species is reported here for the first time in Dhofar.

*Lepisiota spinisquama* (Kuznetsov-Ugamsky, 1929)

Fig. 21

*Acantholepis frauenfeldi* subsp. *spinisquama* Kuznetsov-Ugamsky, 1929: 483 (w) Kazakhstan. Palearctic.

**Diagnosis**

Body dark brown; propodeal spines shorter and slightly curved, in profile appearing at level of the petiolar spines; body slightly shining; petiolar height lower in profile; appressed pubescence abundant on body.

**Material examined**

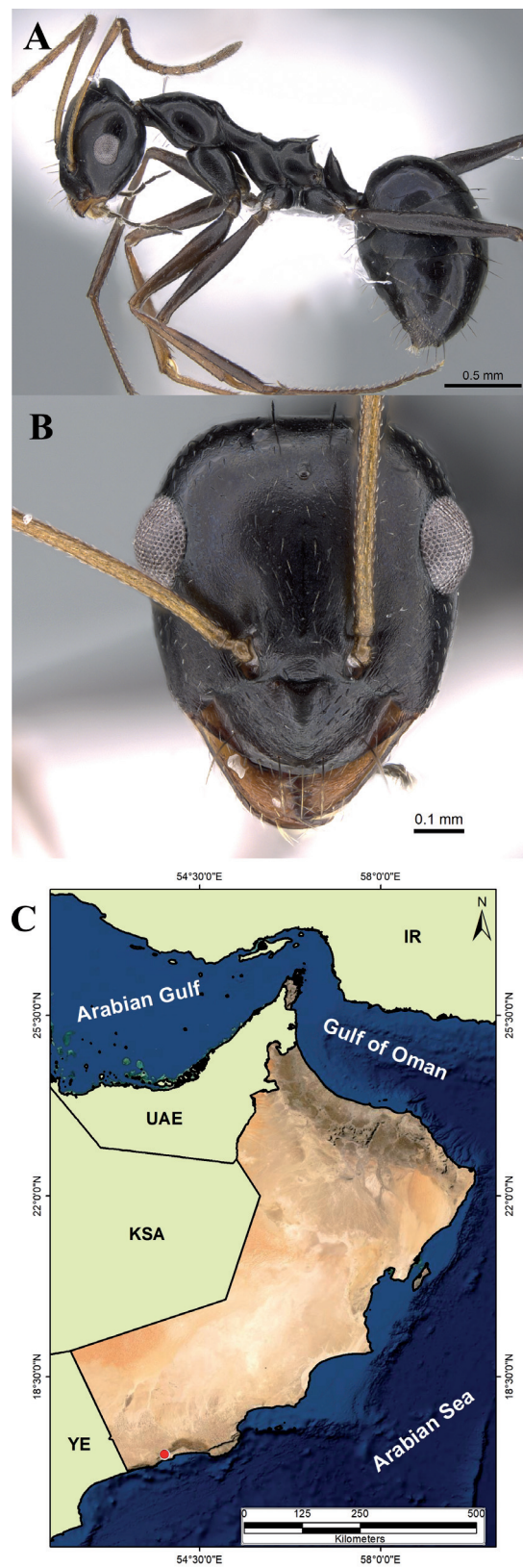
OMAN – **Dhofar** • 1 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 3 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922822; KSMA.

**Ecological and biological notes**

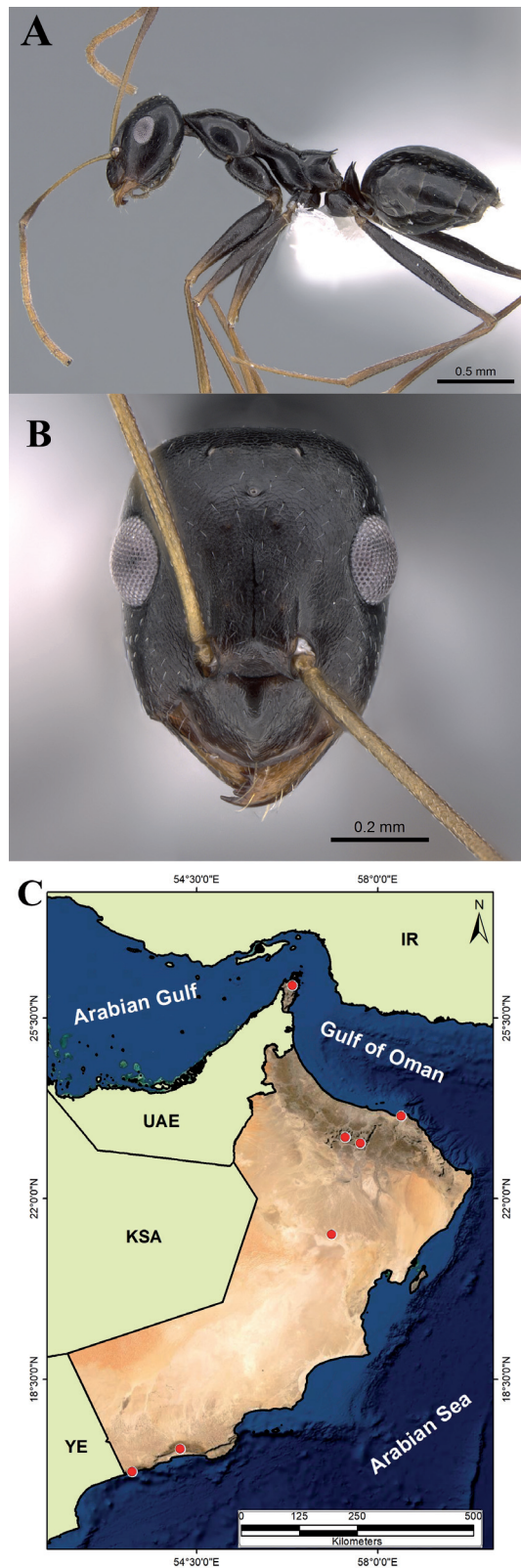
This species was found foraging on small shrubs and was collected using a beating sheet.

**Geographic range**

This species was originally described from Kazakhstan and recorded subsequently from Oman (Collingwood & Agosti 1996) and the Socotra Archipelago (Collingwood 1985; Collingwood *et al.* 2004; Sharaf *et al.* 2017c). Rad *et al.* (2018) recorded it from pitfall traps in Iran. Collingwood (1985) previously reported this species from Dhofar.

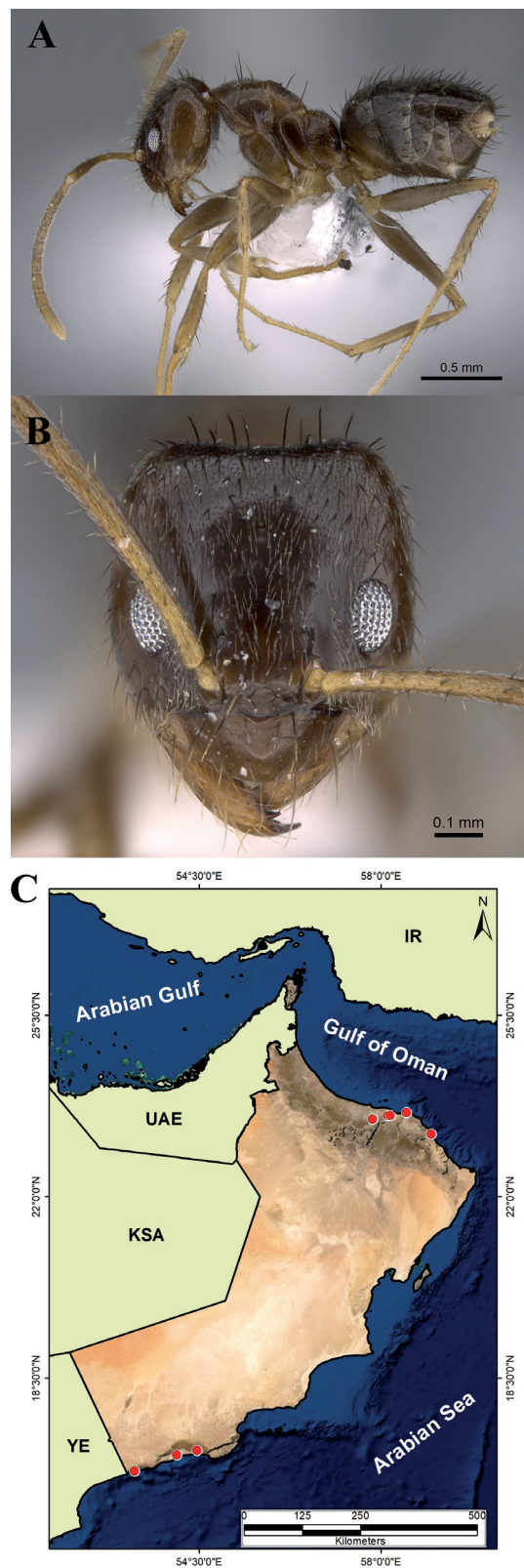


**Fig. 20.** *Lepisiota opaciventris* (Finzi, 1936), worker (CASENT0922269, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 21.** *Lepisiota spinisquama* (Kuznetsov-Ugamsky, 1929), worker (CASENT0922842, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 22.** *Nylanderia jaegerskioeldi* (Mayr, 1904), worker (CASENT0922881, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

Genus *Nylanderia* Emery, 1906

*Nylanderia jaegerskioeldi* (Mayr, 1904)

Fig. 22

*Prenolepis* (*Nylanderia*) *jaegerskioeldi* Mayr, 1904: 8 (w) Egypt. Palearctic.

**Diagnosis**

Color yellow-brown; body covered with abundant stiff setae and dense pubescence; metanotal area compact; propodeum lower than mesonotum, with short dorsal face and longer declivity; declivitous face smooth and shining, without pubescence.

**Material examined**

OMAN – **Dhofar** • 2 m; Salalah; 17.019° N, 54.065° E; alt. 9 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 4 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

**Ecological and biological notes**

*Nylanderia jaegerskioeldi* was collected nesting in moist soil under a rock. Several workers were collected from leaf litter next to the trees of *Vachellia* and *Ficus* L. (Moraceae Gaudich.).

**Geographic range**

Originally described from Egypt, *Nylanderia jaegerskioeldi* is considered a successful tramp species. LaPolla *et al.* (2011) proposed an African origin for this species, but it is widely distributed in the Arabian Peninsula (Collingwood 1985; Collingwood & Agosti 1996; Collingwood *et al.* 1997, 2011), the Palearctic (Espadaler & Bernal 2003; Gómez & Espadaler 2006; Kiran & Kaaman 2012; Borowiec & Salata 2012; Taheri & Reyes-López 2018; Gómez 2017; Rad *et al.* 2018), and the Afrotropical Region (LaPolla *et al.* 2011). This species is reported here for the first time in Dhofar.

Genus *Paratrechina* Motschoulsky, 1863

*Paratrechina longicornis* (Latreille, 1802)

Fig. 23

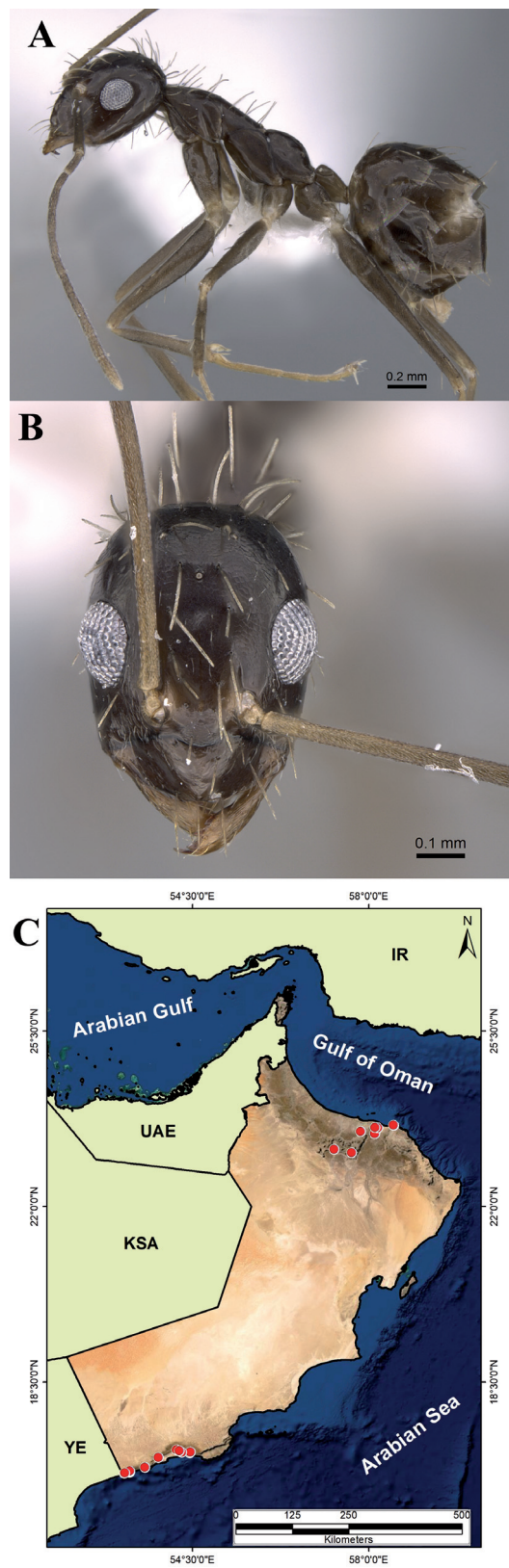
*Formica longicornis* Latreille, 1802: 113 (w) Senegal. Afrotropic.

**Diagnosis**

Head, mesosoma, petiole, and gaster black-brown to dark brown; body with faint bluish iridescence; scapes exceptionally long, when laid back from their insertions surpassing posterior margin of head by at least one-half its length; legs extraordinarily long; pilosity scattered, stout, long, suberect to erect, greyish or whitish setae.

**Material examined**

OMAN – **Dhofar** • 1 w; Agdaroot; 17.089° N, 54.442° E; 18 Nov. 2017; SW; A. Mostafa leg.; KSMA • 1 w; Serfeet Road, 26 km before Serfeet; 16.684° N, 53.139° E; 18 Nov. 2017; SW; A. Mostafa leg.; KSMA • 7 w, 2 q; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 3 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 4 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017;



**Fig. 23.** *Paratrechina longicornis* (Latreille, 1802), worker (CASENT0922867, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 3 w; Dhalkout; 16.705° N, 53.24453° E; alt. 43 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w, 1 m; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Dhalkout; 16.727° N, 53.249° E; alt. 623 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 5 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922867; CASC • 3 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

*Paratrechina longicornis* has diverse nesting and foraging habits (Sharaf *et al.* 2017c) that include soil under rocks, leaf litter which is rich in organic material, and disturbed sites near human settlements. The species was collected foraging near trees of *Ziziphus* Mill. and *Vachellia*.

### Geographic range

Although originally described from Senegal, Wetterer (2008), who examined many global records, felt the origin of this tramp species was probably from Southeast Asia. It is widely distributed in the Arabian Peninsula including Oman (Sharaf *et al.* 2018a), KSA (Collingwood 1985), UAE (Collingwood *et al.* 1997, 2011), Yemen (Collingwood & Agosti 1996), and the Socotra Archipelago (Collingwood *et al.* 2004; Sharaf *et al.* 2017c). This species is reported here for the first time in Dhofar.

Genus *Plagiolepis* Mayr, 1861

*Plagiolepis barbara* Santschi, 1911

Fig. 24

*Plagiolepis pygmaea* var. *barbara* Santschi, 1911: 286 (w, m) Tunisia. Palearctic.

### Diagnosis

Yellow-brown, gaster yellowish, paler than rest of body, legs and antennae yellow, propodeal dorsum red-brown. Eyes, in full-face view, fail to break head sides; second funicular segment as long as or little longer than broad; third funicular segment little longer than broad; second and third funicular segments nearly sub equal; fourth funicular segment distinctly longer than broad, and little longer than third; eyes large with eleven ommatidia in longest row; metanotal groove feebly impressed; dorsum of head with abundant but widely spaced pubescence.

### Material examined

This species was not collected during the present study.

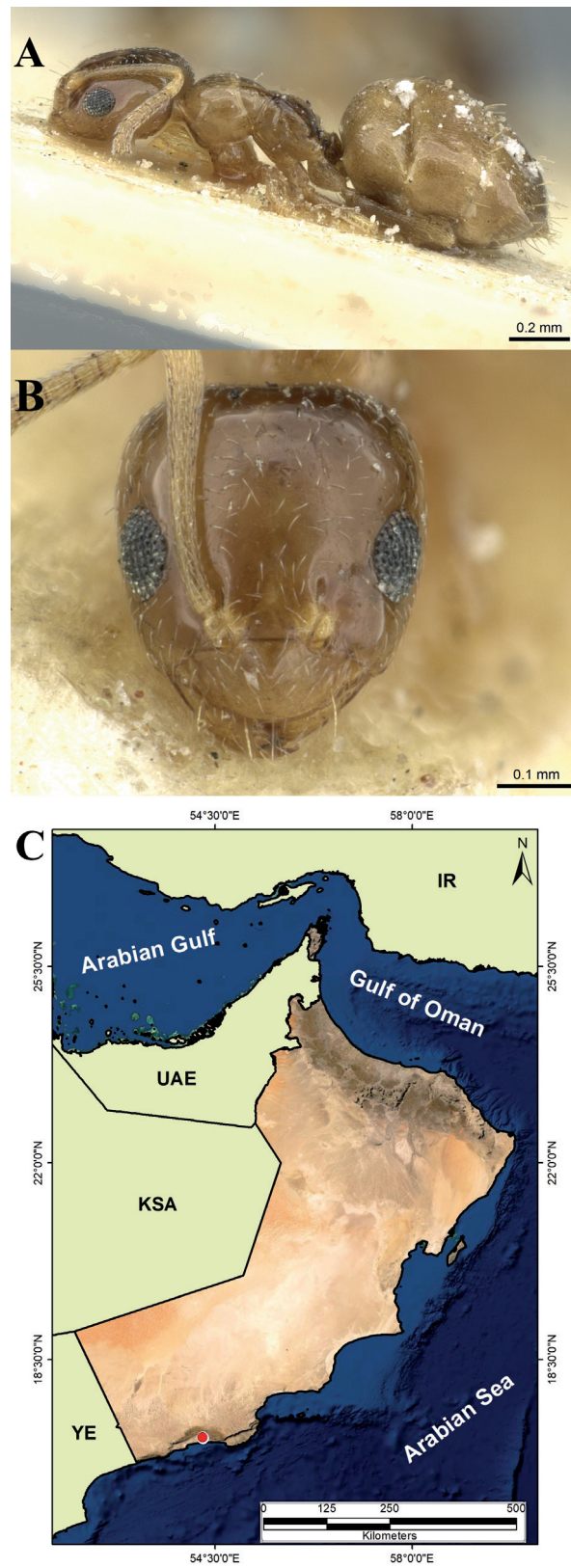
### Ecological and biological notes

It has been found nesting directly in loose, dry soil under rocks in the southwestern Mountains of KSA. In the Canary Islands, Espadaler (2007) noted the same type of nesting habits for the species, but some nests were reported in wood debris.

### Geographic range

It was described first from Morocco, with other records from Tunisia and Algeria (Santschi 1920). The species has been recorded from the Arabian Peninsula from Oman, KSA, and Yemen (Collingwood & Agosti 1996). It is known also from several countries of the Palearctic Region, including the Canary Islands (Espadaler 2007), and Egypt (Sharaf 2006). This species was collected in Dhofar by Collingwood & Agosti (1996).





**Fig. 24.** *Plagiolepis barbara* Santschi, 1911, worker (CASENT0912424, AntWeb.org (Zach Lieberman)).  
A. Body in profile. B. Head in full-face view. C. Distribution map.

Subfamily Leptanillinae Emery, 1019  
Genus *Leptanilla* Emery, 1870

*Leptanilla islamica* Baroni Urbani, 1977  
Fig. 25

*Leptanilla islamica* Baroni Urbani, 1977: 474 (m) Yemen. Afrotropic.

### Diagnosis

#### Male

Uniformly brown color except for paler jaws and legs; head moderately elongated and with curved sides, conspicuously interrupted by compound eyes which are large and strongly projecting on profile; mandibles thick, curved and without teeth; scape short and enlarged, longer than first funicular segment; funicular segments 1–11 gradually decreasing in length and slightly increasing in diameter towards apex; terminal funicular segment little longer than previous one; mesosoma uniformly rounded on sides, gradually descending towards descending face of propodeum; petiole round both on dorsal and lateral sides; fore wing with a distinctly marked short stretch of costal vein and no trace of pterostigma; genitalia much shorter and rounded; short subdecumbent setae sparse on all body surface (Fig. 25).

### Material examined

OMAN – **Dhofar** • 8 m; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; LT; M.R. Sharaf leg.; KSMA • 4 m; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; LT; M.R. Sharaf leg.; KSMA • 1 m; same collection data as for preceding; CASENT0922880; CASC.

### Ecological and biological notes

Nothing is known on the ecology or biology of this species.

### Geographic range

The original description was of a single male from Yemen. Our specimens represent the first records of the subfamily Leptanillinae from Oman. The species has been recorded from Yemen (Collingwood & Agosti 1996; Collingwood & van Harten 2001) and UAE (Collingwood *et al.* 2011). Alates of this subfamily were recently collected using light traps from the southwestern mountains of the KSA (Sharaf & Aldawood unpubl. data).

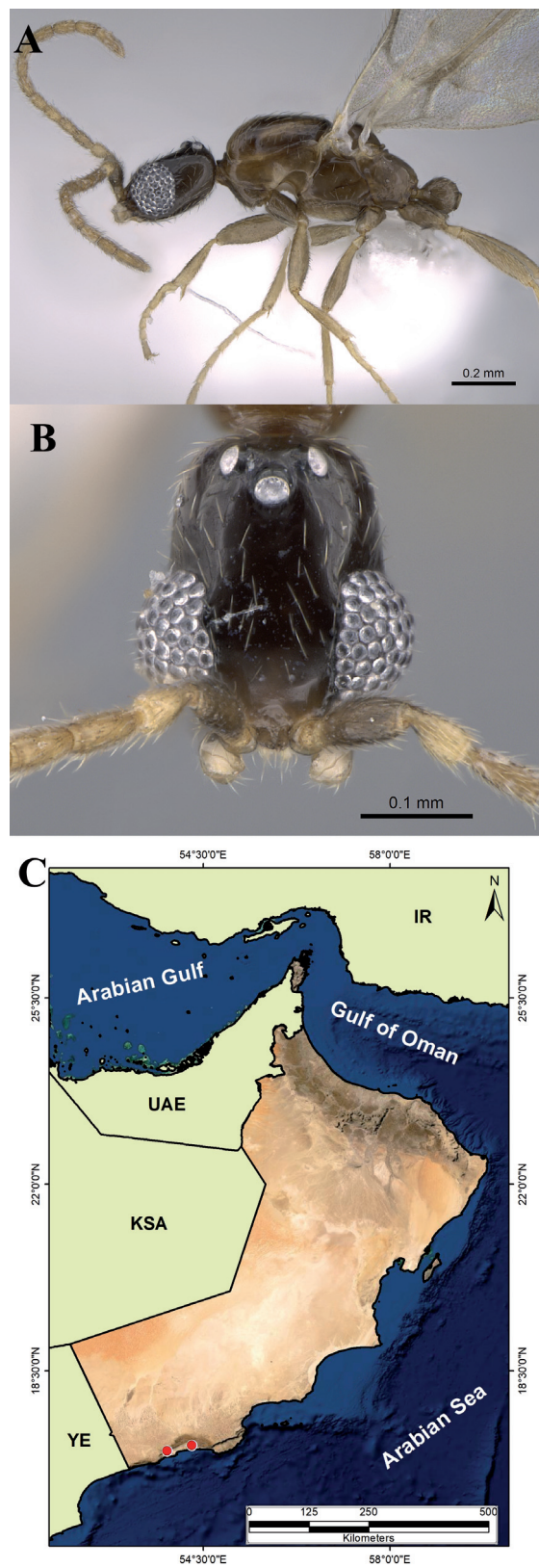
Subfamily Myrmicinae Lepelletier de Saint-Fargeau, 1835  
Genus *Cardiocondyla* Emery, 1869

*Cardiocondyla minutior* Forel, 1899  
Fig. 26

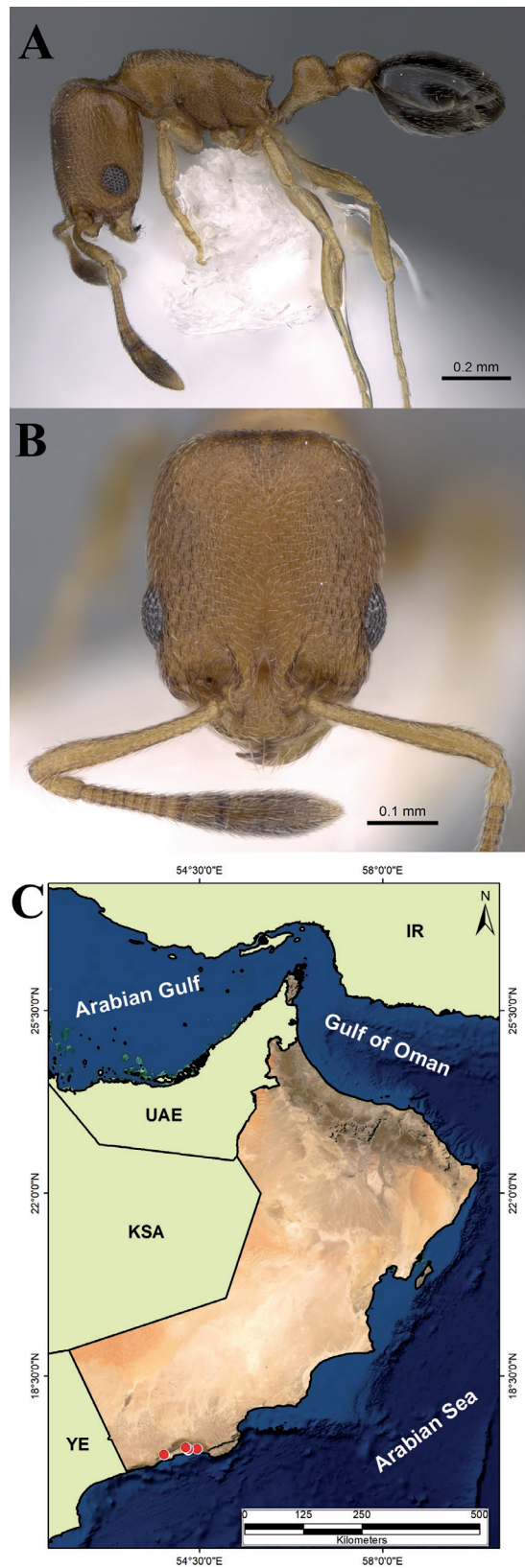
*Cardiocondyla nuda* var. *minutior* Forel, 1899: 120 (w) Hawaii. Oceania.

### Diagnosis

Head, mesosoma, petiole, and postpetiole dirty yellow to dark brown, gaster brown to black-brown; posterior margin of head straight or shallowly concave; eyes small, with distinct microsetae; anterior clypeal margin with a shallow central concavity; metanotal groove feebly impressed or absent; mesosomal outline in profile nearly straight or weakly convex; propodeal spines short and acute; petiolar node in dorsal view circular and as long as broad; postpetiole low, without anteroventral bulge (Fig. 26).



**Fig. 25.** *Leptanilla islamica* Baroni Urbani, 1977, ♂ (CASENT0922880, AntWeb.org (Michele Esposito)). A. Body in profile. B. Head in full-face view. C. Distribution map.



**Fig. 26.** *Cardiocondyla minutior* Forel, 1899, worker (CASENT0922873, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



### Material examined

OMAN – **Dhofar** • 7 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 11 w, 1 q; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 10 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

Workers of this species were collected foraging on a small shrub; others were found in leaf litter under several trees including *Ziziphus* sp., *Prosopis*, *Vachellia*, and *Ficus* where the soil was rich in organic matter.

### Geographic range

*Cardiocondyla minutior* is a successful tramp species (Seifert 2003), originally described from Hawaii, and recorded from the Socotra Archipelago by Sharaf *et al.* (2017c). Our specimens represent a new species record for Oman.

### *Cardiocondyla wroughtonii* (Forel, 1890)

Fig. 27

*Emeryia wroughtonii* Forel, 1890: cxi (ergatoid m) India. Indomalaya.

### Diagnosis

Head, mesosoma, and appendages yellow to yellowish brown, gaster brown; small species with relatively broad head; scapes fail to reach posterior margin of head in full-face view; eyes with 9–11 ommatidia in longest row; mesosoma in profile with mesonotal dorsum abruptly sloped posteriorly and descending steeply to a deeply impressed metanotal groove; petiole node in dorsal view subglobular, slightly broader than long; pronotal corners rounded in dorsal view; propodeal spines narrow and well-developed (Fig. 27).

### Material examined

INDIA • Poona; Wroughton leg.; feuilles d'*Eugenia* L.; CASENT0908349; MHNG.

OMAN – **Dhofar** • 2 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

This species was found in leaf litter under a tree of *Prosopis*.

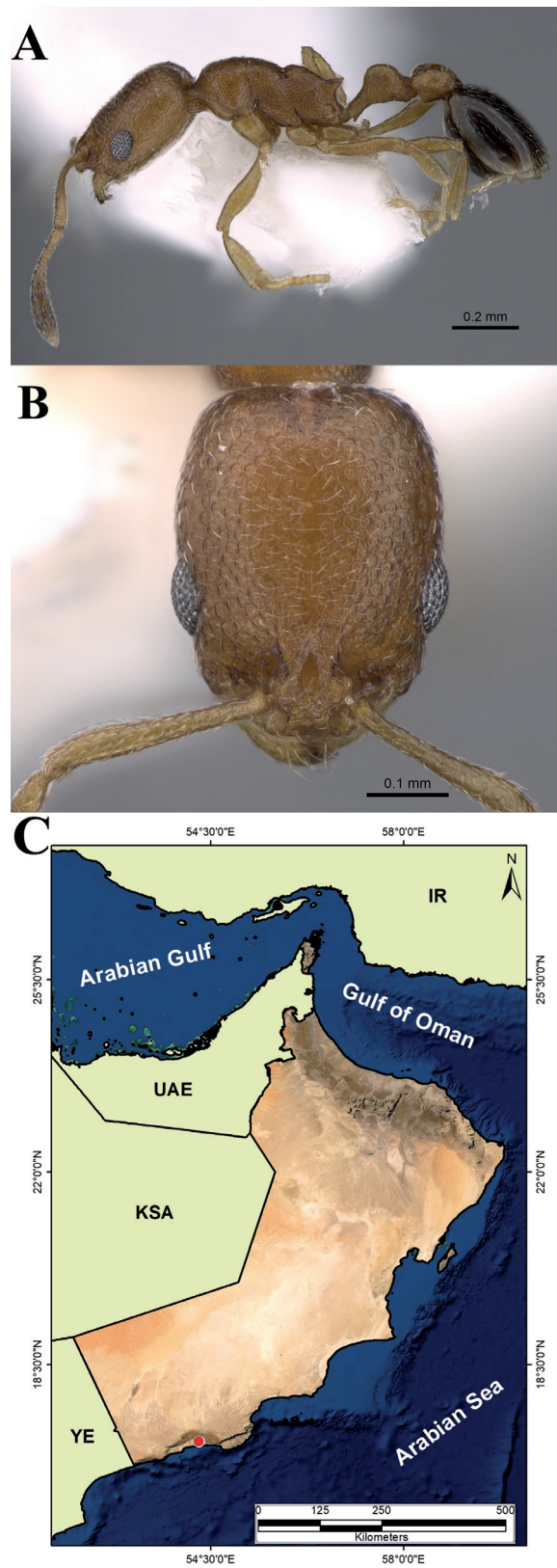
### Geographic range

First described from India, *Cardiocondyla wroughtonii* has since been recorded from KSA, Yemen (Collingwood & Agosti 1996; Collingwood & van Harten 2001), Egypt (Sharaf 2006), and Israel (Kugler 1984). This species, which is similar to *C. minutior*, is a successful tramp species that has been widely introduced into East Africa (Bolton 1982), the Australian, the Nearctic, and the Oriental Regions (Seifert 2003). Our collection represents a new record for Oman.

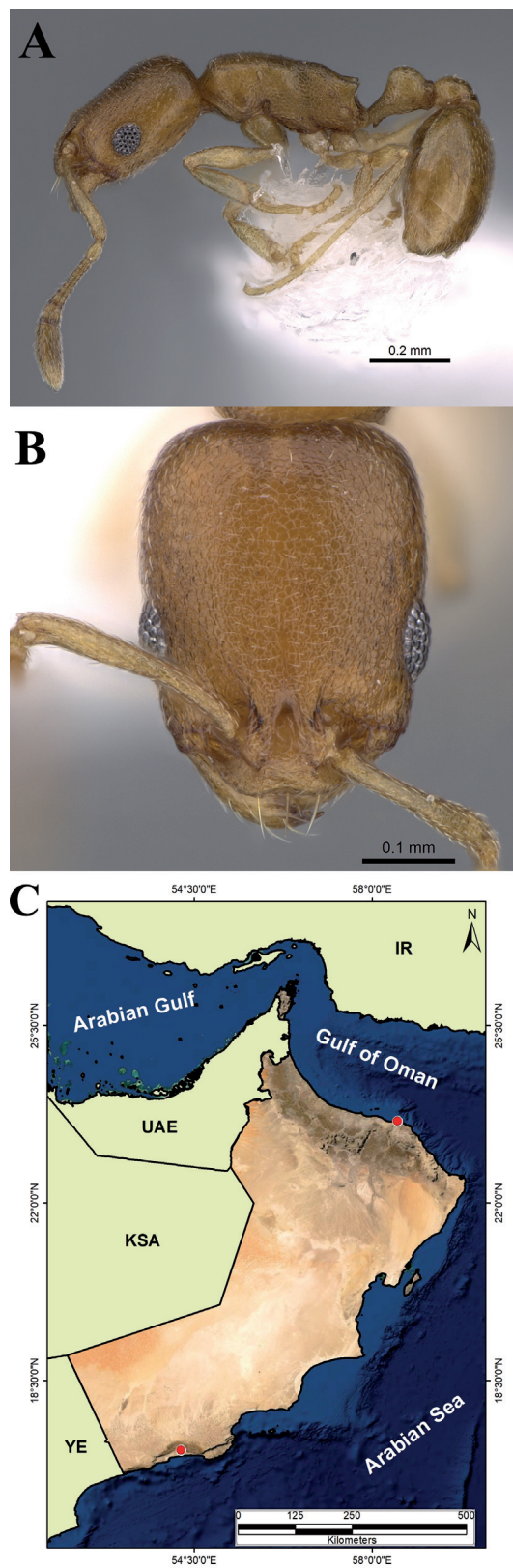
### *Cardiocondyla yemeni* Collingwood & Agosti, 1996

Fig. 28

*Cardiocondyla yemeni* Collingwood & Agosti, 1996: 328 (w). Yemen. Afrotropic.



**Fig. 27.** *Cardiocondyla wroughtonii* (Forel, 1890), worker (CASENT0922871, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 28.** *Cardiocondyla yemeni* Collingwood & Agosti, 1996, worker (CASENT0922874, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Diagnosis

Uniform yellow; propodeal spines short and broad dentate; petiole in profile slightly low and broadly rounded; postpetiole narrow in dorsal view, clearly less than twice as broad as petiole; legs and antennae pale yellow-brown; reticulopunctate sculpture on whole body dorsum.

### Material examined

OMAN – Dhofar • 14 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

It was collected from leaf litter under a tree of *Ziziphus* sp. where the soil was mixed with sheep and goat feces.

### Geographic range

This species was first described from Yemen (Collingwood & Agosti 1996) and recently recorded from Oman (Sharaf *et al.* 2018a). This species is reported here for the first time in Dhofar.

Genus *Carebara* Westwood, 1840

*Carebara arabica* (Collingwood & van Harten, 2001)

Fig. 29

*Oligomyrmex arabicus* Collingwood & van Harten, 2001: 564 (s, w) Yemen. Afrotropic.

### Diagnosis

#### Major worker

Uniform brown, antennae, and legs yellow; antennae 10-segmented with a 2-segmented club; posterior margin of head sharply concave and posterior corners with a pair of teeth, appearing blunt in profile; cephalic dorsum dull, with regular and dense and longitudinal rugulae; lateral margins of postpetiole in dorsal view rounded.

#### Minor worker

Uniform yellow; antennae 10-segmented; eyes tiny, with a single ommatidium; anterolateral sides of head finely longitudinally striated; lower halves of mesopleuron, metapleuron, petiole, and postpetiole areolate-rugose; propodeal dorsum nearly half as long as propodeal declivity in profile (Fig. 29).

### Material examined

OMAN – Dhofar • 1 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

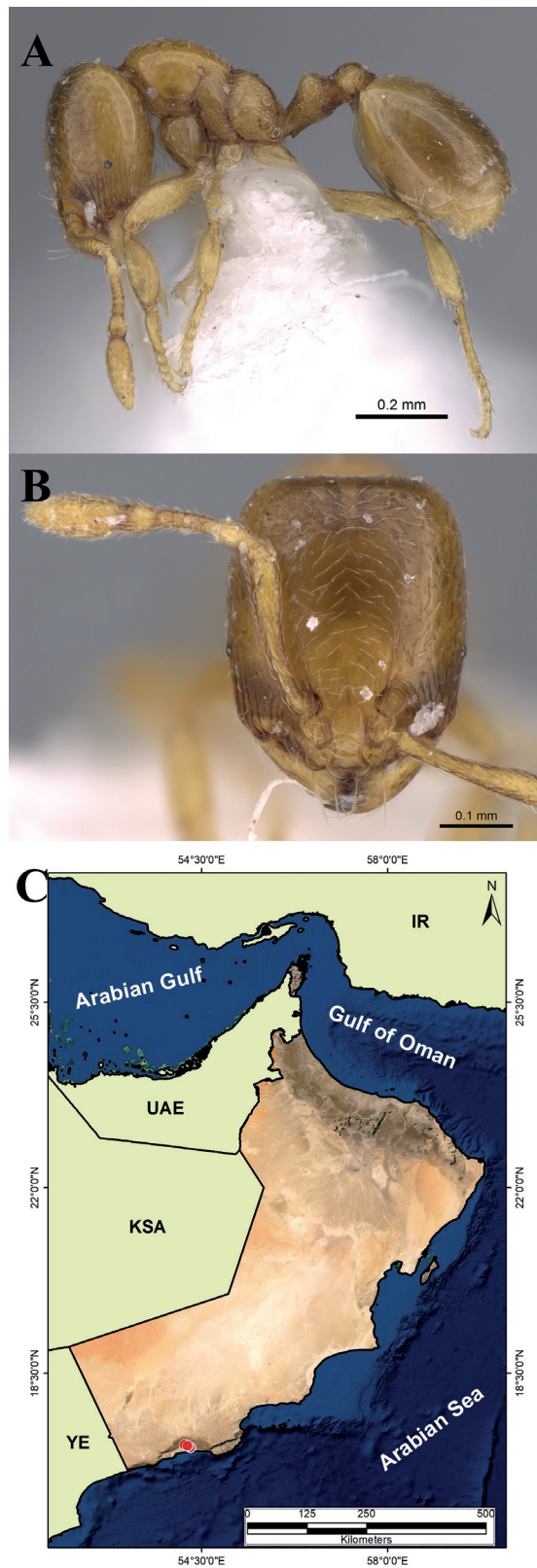
### Ecological and biological notes

Workers were collected foraging in dry soil under a tree of *Prosopis*. Several minor workers were observed foraging on the ground next to a tree of *Ziziphus* sp. where the soil was dry and rich in organic matter. In the Asir Mountains of KSA, *C. arabica* was found nesting in humid compact clay soil of banana plantations where minor workers were foraging above the soil surface.

### Geographic range

Originally described from Yemen (Collingwood & van Harten 2001), it has been also recorded from KSA (Aldawood *et al.* 2011). The genus and species are new records for Oman.





**Fig. 29.** *Carebara arabica* (Collingwood & van Harten, 2001), minor worker (CASENT0922870, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

Genus *Crematogaster* Lund, 1831

*Crematogaster acaciae* Forel, 1892

Fig. 30

*Crematogaster acaciae* Forel, 1892: 141 (w) Ethiopia. Afrotropic.

**Diagnosis**

Body uniform yellow; head, in full-face view, with a shallow frontal triangle and without longitudinal carina; postpetiole in dorsal view broader posteriorly than anteriorly; propodeal dorsum seen from above longitudinally striated.

**Material examined**

This species was not collected during the present study.

**Ecological and biological notes**

Nothing has been reported on the ecology of this species.

**Geographic range**

Originally described from Ethiopia and subsequently recorded from Oman (Collingwood 1985; Collingwood & Agosti 1996). This species was previously recorded from Dhofar based on two workers (Collingwood 1985).

*Crematogaster chiarinii* Emery, 1881

Fig. 31

*Crematogaster chiarinii* Emery, 1881a: 271 (w) Ethiopia. Afrotropic.

**Diagnosis**

Head, petiole, postpetiole, and gaster dark brown, mesosoma light brown; head, in full-face view, with a well-defined frontal triangle and posterior longitudinal carina reaching posterior margin of eyes; propodeal dorsum transversally striated in dorsal view; postpetiole seen from above as broad anteriorly as posteriorly.

**Material examined**

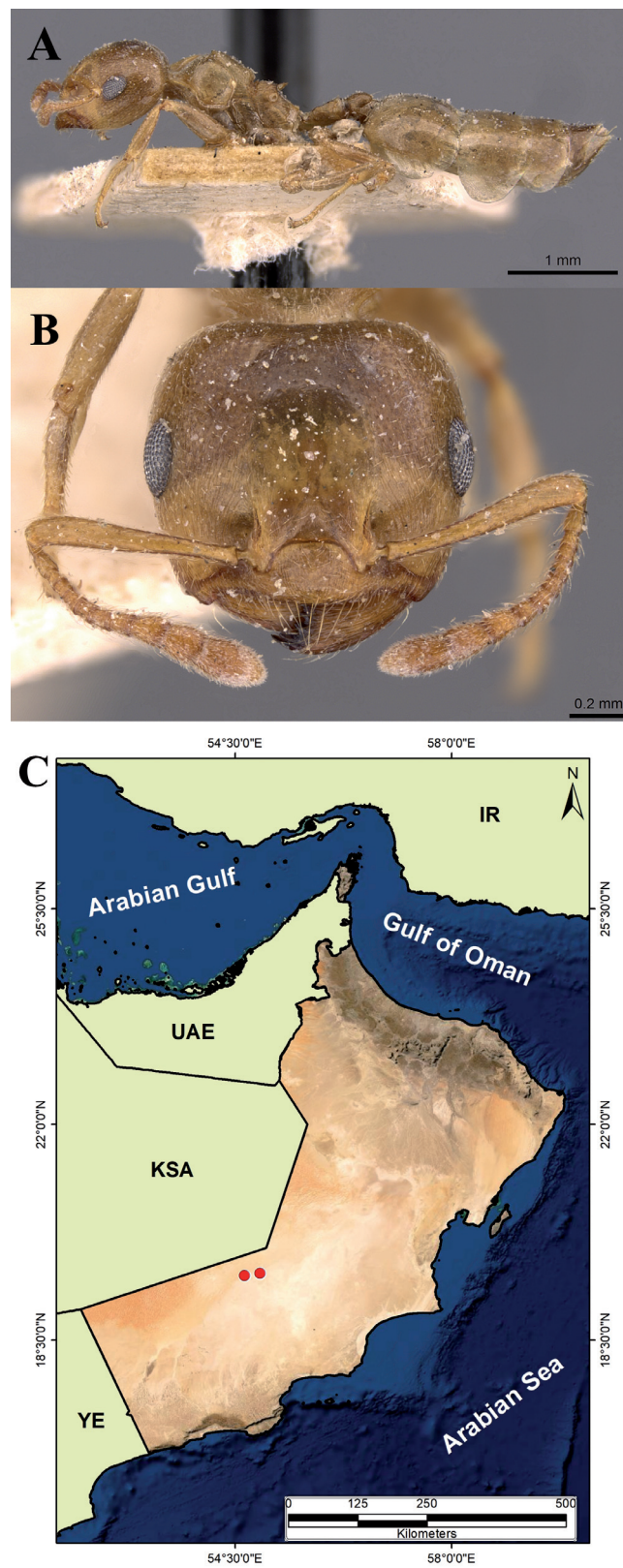
This species was not collected during the present study.

**Ecological and biological notes**

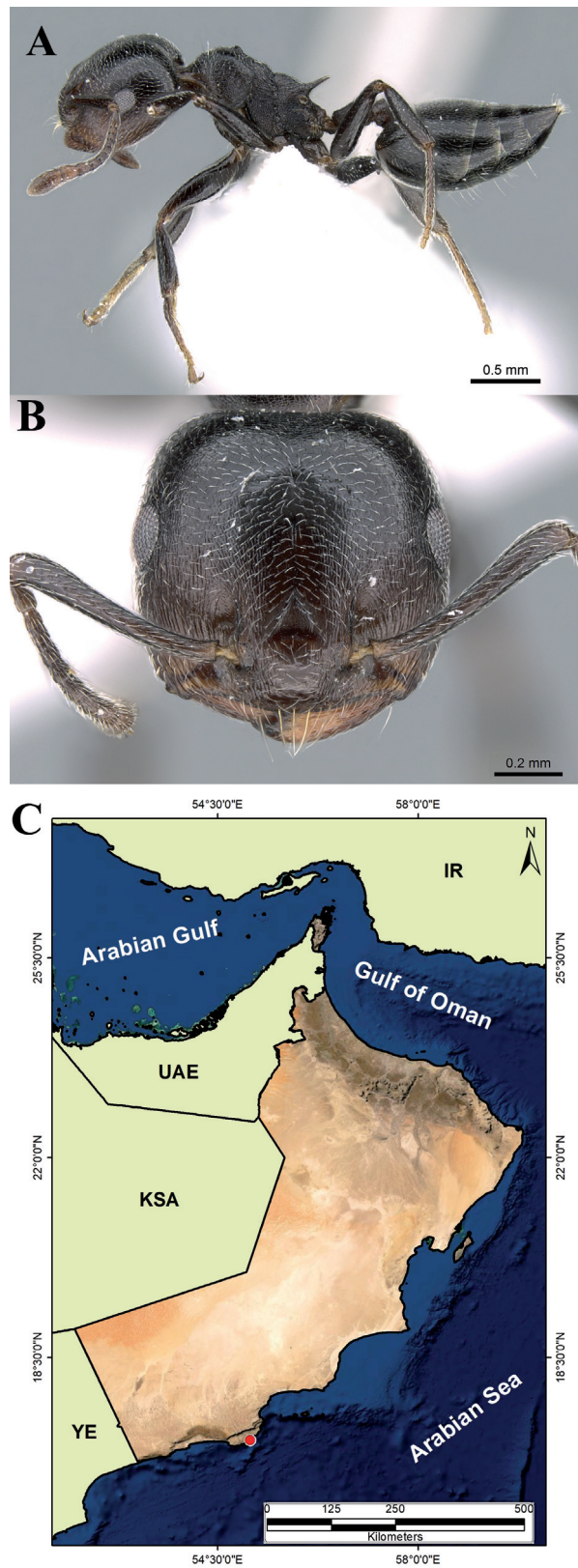
This species forms large colonies with workers foraging among myrmecophilous myrmedoniine beetles at the base of trees of *Vachellia* (Collingwood 1985).

**Geographic range**

*Crematogaster chiarinii* was originally described from Ethiopia and elsewhere in north-east Africa. It was later recorded from Oman, KSA, and Yemen (Collingwood 1985; Collingwood & Agosti 1996; Collingwood & van Harten 2001). This species has been recorded from Dhofar by Collingwood (1985) based on a single specimen.



**Fig. 30.** *Crematogaster acaciae* Forel, 1892, syntype, worker (CASENT0908494, AntWeb.org (Zach Lieberman)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 31.** *Crematogaster chiarinii* Emery, 1881, worker (CASENT0906369, AntWeb.org (Estella Ortega)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



*Creinatogaster jacindae* Sharaf & Hita Garcia, 2019

Fig. 32

*Creinatogaster jacindae* Sharaf & Hita Garcia, 2019 in Sharaf *et al.* 2019: 58 (w) Oman. Afrotropic.

**Diagnosis**

Bicolored species, head black-brown to black, mesosoma, petiole, and postpetiole dark brown, gaster golden yellow; area in front of eyes finely longitudinally striated; cephalic surface feebly imbricate; eyes with about 11 ommatidia in longest row; mesonotum without tubercle; mesopleura and metapleura clearly imbricate; mesonotum with a single pair of setae; propodeal spiracles slit-shaped.

**Material examined**

OMAN – **Dhofar** • w, holotype; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; M.R. Sharaf leg.; KSMA • w, paratype; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 11 w; same collection data as for paratype; KSMA • 1 w, paratype; same collection data as for paratype; CASENT0922856; CASC • 1 w; same collection data as for paratype; WMLC • 8 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; ML; M.R. Sharaf leg.; KSMA • 16 w; Dhalkout; 16.727° N, 53.249° E; alt. 623 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 7 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 17 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 4 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 20 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; BS; M.R. Sharaf leg.; KSMA.

**Ecological and biological notes**

The microhabitats of *C. jacindae* included leaf litter, soil, under stones, or on native vegetation, especially *Vachellia*. The majority of specimens were collected foraging on plants using a beating sheet. Workers were observed foraging on ground and wild shrubs (Sharaf *et al.* 2019).

**Geographic range**

Only known from Oman.

Genus *Meranoplus* Smith, 1853

*Meranoplus mosalahi* Sharaf, 2019

Fig. 33

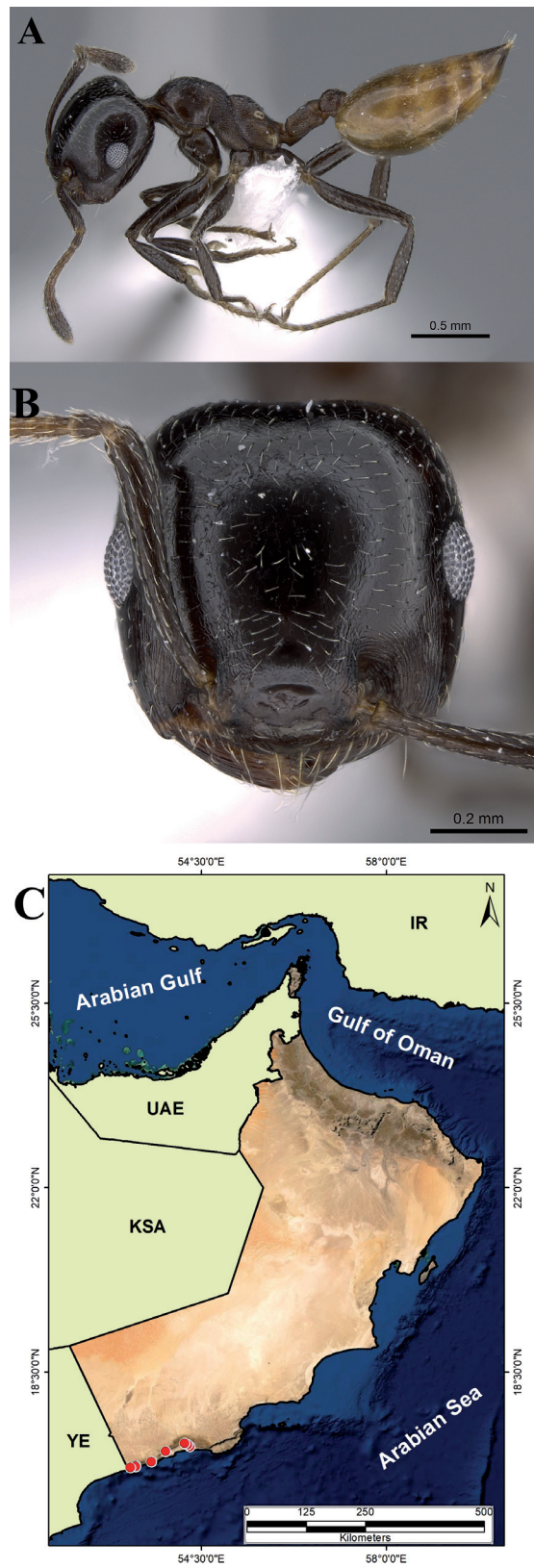
*Meranoplus mosalahi* Sharaf, 2019 in Sharaf & Aldawood 2019: 6 (w) Oman. Afrotropic.

**Diagnosis**

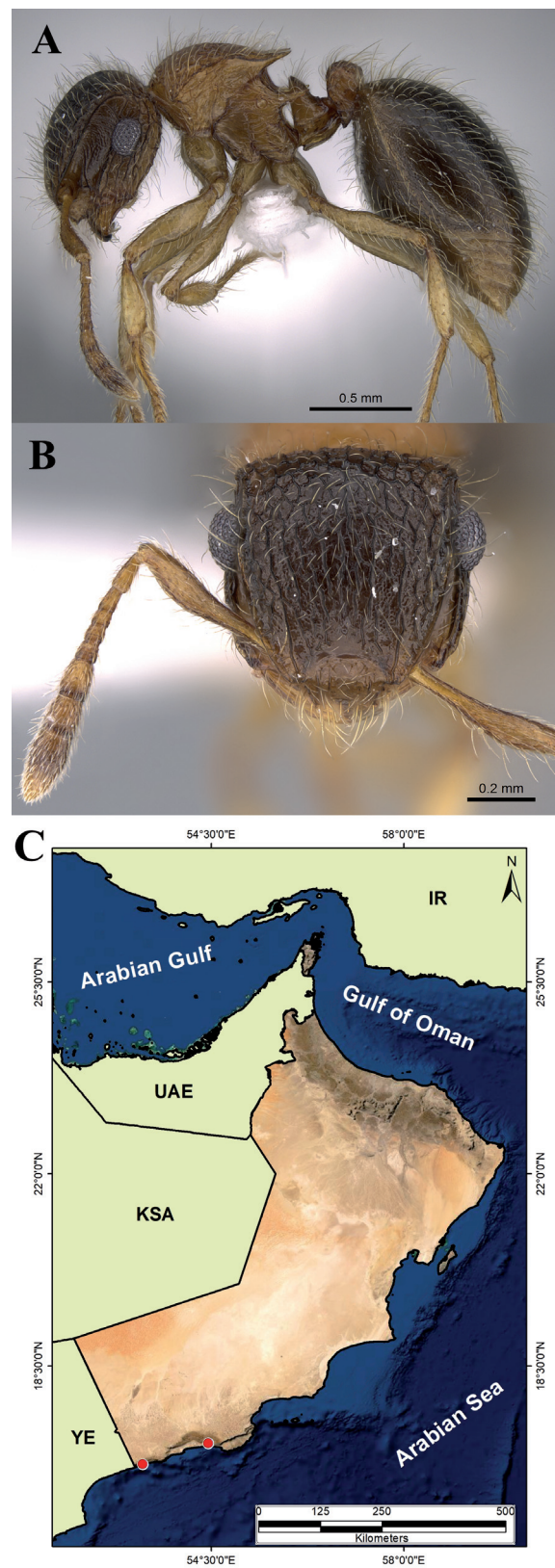
Head, and gaster brown, antennae, mesosoma, petiole, and postpetiole pale brown, legs yellow; anterior clypeal margin feebly concave or straight with one pair of reduced teeth; scrobe narrowly visible in full-face view; cephalic surface to posterior level of eyes with irregular interrupted longitudinal rugae; cephalic surface with distinct fine ground sculpture between rugae; anterior face of petiolar node smooth; posterior face feebly sculptured with about five longitudinal rugae.

**Material examined**

OMAN – **Dhofar** • w, holotype; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; CASENT0845901; KSMA • 12 w, paratypes; same collection data as for holotype; KSMA •



**Fig. 32.** *Crematogaster jacindae* Sharaf & Hita Garcia, 2019, paratype, worker (CASENT0922856, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 33.** *Meranoplus mosalahi* Sharaf, 2019, paratype, worker (CASENT0922861, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

1 aberrant worker with reduced postpetiole; same collection data as for holotype; KSMA • 1 w; same collection data as for holotype; WMLC • 1 w; same collection data as for holotype; CASENT0922861; CASC • 3 w; Agdaroot; 17.089° N, 54.442° E; 18 Nov. 2017; SW; A. Mostafa leg.; KSMA.

### Ecological and biological notes

*Meranoplus mosalahi* inhabits shaded areas in Dhalkoout forests with ample small shrubs and grasses. Workers of this species are slow moving and forage on the ground where the soil is moderately moist (Sharaf & Aldawood 2019).

### Geographic range

*Meranoplus mosalahi* is endemic to Oman.

Genus *Messor* Forel, 1890

*Messor ebeninus* Santschi, 1927

Fig. 34

*Messor semirufus* var. *ebeninus* Santschi, 1927: 229 (w) Lebanon. Palearctic.

### Diagnosis

Uniform black, posterior margin of head with 1–5 setae at each side; propodeum broadly angulate; propodeum with 1–2 pairs of setae, one pair on each petiole and postpetiole; several pairs over gastral tergite.

### Material examined

OMAN – Dhofar • 6 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; HP; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

Workers of this species can be found abundantly in most valleys of the Arabian Peninsula, nesting in ground under stones, and foraging in high numbers on ground and feeding on various plant seeds (Collingwood 1985).

### Geographic range

*Messor ebeninus* was originally described from Lebanon and has been recorded from several Palearctic countries, including Oman, KSA, Kuwait, UAE, Yemen (Collingwood 1985; Collingwood & Agosti 1996; Collingwood *et al.* 2011), Egypt (Sharaf 2006), Israel (Vonshak & Ionescu-Hirsch 2009), Iran (Paknia *et al.* 2008), and Turkey (Kiran & Karaman 2012). This species is reported here for the first time in Dhofar.

*Messor galla* (Mayr, 1904)

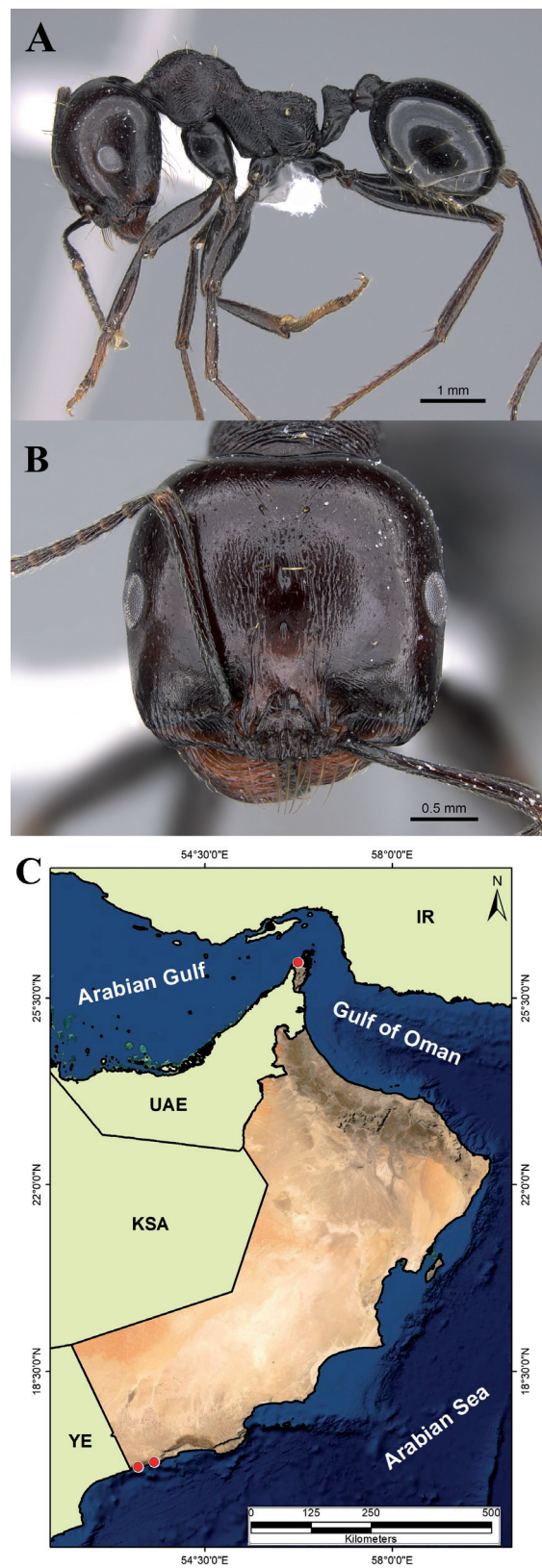
Fig. 35

*Stenammas (Messor) barbarum* var. *galla* Mayr, 1904: 5 (w) Ethiopia. Afrotropic.

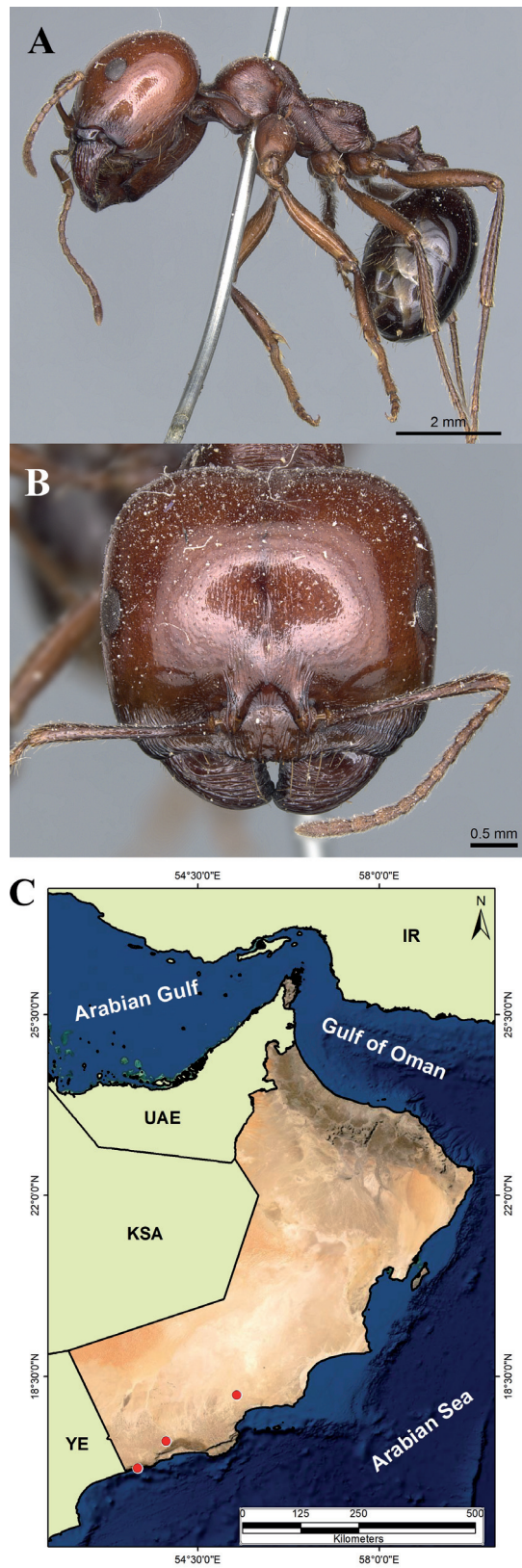
### Diagnosis

Body brown, gaster black-brown; cephalic surface entirely smooth except for median rugae; dorsum of propodeum with one or more pairs of standing setae; posterior margin of head with one or more pairs of projecting setae on each side; postpetiole in profile with a sharp ventral tooth projecting anteriorly.





**Fig. 34.** *Messor ebeninus* Santschi, 1927, major worker (CASENT0922882, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 35.** *Messor galla* (Mayr, 1904), worker (CASENT0904127, AntWeb.org (Will Ericson)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Material examined

This species was not collected during the present study.

### Ecological and biological notes

Nothing has been published on the ecology of this species. Most likely, *M. galla* has nesting and feeding habits similar to other species of *Messor* of the region.

### Geographic range

A species originally described from Ethiopia and known from the northern Africa savannah and Sahel zones (Bolton 1982). Since reported from the Arabian Peninsula, Oman, KSA, and Yemen (Collingwood & Agosti 1996). This species was recorded from Dhofar based on two specimens studied by Collingwood & Agosti (1996).

Genus *Monomorium* Mayr, 1855

*Monomorium carbo* Forel, 1910

Fig. 36

*Monomorium salomonis* var. *carbo* Forel, 1910: 251 (w) Eritrea. Afrotropic.

### Diagnosis

Color uniform dark brown to black-brown; maximum diameter of eye  $0.24\text{--}0.26 \times$  head width; anterior median margin of clypeus feebly concave; posterior margin of head shallowly concave; eye with 7 ommatidia in longest row; metanotal groove shallowly impressed; posterior margin of head with a pair of setae; mesosomal dorsum without setae; petiole and postpetiole each with 1–2 pairs of backward directed hairs; first gastral tergite with numerous evenly distributed setae; cephalic dorsum dull, shagreenate-punctulate; first gastral tergite shining, with superficial reticulations.

### Material examined

This species was not collected during the present study.

### Ecological and biological notes

Nothing has been published on the ecology of this species.

### Geographic range

A species originally described from Ethiopia and later recorded from Oman, KSA (Collingwood & Agosti 1996), and UAE (Collingwood *et al.* 2011). *Monomorium carbo* was reported from Dhofar based on a single worker specimen (Collingwood & Agosti 1996).

*Monomorium clavicorne* André, 1881

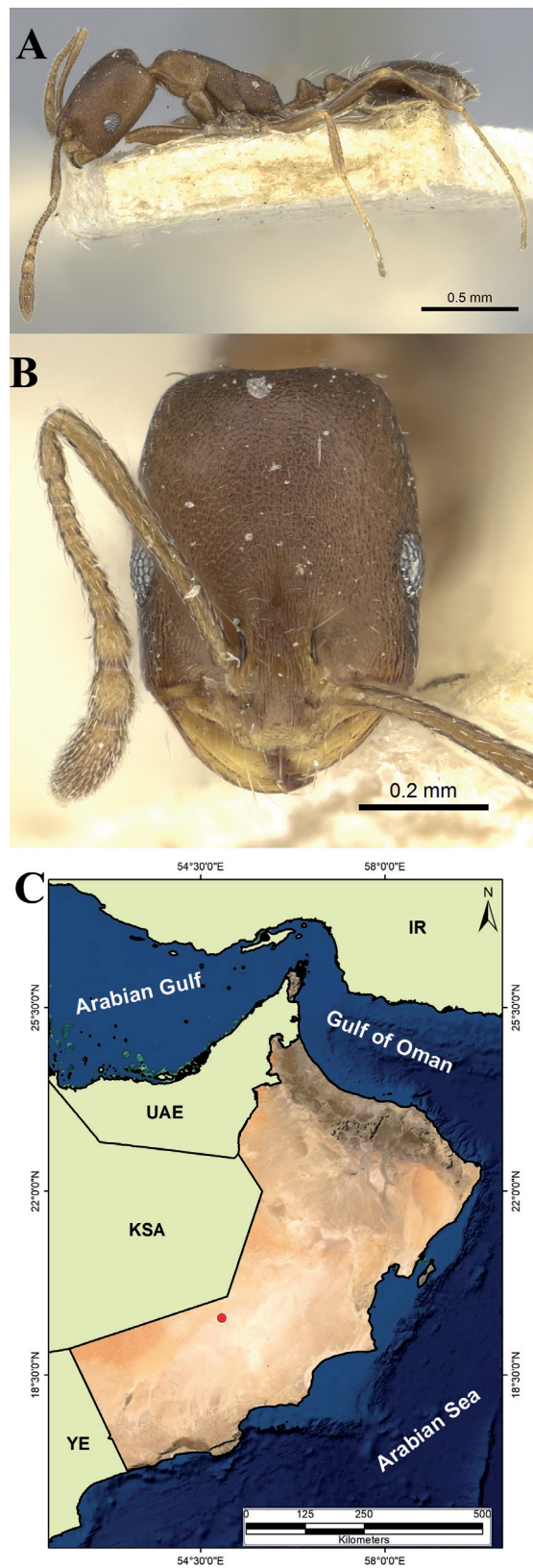
Fig. 37

*Monomorium clavicorne* André, 1881: 68 (w) Israel. Palearctic.

### Diagnosis

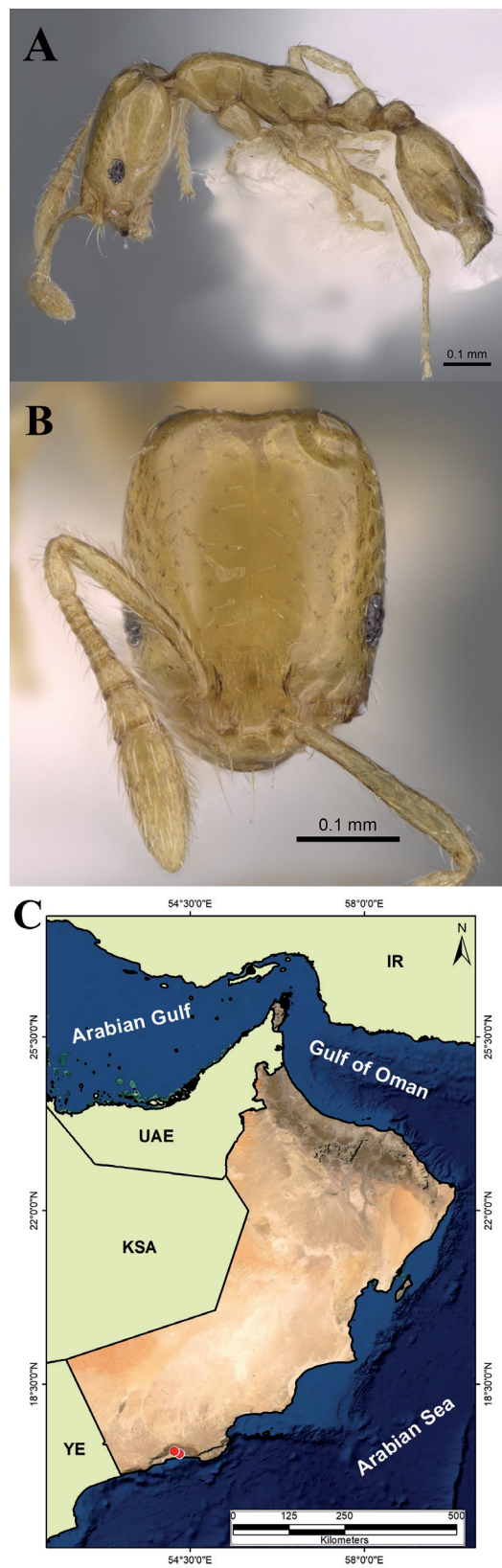
Uniform clear yellow; head in full-face view distinctly longer than broad; terminal funicular segment enlarged, more than twice as long as the two preceding segments; eyes oval, with a ring of ommatidia encircling two inner short rows of 2–3 ommatidia; promesonotal dorsum shallowly convex; metanotal groove sharply-defined; petiole massive, slightly higher than postpetiolar node in profile; anterior





**Fig. 36.** *Monomorium carbo* Forel, 1910, syntype, worker (CASENT0249908, AntWeb.org (Shannon Hartman)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 37.** *Monomorium clavicorne* André, 1881, major worker (CASENT0922879, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

peduncle short; cephalic surface smooth and shining; mesosoma with only two pairs of standing hairs, one on pronotal corners and one on propodeum (Fig. 37).

#### Material examined

##### Holotype

ISRAEL • pinned worker; Jaffa; CASENT0915416; MNHN.

OMAN – **Dhofar** • 5 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

#### Ecological and biological notes

Workers were collected from dry leaf litter next to a tree of *Prosopis*.

#### Geographic range

*Monomorium clavicorne* was described from Israel and subsequently recorded from several countries in the Palearctic Region including Egypt, Iran, Israel, and Palestine, KSA, Lebanon, Morocco, Syria, Tunisia, Turkey, and UAE (Sharaf *et al.* 2018b). The above specimens represent a new species record for Oman.

#### *Monomorium sahlbergi* Emery, 1898

Fig. 38

*Monomorium sahlbergi* Emery, 1898: 131 (w, q) Israel. Palearctic.

#### Diagnosis

This species is most similar to the cosmopolitan species *Monomorium pharaonis* (Linnaeus, 1758) from which it can be recognized by the fine longitudinal striations on head, the smooth first gastral tergite, and the dark patches in front of the eyes.

#### Material examined

OMAN – **Dhofar** • 1 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; CASENT0922875; KSMA.

#### Ecological and biological notes

*Monomorium sahlbergi* prefers nesting directly in moist soil of banana plantations which is rich in decaying livestock feces (Sharaf *et al.* 2017c). Pselaphine beetles were observed close their nests in the Socotra Archipelago.

#### Geographic range

This species was described from India (Forel 1902) and is recorded from the Socotra Archipelago by Sharaf *et al.* (2017c). Our collection represents a new record for Dhofar.

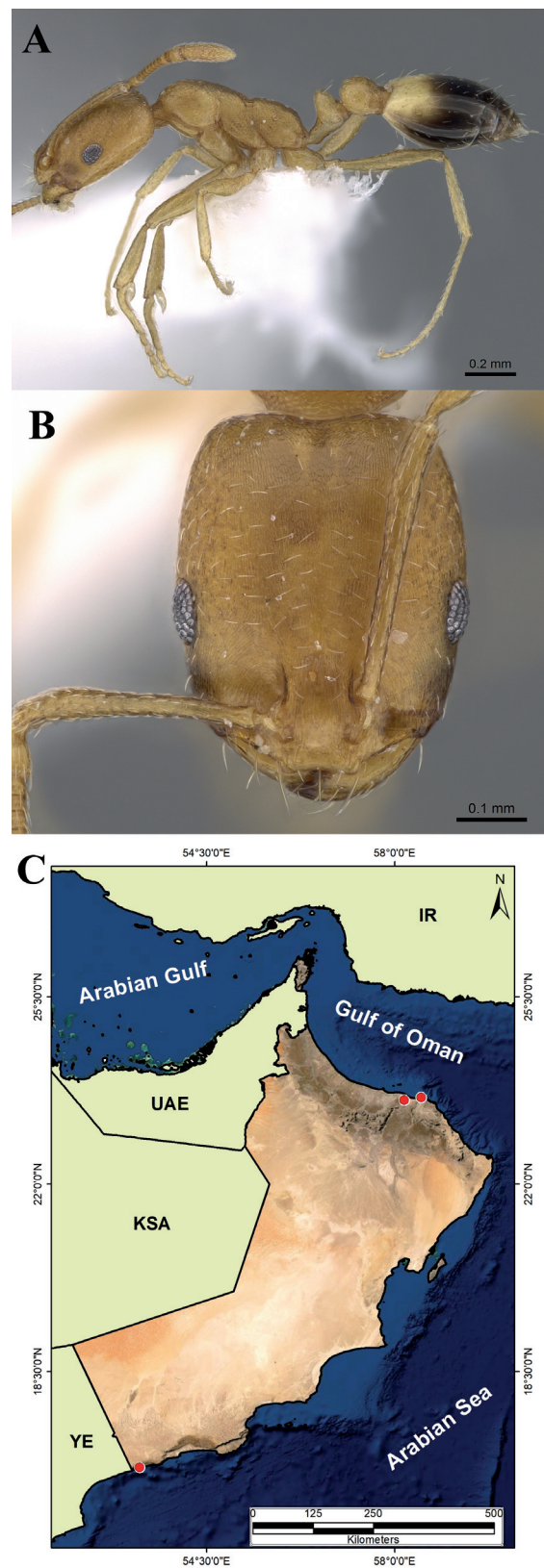
#### *Monomorium exiguum* Forel, 1894

Fig. 39

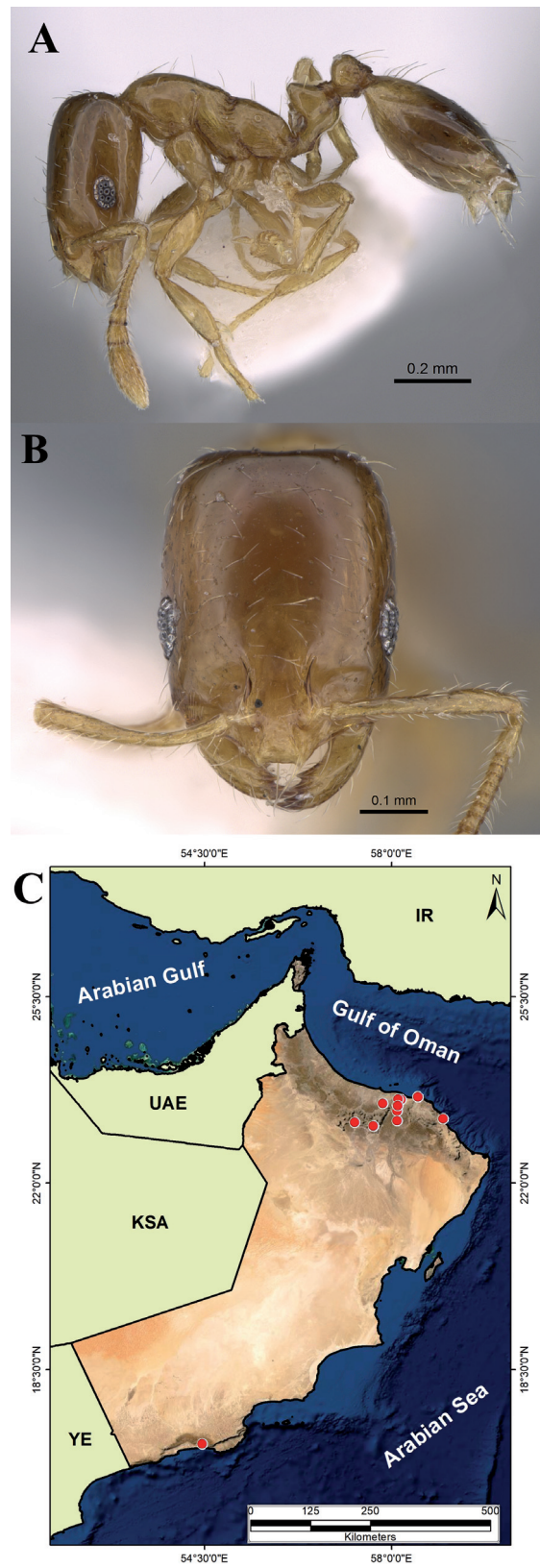
*Monomorium exiguum* Forel, 1894: 85 (w) Ethiopia. Afrotropic.

#### Diagnosis

Color varies from clear yellow to uniform dark brown, usually with a pair of brown patches on first gastral tergite; metanotal groove sharply impressed; propodeal dorsum and declivity meeting in a rounded convexity; body smooth and shining, except for metanotal cross-ribs on sides of metanotal groove.



**Fig. 38.** *Monomorium sahlbergi* Emery, 1898, worker (CASENT0922304, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 39.** *Monomorium exiguum* Forel, 1894, worker (CASENT0922878, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



### Material examined

#### Lectotype

ETHIOPIA • Shoa, 3; CASENT0101870; MHNG.

#### Paralectotype

ETHIOPIA • same collection data as for lectotype; CASENT0101853; MHNG.

OMAN – Dhofar • 1 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

*Monomorium exiguum* is the most widely distributed species of the *M. monomorium* species group of the Arabian Peninsula. It has a remarkable ability to inhabit most types of environments including natural and urban sites, native and established agricultural areas, and nests in leaf litter, in sandy and clay soils, or under rocks and bark (Sharaf *et al.* 2018a, 2018b). This diversity of habitats could reflect the occurrence of several cryptic species currently listed under one name.

### Geographic range

This species was originally described from Ethiopia and is widely distributed in several zoogeographical regions including the Palearctic (Sharaf *et al.* 2018b), the Afrotropical (Bolton 1987; Sharaf *et al.* 2017c), the Malagasy Region (Heterick 2006), and the Mediterranean Basin (Gómez & Espadaler 2006; Sharaf 2006). For details of geographical distribution see Sharaf *et al.* (2018b). Bolton (1987) commented on the variability in color, “from clear yellow to dark brown”, and felt the name as then understood concealed more than one valid species. Heterick (2006) sought to clarify the situation by defining forms of varying color by defining lectotypes of earlier varietal names and synonymizing those names under *M. exiguum*. Our collection represents a new record for Dhofar.

*Monomorium floricola* (Jerdon, 1851)

Fig. 40

*Atta floricola* Jerdon, 1851: 107 (w) India. Indomalaya.

### Diagnosis

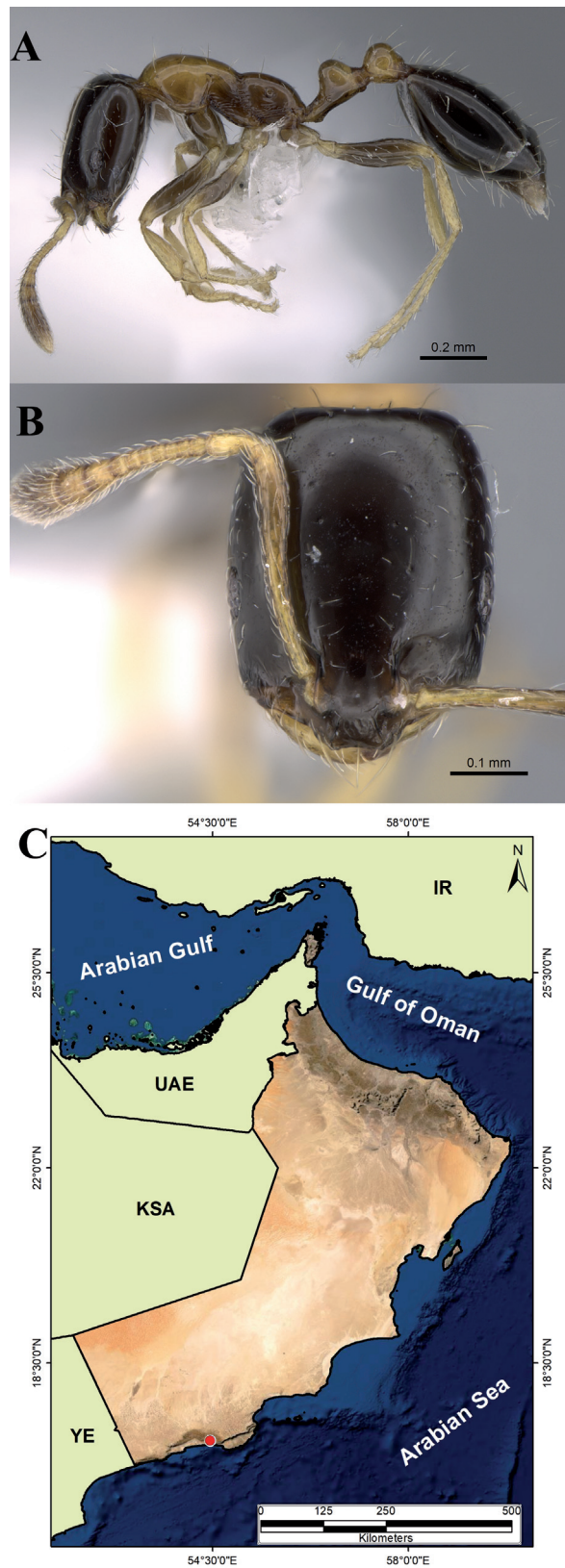
An easily recognizable species by color with head and gaster uniformly dark brown or black, mesosoma, petiole, and postpetiole clear yellow; the petiolar node low and broadly conical, little higher than postpetiole in profile; body surface unsculptured and glossy.

### Material examined

OMAN – Dhofar • 1 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

Workers were collected foraging in leaf litter under a tree of *Ziziphus* sp. Although the gynes of *M. floricola* are wingless apparently affecting colony dispersal, the species has successfully spread into the tropics and subtropics (Wetterer 2010b). This species can nest in tiny cavities in temperate regions where buildings, especially greenhouses, are heated. A ‘budding phenomenon’ is known for colonies of this species where large colonies divide into smaller colonies (Snelling 2005; Wetterer 2010b). In addition, colonies are polygynous and polydomous. These biological and ecological characteristics have apparently allowed *M. floricola* to successfully colonize new habitats world-wide.



**Fig. 40.** *Monomorium floricola* (Jerdon, 1851), worker (CASENT0922876, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Geographic range

It was originally described from India, but now is a successful pantropical tramp species known from the Afrotropical (Bolton 1987), the Malagasy (Heterick 2006), the Nearctic (Krombein *et al.* 1979), the Neotropical (Kempf 1972), and the Polynesian (Wilson & Taylor 1967) Regions. This species is a new record for Oman and the Arabian Peninsula.

*Monomorium niloticum* Emery, 1881

Fig. 41

*Monomorium niloticum* Emery, 1881b: 533 (w) Egypt. Palearctic.

### Diagnosis

Gaster dark contrasting with red head and mesosoma; first of three segments forming club being shorter than the second; head smooth with superficial sculpture; head in full-face view with eyes fail or just break head sides; metanotal groove steeply angled; mesosoma with several pairs of projecting setae. This species looks similar to *M. venustum* (Smith, 1858) that share color and body measurements but *M. venustum* can be separated by the lack of the mesosomal setae.

### Material examined

OMAN – **Dhofar** • 19 w; Dhalkout; 16.727° N, 53.249° E; alt. 623 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922859; CASC • 2 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

Workers of *M. niloticum* were found nesting in a moderately moist clay soil, while several workers were found foraging on a small shrub. Additional workers were collected nesting under a stone in dry soil rich in feces of domestic animals.

### Geographic range

This species was originally described from Egypt and is the most common species of *Monomorium* in the Arabian Peninsula, recorded from all countries (Collingwood 1985; Collingwood & Agosti 1996; Collingwood *et al.* 2011; Sharaf *et al.* 2018a) except Kuwait. It has been recorded from Israel (Vonshak & Ionescu-Hirsch 2009). This species was recorded in Dhofar by Collingwood (1985).

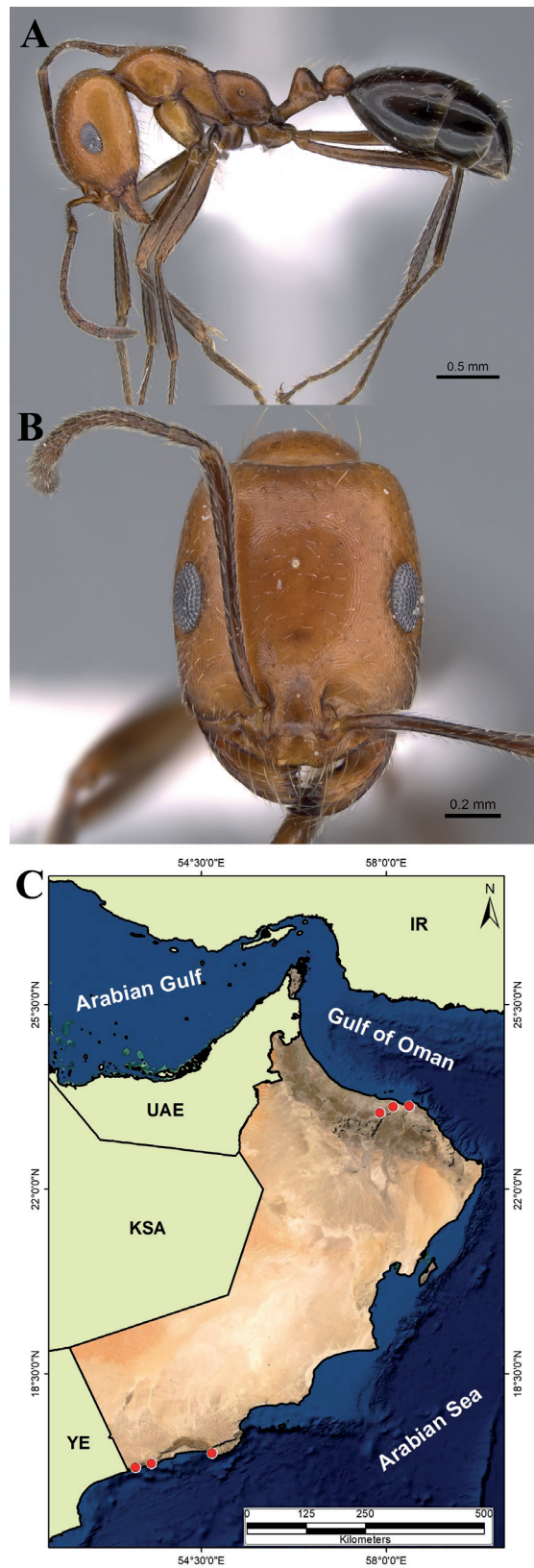
*Monomorium subopacum* (Smith, 1858)

Fig. 42

*Myrmica subopaca* Smith, 1858: 127 (w, q) Portugal (Madeira Is.). Afrotropic.

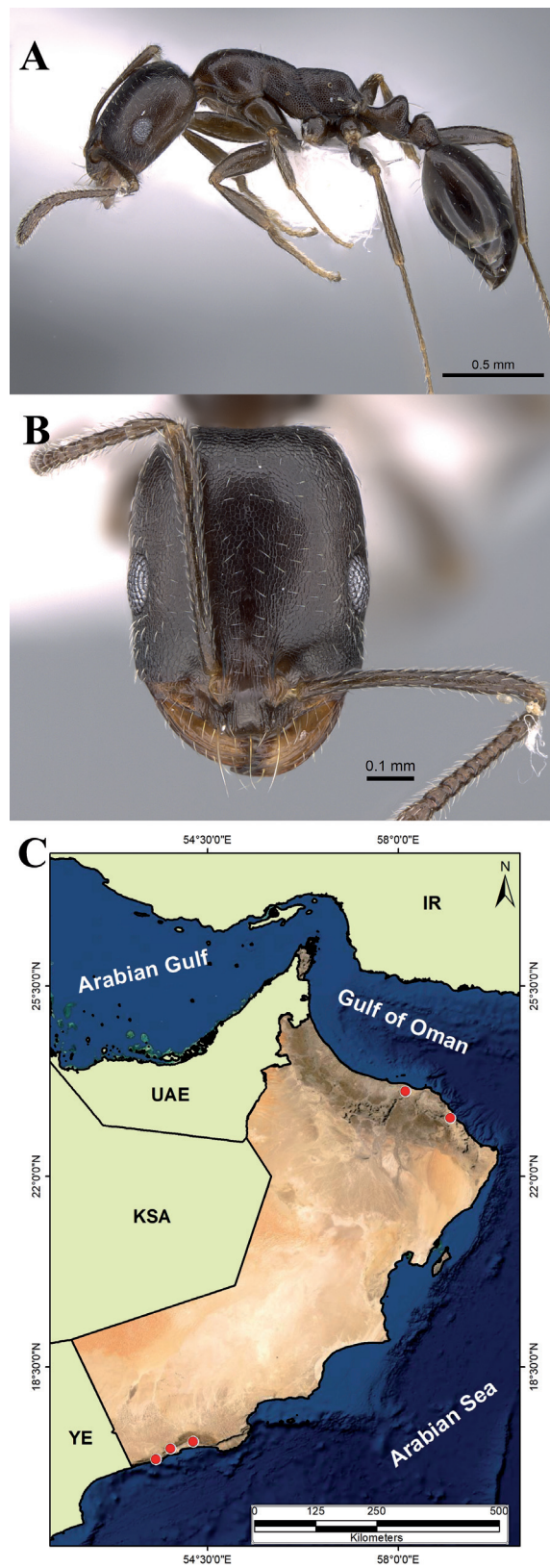
### Diagnosis

Color brown, gaster darker than head and mesosoma; eyes with 9–11 ommatidia in longest row; head densely and finely reticulate to reticulate-shagreenate; metanotal groove feebly impressed; mesosoma without standing setae; postpetiole with a single pair of backward directed hairs; dorsal cephalic surface reticulate-granulate to shagreenate-punctulate and without setae; petiole and postpetiole each with a single pair of setae.



**Fig. 41.** *Monomorium niloticum* Emery, 1881, worker (CASENT0922859, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 42.** *Monomorium subopacum* (Smith, 1858), worker (CASENT0922877, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Material examined

OMAN – Dhofar • 1 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; CASENT0922877; KSMA.

### Ecological and biological notes

This species was foraging on the ground under a tree of *Vachellia*.

### Geographic range

Originally described from Portugal, widely distributed in North Africa from Egypt to Morocco; also occurring in northern and eastern regions of the Mediterranean Basin and the Afrotropical Region (Bolton 1987). In the Arabian Peninsula, it has been recorded from Oman, Yemen (Collingwood & Agosti 1996), KSA (Collingwood 1985), and UAE (Collingwood *et al.* 2011). Our collection represents a new record for Dhofar.

### *Monomorium venustum* (Smith, 1858)

Fig. 43

*Myrmica venusta* Smith, 1858: 126 (w) Syria. Palearctic.

### Diagnosis

Differential diagnosis is given under *M. niloticum*.

### Material examined

This species was not collected during the present study.

### Ecological and biological notes

In KSA, this species has been collected foraging on the ground near plants and other native vegetation. Several workers were observed carrying plant seeds and dead insects.

### Geographic range

A species originally described from Syria and recorded from some countries in the Arabian Peninsula including Oman, KSA, Kuwait (Collingwood & Agosti 1996; Sharaf *et al.* 2015a). This species was recorded from Dhofar by Collingwood (1985) based on two workers. It closely resembles *M. niloticum* in size and color but has a considerably limited regional distribution.

### Genus *Nesomyrmex* Wheeler, 1910

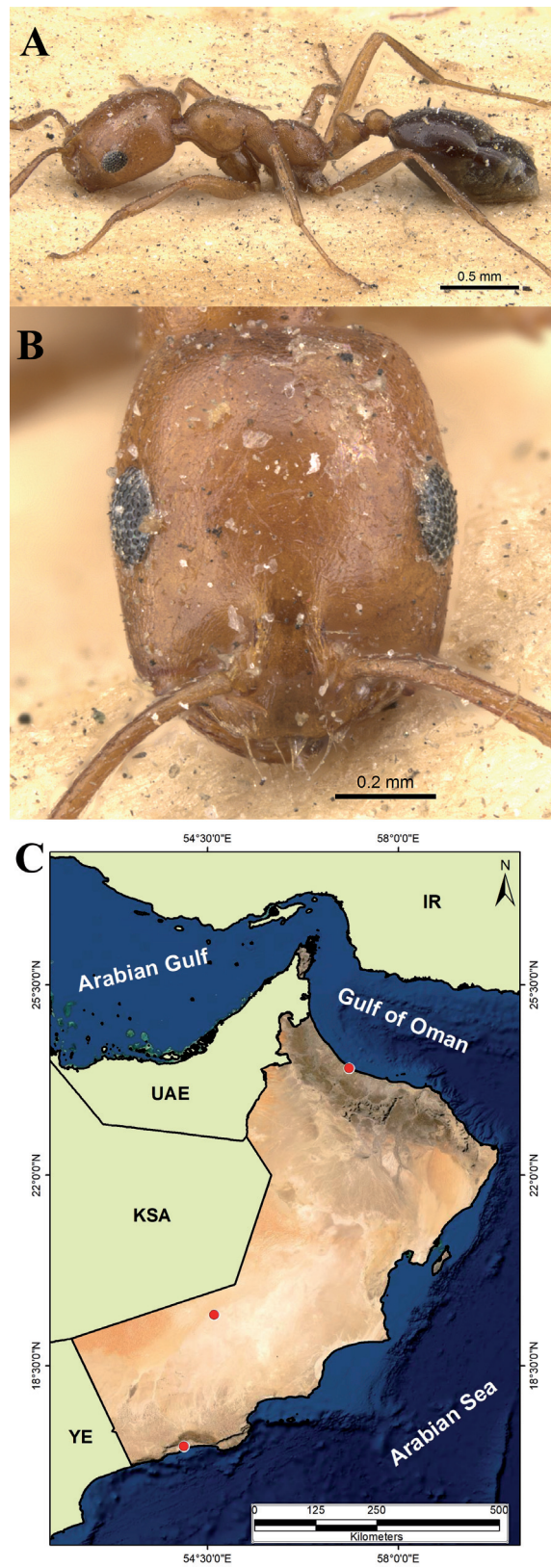
### *Nesomyrmex micheleae* Sharaf, 2020

Fig. 44

*Nesomyrmex micheleae* Sharaf, 2020 in Sharaf *et al.* 2020b: 335 (w) Oman. Afrotropic.

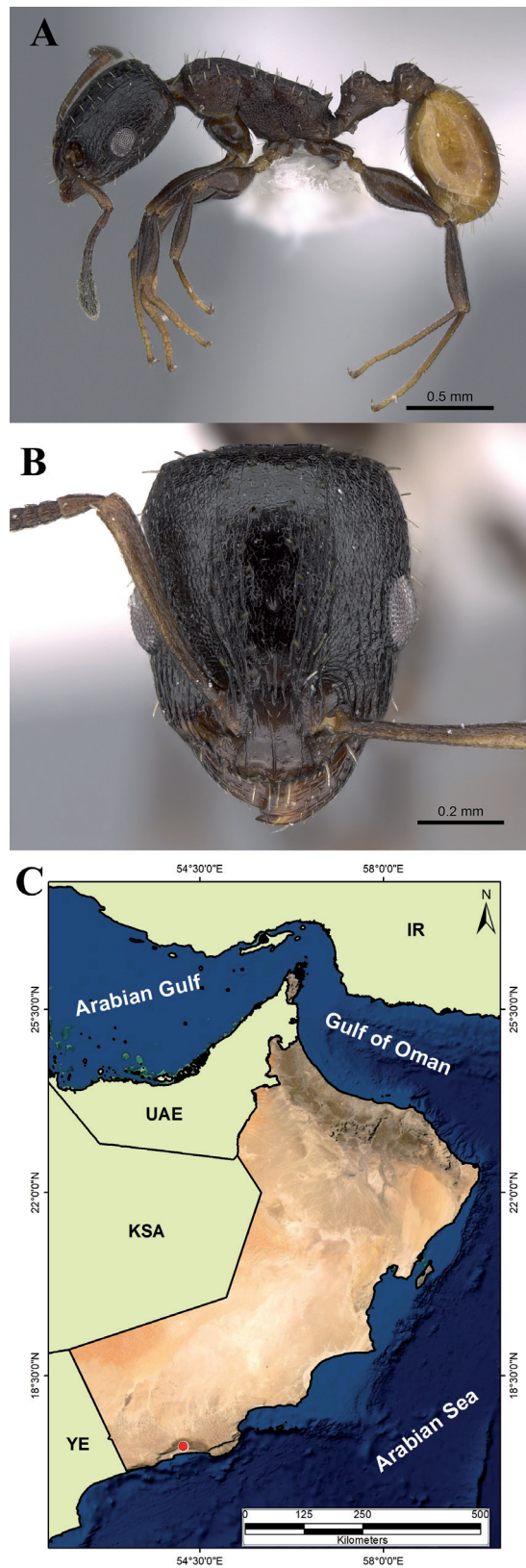
### Diagnosis

Bicolored species with head black-brown, mesosoma, petiole, postpetiole, and appendages brown, gaster golden yellow; median clypeal carina distinct; petiolar node nearly hexagonal from above; area in front of eyes and median cephalic surface irregularly, longitudinally rugulose; body covered with erect, blunt, stout, and moderately short setae.



**Fig. 43.** *Monomorium venustum* (Smith, 1858), syntype, worker (CASENT0902221, AntWeb.org (Will Ericson)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 44.** *Nesomyrmex micheleae* Sharaf, 2020, paratype, worker (CASENT0922872, AntWeb.org (Michele Esposito)) **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



### Material examined

OMAN – **Dhofar** • w, holotype; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 2 w, paratypes; same collection data as for holotype; CASENT0922872; KSMA.

### Ecological and biological notes

The three workers of *N. micheleae* were foraging on a large tree in Ayn Sahlanot of the Dhofar and collected using a beating sheet. Additional collecting in a broad range of habitats in Dhofar were not successful in finding additional material (Sharaf *et al.* 2020b).

### Geographic range

Known only from Oman.

Genus *Pheidole* Westwood, 1839

*Pheidole megacephala* (Fabricius, 1793)

Fig. 45

*Formica megacephala* Fabricius, 1793: 361 (s.) Mauritius (former Île de France). Malagasy.

### Diagnosis

#### Major worker

Head, mesosoma, petiole, and postpetiole brown, gaster black-brown. Head heart shaped, with deep emarginate posterior margin; cephalic surface with short-irregular longitudinal rugae anteriorly and sculpture absent from posterior two thirds of head; hypostomal margin without median process and with minute to inconspicuous submedian teeth; promesonotum smooth and shiny; mesosoma feebly punctate; katapisternum and lateropropodeum with superficial sculpture; postpetiole from above about 1.9× as broad as petiole.

### Material examined

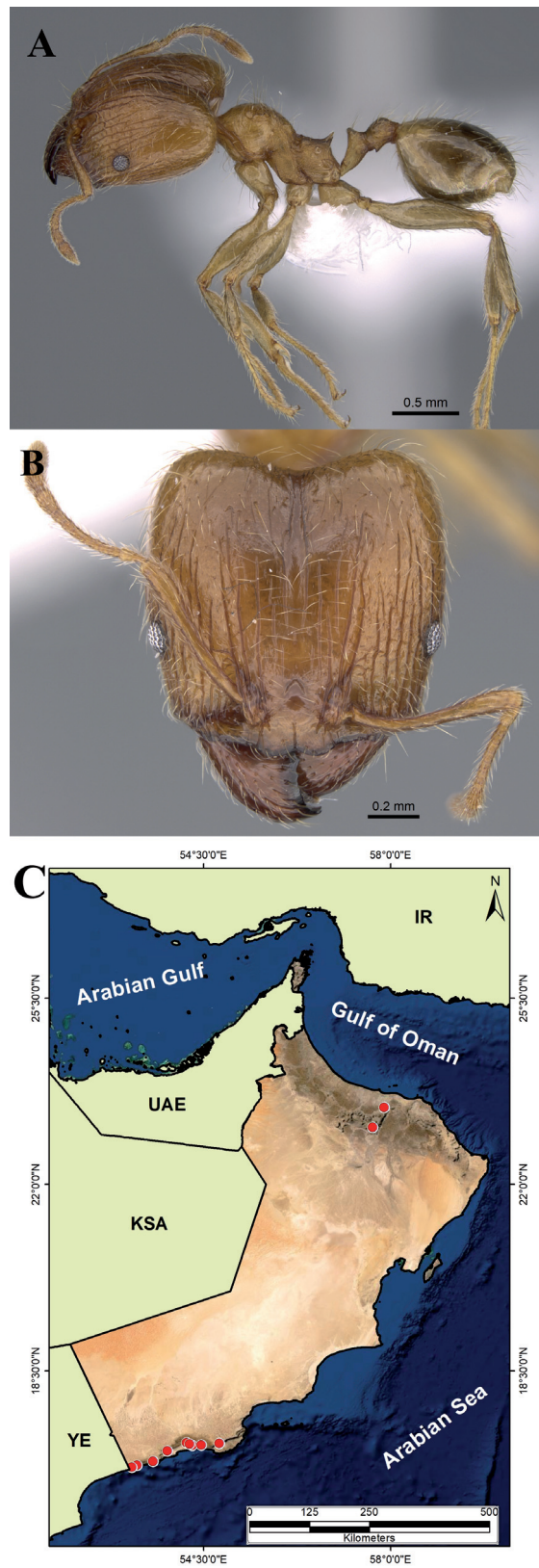
#### Holotype

MAURITIUS • Camizard Mt, Bambous; 20.3328° S, 57.723° E, 375 m a.s.l.; 27 May 2005; B.L. Fisher *et al.* leg.; rainforest, ex rotten log; BLF12051; CASENT0104990 (CASC).

OMAN – **Dhofar** • 2 s, 2 mw; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 12 s, 37 mw; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 s; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF, SW; M.R. Sharaf leg.; KSMA • 8 s, 13 mw; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 7 mw; Dhalkout; 16.727° N, 53.249° E; alt. 623 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 s, 2 mw; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 4 mw; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 mw; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

This species nests in soil, under stones, and is frequently associated with leaf litter. Majority of specimens were collected during this study near trees of *Vachellia*.



**Fig. 45.** *Pheidole megacephala* (Fabricius, 1793), major worker (CASENT0922894, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Geographic range

The type location of *Pheidole megacephala* was not precise, but generally is accepted as from Mauritius. It, however, is widely spread world-wide (Sarnat *et al.* 2015). It has been recorded from Oman, KSA, Kuwait, Yemen (Collingwood & Agosti 1996), and UAE (Collingwood *et al.* 2011). This species is recorded for the first time in Dhofar.

*Pheidole sculpturata* Mayr, 1866

Fig. 46

*Pheidole sculpturata* Mayr, 1866: 897 (s) South Africa. Afrotropic.

### Diagnosis

#### Major worker

Head deeply emarginate in full-face view; cephalic surface densely reticulate-rugulose except for longitudinal rugae located between frontal carinae; metanotal groove deeply impressed; propodeal spines acute and upward directed; postpetiole seen from above about twice as broad as long, distinctly and acutely dentate at widest point; whole dorsum covered with dense fine pale pilosity.

### Material examined

OMAN – **Dhofar** • 2 s, 4 mw; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

This species was found nesting under a rock in dry loose soil next to small shrubs.

### Geographic range

*Pheidole sculpturata* was originally described from South Africa and is widely distributed in the Afrotropical Region (Collingwood 1985). It has been recorded from KSA (Collingwood 1985), Oman, Yemen (Collingwood & Agosti 1996), and UAE (Collingwood *et al.* 2011). This species is recorded for the first time in Dhofar.

Genus *Strumigenys* Smith, 1860

*Strumigenys membranifera* Emery, 1869

Fig. 47

*Strumigenys (Trichoscapa) membranifera* Emery, 1869: 24 (w) Italy. Palearctic.

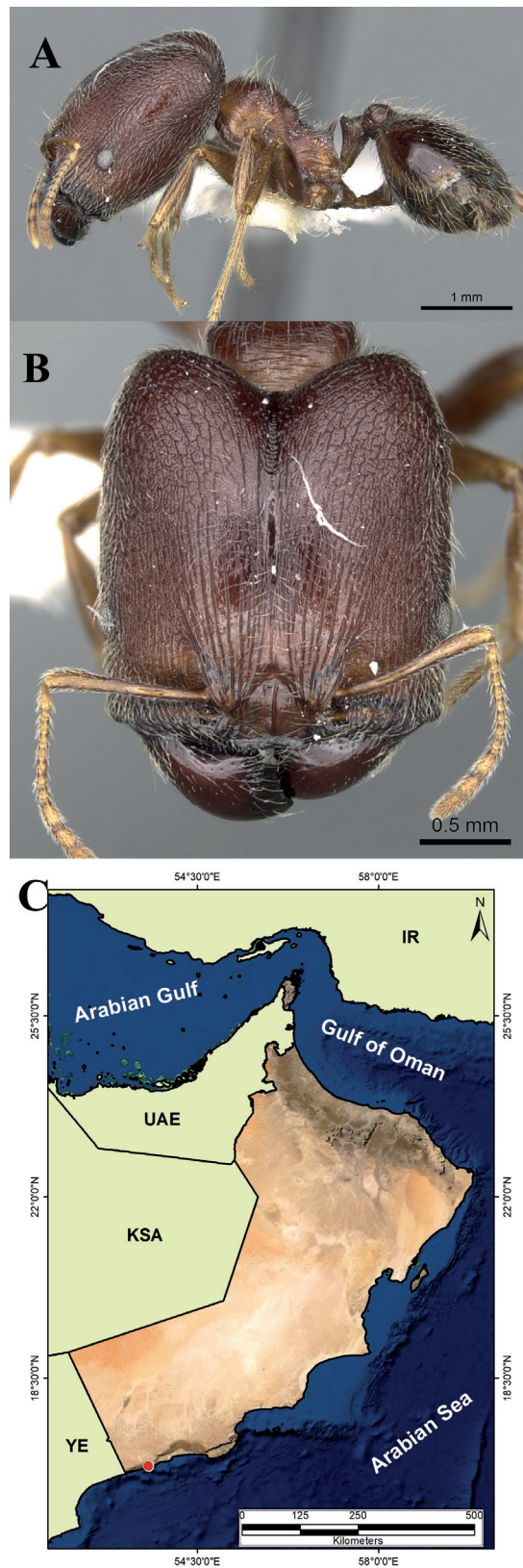
### Diagnosis

Dull yellow to yellow-brown; mandibles with 12 teeth, arranged in a series of 7 larger teeth basally followed by 4 denticles and a small terminal tooth; eyes minute, with few ommatidia, situated ventrally on antennal scrobes; metanotal groove absent; in profile, spongiform appendages of petiole and postpetiole well-developed; cephalic pilosity restricted to one pair of setae; cephalic dorsum with appressed pubescence; mesosomal dorsum with scattered minute appressed pubescence; cephalic dorsum reticulate-punctate and dull; sides of mesosoma and propodeal dorsum and declivity smooth (Fig. 47).

### Material examined

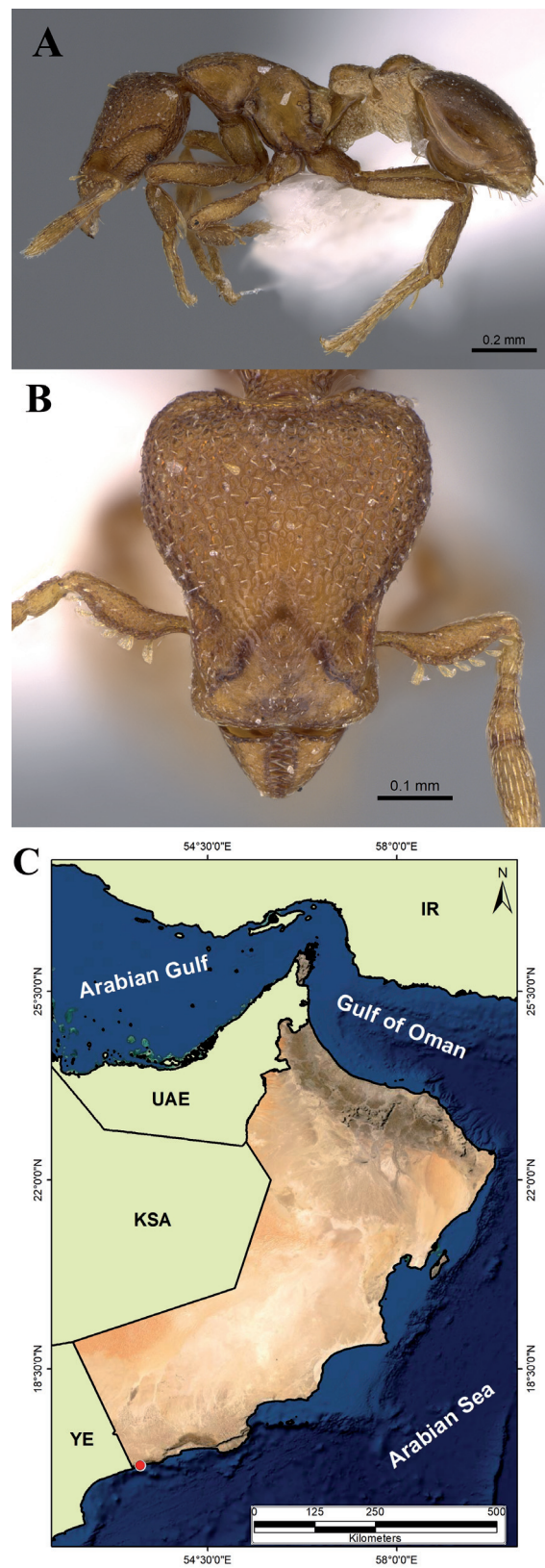
#### Syntype

ITALY • Portici; 24 Sep. 1867; CASENT0102081; MSNG.



**Fig. 46.** *Pheidole sculpturata* Mayr, 1866, major worker (CASENT0281616, AntWeb.org (Shannon Hartman)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 47.** *Strumigenys membranifera* Emery, 1869, worker (CASENT0922883, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

#### **Additional material**

OMAN – Dhofar • 1 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

#### **Ecological and biological notes**

*Strumigenys membranifera* was collected from leaf litter in a shaded area in Dhalkout Forest where the soil was moist, and grasses and shrubs were abundant.

#### **Geographic range**

A pantropical species, originally described from Italy, this is a tramp species widespread outside the tropics (Brown & Wilson 1959; Bolton 1983, 2000; Wetterer 2011). The first record from the Arabian Peninsula was from UAE (Bolton 2000) and later this species was reported from KSA and Qatar (Sharaf *et al.* 2014, 2015b). The genus and species are recorded for the first time from Oman.

Genus *Tetramorium* Mayr, 1855

*Tetramorium caldarium* (Roger, 1857)

Fig. 48

*Tetragmus caldarius* Roger, 1857: 12 (w, q) Germany. Palearctic.

#### **Diagnosis**

Color yellow or yellow-brown, gaster brown or black-brown; frontal carinae distinct, running posteriorly behind level of eyes; antennal scrobes less-marked; eyes with seven to eight ommatidia in longest row; propodeal spines acute, small, and triangular; cephalic dorsum feebly and finely longitudinally rugulose; body setae stout, blunt, and short.

#### **Material examined**

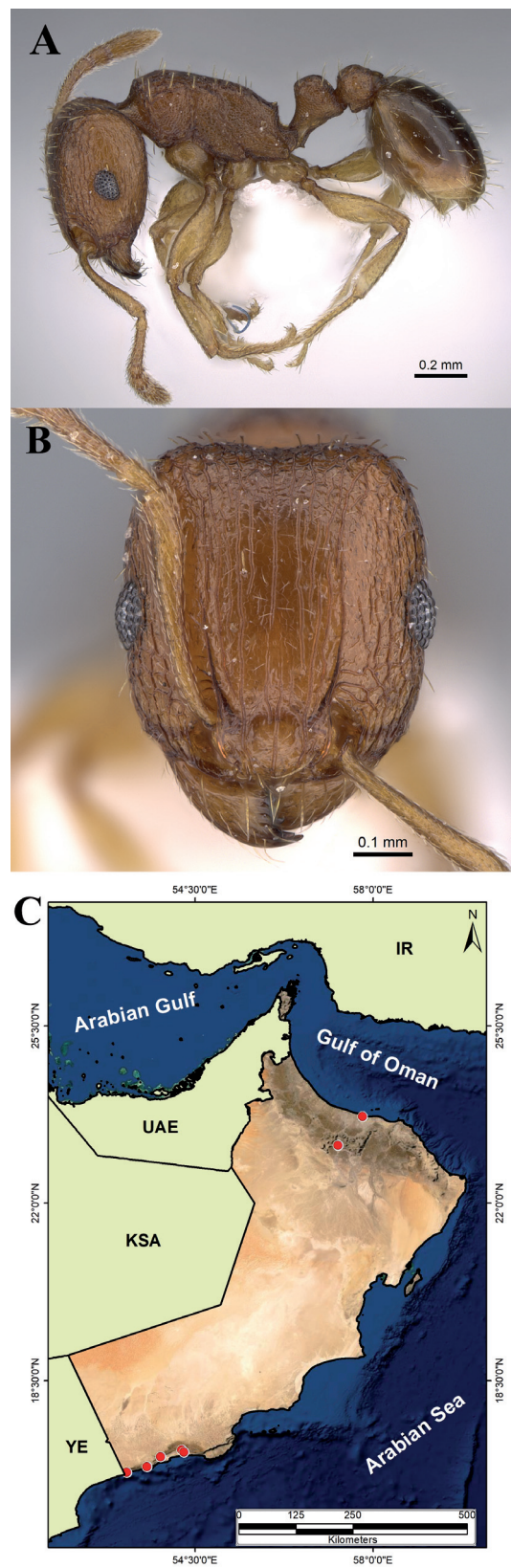
OMAN – Dhofar • 4 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Ayn Ashat; 16.998° N; 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 9 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922858; CASC.

#### **Ecological and biological notes**

The nesting habits of *T. caldarium* include soil, leaf litter or under stones where soil is rich in organic matter such as feces of domestic animals (camels). The species was collected from several sites near trees of *Ziziphus*. Several workers feigned death when disturbed.

#### **Geographic range**

*Tetramorium caldarium* was originally described from Poland and with a speculated African origin (Bolton 1980). The species has a wide global distribution (Wetterer & Hita Garcia 2015). It has been recorded from several countries in the Arabian Peninsula including Oman (Sharaf *et al.* 2018a), KSA, Yemen (Collingwood 1985; Collingwood & Agosti 1996), and the Socotra Archipelago (Collingwood *et al.* 2004; Sharaf *et al.* 2017c). *Tetramorium caldarium* is reported for the first time in Dhofar.



**Fig. 48.** *Tetramorium caldarium* (Roger, 1857), worker (CASENT0922858, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

*Tetramorium lanuginosum* Mayr, 1870

Fig. 49

*Tetramorium lanuginosum* Mayr, 1870: 976 (w) Indonesia (Java). Indomalaya.

**Diagnosis**

Color ranges from light brown to dark brown, gaster darker than body; anterior clypeal margin with small median notch; cephalic surface strongly reticulate-rugose; eyes with 8–10 ommatidia in longest row; frontal carinae well-marked; antennal scrobes well-defined; mesosoma convex in profile; metanotal groove indistinct; propodeal spines long and sharp; gaster smooth and shiny; body hairs long and profuse, bifid and simple.

**Material examined**

**Holotype**

INDONESIA • Java, Batavia; CASENT0235202; NHMW.

**Additional material**

OMAN – **Dhofar** • 1 w; Dhalkout, 16.727° N, 53.249° E; alt. 623 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 5 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Salalah; 17.019° N, 54.065° E; alt. 9 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 5 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922857; CASC • 1 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 11 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

**Ecological and biological notes**

The diverse nesting and feeding habits presumably has allowed a successful worldwide distribution. Nests are built in moist soil under stones, in leaf litter (Sharaf *et al.* 2018a), under trunks of dead palm trees, and in soil that is rich in organic matter (Sharaf *et al.* 2017c). In Dhofar, workers are foraging on ground in a shaded area with dense plant cover of grasses and shrubs.

**Geographic range**

It is a successful tramp species, originally described from Indonesia which has widely dispersed into tropical and subtropical regions (Bolton 1976; Wetterer 2010a; Hita Garcia & Fisher 2011; Agavekar *et al.* 2017). It has been previously collected from Oman (Sharaf *et al.* 2018a), KSA (Collingwood & Agosti 1996), the Socotra Archipelago (Collingwood *et al.* 2004; Sharaf *et al.* 2017c), Egypt (Sharaf 2006), and Palestine (Vonshak & Ionescu-Hirsch 2009). This species is recorded for the first time in Dhofar.

*Tetramorium sericeiventre* Emery, 1877

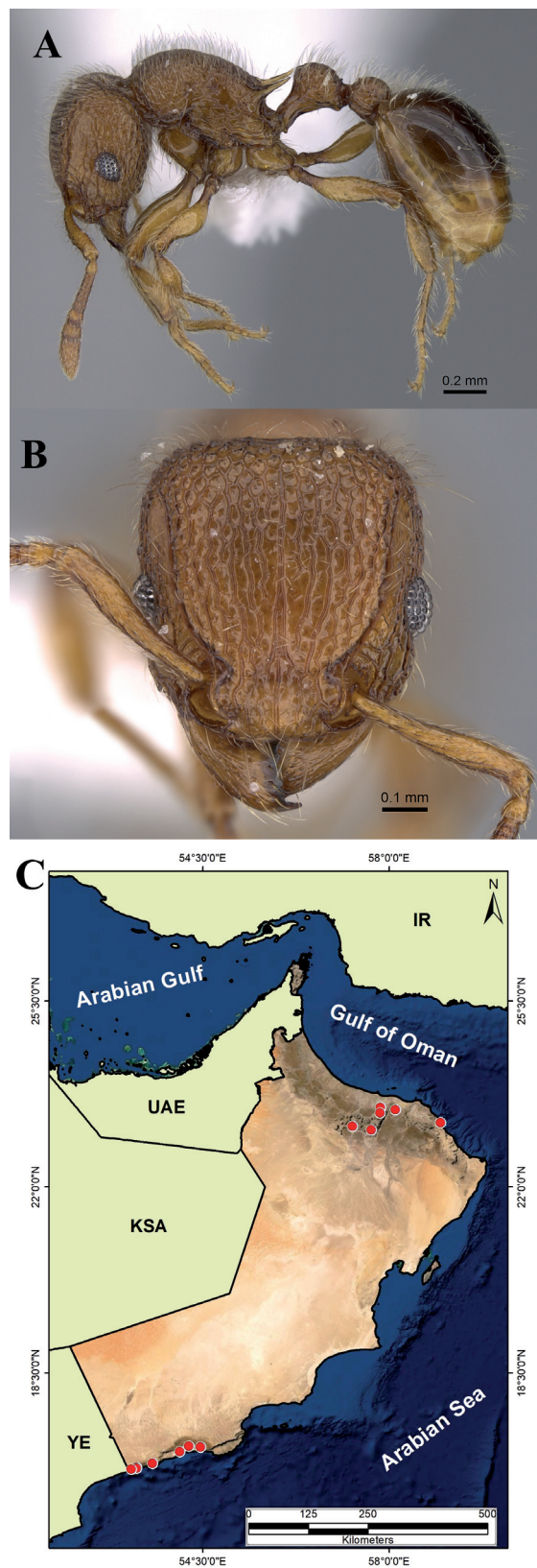
Fig. 50

*Tetramorium sericeiventre* Emery, 1877: 370 (w) Eritrea. Afrotropic.

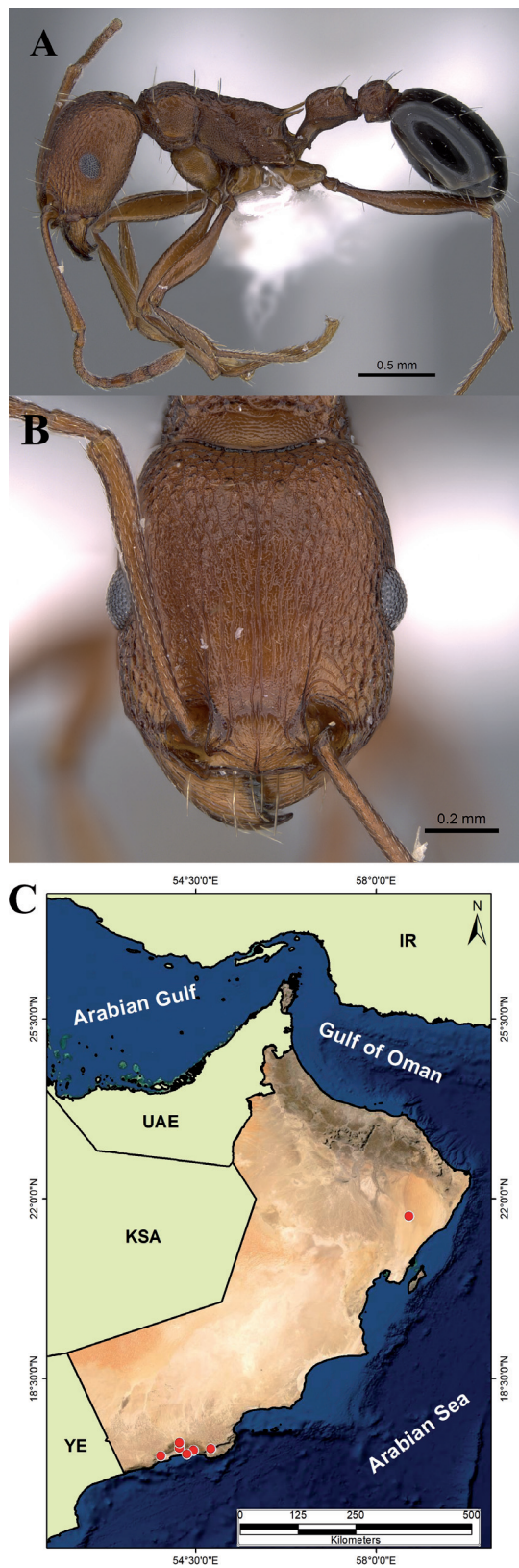
**Diagnosis**

Color red-brown to brown, or dark brown, gaster darker than body; frontal carinae shallowly developed; propodeal spines acute; metanotal groove indistinct; propodeal lobes long, of same length as propodeal spines; in profile petiolar nodes rectangular; cephalic surface, mesosoma, petiole, postpetiole, and gaster with sparse and stout standing hairs, propodeum bare.





**Fig. 49.** *Tetramorium lanuginosum* Mayr, 1870, worker (CASENT0922857, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



**Fig. 50.** *Tetramorium sericeiventris* Emery, 1877. worker (CASENT0922884, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

### Material examined

#### Syntype

ERITREA • Bogos Sciotel; O. Beccari leg.; MHNG.

#### Additional material

OMAN – Dhofar • 1 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922884; CASC • 9 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

This species nests in soil under stones or in leaf litter (Bolton 1980). It is abundant in areas where *Vachellia* and *Calotropis procera* (Aiton) W.T.Aiton (Apocynaceae Juss.) plants occur (Sharaf *et al.* 2013). Workers are predators on other ants (Lévieux 1972). This species is basically found wherever it is comparatively hot and there is sandy soil and no closed canopy (Bolton 1980). This explains the broad geographic distribution in the vast areas of the Arabian deserts.

### Geographic range

Originally described from Eritrea, it is known from the Afrotropical, the Malagasy, and the Southern Palaearctic Regions (Hita Garcia & Fisher 2011). Sharaf *et al.* (2013) pointed out the remarkable wide geographic distribution of this species in the Arabian Peninsula, as previously mentioned by Collingwood (1985), Collingwood & Agosti (1996), and Collingwood *et al.* (2011). This species is recorded for the first time in Dhofar.

Genus *Trichomyrmex* Mayr, 1865

*Trichomyrmex mayri* (Forel, 1902)

Fig. 51

*Monomorium* (*Parholcomyrmex*) *gracillimum* var. *mayri* Forel, 1902: 209 (w) India. Indomalaya, lectotype worker, CASENT0249904 (MHNG).

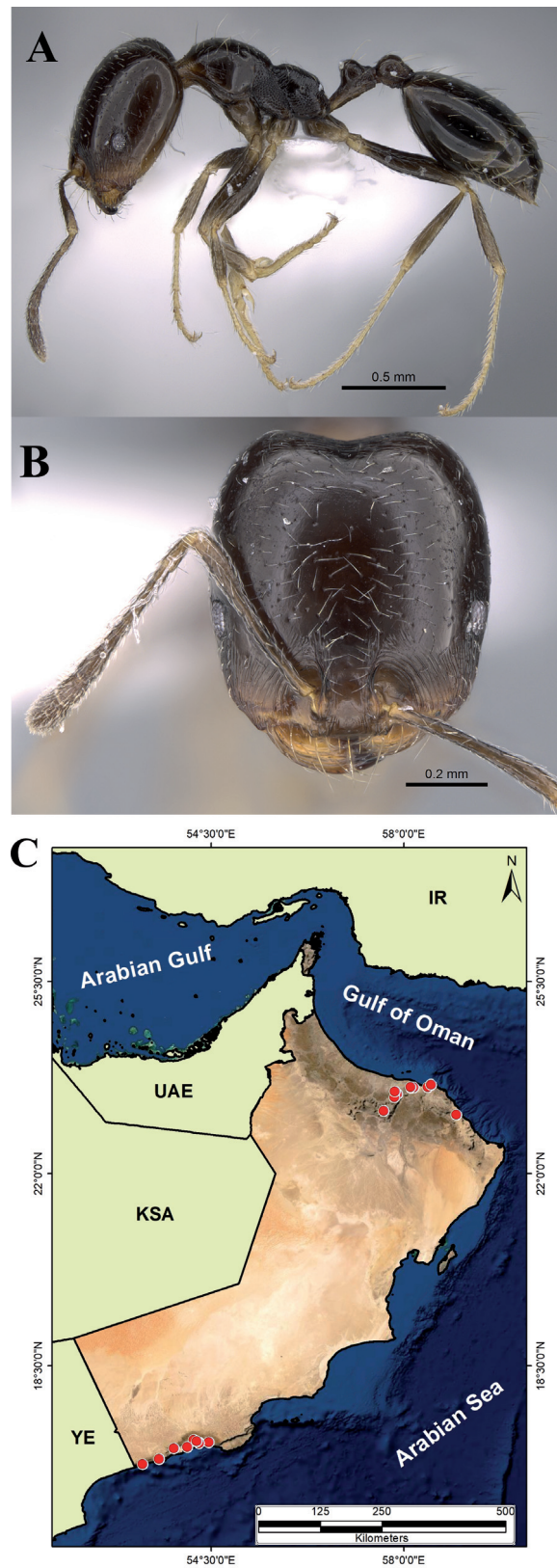
### Diagnosis

Unicolorous dark brown or black-brown; posterior margin of head transversely striolate; promesonotum in profile nearly flat or weakly convex; propodeal dorsum with transverse fine and dense sculpture. *Trichomyrmex mayri* looks similar to *T. destructor* (Jerdon, 1851), from which it can be separated only by the unicolorous body; *T. destructor* has head, mesosoma, petiole, and postpetiole yellow to brown yellow, gaster dark brown.

### Material examined

OMAN – Dhofar • 9 w; Ayn Sahlanot; 17.147° N, 54.180° E; alt. 134 m; 16 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 9 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 17 w; Ayn Sahlanot; 17.148° N, 54.179° E; alt. 151 m; 16 Nov. 2017; SW; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922869; CASC • 4 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 9 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 2 w; Salalah; 17.019° N, 54.065° E; alt. 9 m; 18 Nov. 2017; BS; M.R. Sharaf leg.; KSMA • 2 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 21 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 6 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 14 w; Ayn





**Fig. 51.** *Trichomyrmex mayri* (Forel, 1902), worker (CASENT0922869, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.



Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 6 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; BS; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

This species has diverse nesting habits that include soil, under stones, in leaf litter, under barks, and in rotten wood and fruits (Sharaf *et al.* 2016b, 2017c, 2018a) which may explain the wide geographical distribution in the Arabian Peninsula. This species is often found in areas with the following plants species: *Citrus limon* (L.) Osbeck (Rutaceae Juss.), mango tree, *Mangifera indica* L. (Anacardiaceae R.Br.), *Myoporum insulare* R.Br. (Scrophulariaceae Juss.), *Juniperus procera* Hochst. ex Endl. (Cupressaceae Gray), *Psidium guajava* L. (Myrtaceae Juss.), *Coffea arabica* L. (Rubiaceae Juss.), *Eragrostis* Wolf. (Poaceae Barnhart), *Cochlianthus caracalla* (L.) Trew (Fabaceae), *Boswellia sacra* Flück. (Burseraceae Kunth), date palm, *Phoenix dactylifera* L. (Arecaceae Bercht. & J.Presl), and *Vachellia* sp. (Sharaf *et al.* 2016b, 2017c, 2018a).

### Geographic range

*Trichomyrmex mayri* was originally described from India and has widely been introduced or dispersed into several countries in the Palearctic (Sharaf *et al.* 2016b) and the Afrotropical (Bolton 1987) Regions. The species has been previously recorded from the Arabian Peninsula (Collingwood 1985; Collingwood & Agosti 1996; Sharaf *et al.* 2013, 2016b), the Socotra Archipelago (Collingwood *et al.* 2004; Sharaf *et al.* 2017c), Egypt (Sharaf 2006), and Palestine (Vonshak & Ionescu-Hirsch 2009). This species was collected in Dhofar by Collingwood (1985).

Subfamily Ponerinae Lepeletier, 1835

Genus *Anochetus* Mayr, 1861

*Anochetus sedilloti* Emery, 1884

Fig. 52

*Anochetus sedilloti* Emery, 1884: 377 (w) Tunisia. Palearctic.

### Diagnosis

Head, mandibles, antennae, and legs orange, mesosoma and petiole red, gaster dark brown; mandibles long and straight, inserted in middle of front margin of head; posterior margin of head deeply emarginate; eyes rounded, relatively large with about 25 ommatidia in longest row; scapes when laid back from their insertions reach median part of posterior margin of head; metanotal groove feeble; propodeal dorsum about 1.53 of declivity length, both making an obtuse angle in profile.

### Material examined

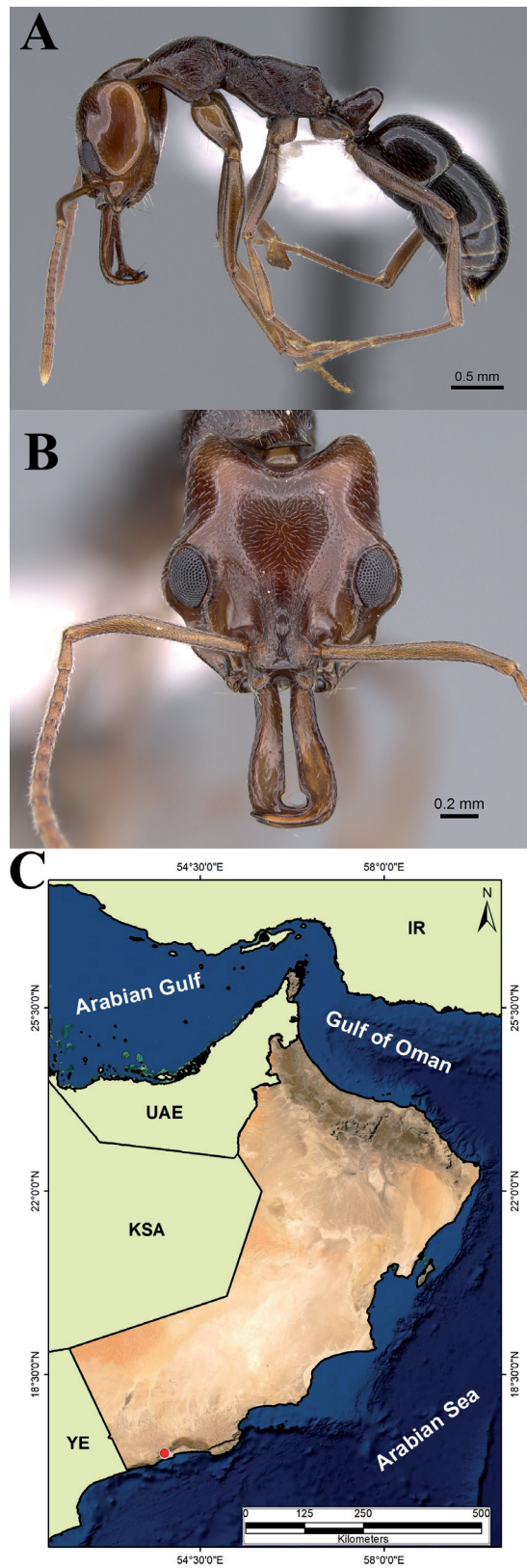
OMAN – Dhofar • 2 w; Ayn Ashat; 16.998° N, 53.820° E; alt. 202 m; 21 Nov. 2017; HP; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

Two workers were collected foraging on the ground immediately after sunset. In the Asir Mountains, a single worker was observed by Collingwood (1985) foraging on ground in the early morning. Nothing is specifically known regarding the ecology of this species

### Geographic range

*Anochetus sedilloti* was originally described from Tunisia and has been recorded from KSA, India, and North Africa (Collingwood 1985). It is widespread in the Sahel area of Africa (Taylor *et al.* 2016; Diame *et al.* 2017). The genus is first recorded from Oman by the new species *Anochetus annetteae* Sharaf, 2017. Our collections represent a new species record for Oman.



**Fig. 52.** *Anochetus sedilloti* Emery, 1884, worker (CASENT0922865, AntWeb.org (Michele Esposito)).  
A. Body in profile. B. Head in full-face view. C. Distribution map.

Genus *Brachyponera* Emery, 1900

*Brachyponera sennaarensis* (Mayr, 1862)

Fig. 53

*Ponera sennaarensis* Mayr, 1862: 721 (w) Sudan. Afrotropic.

### Diagnosis

Body dark brown to black-brown, tibiae, antennae, and tarsi red; head broader than mesosoma; metanotal groove well-impressed; petiolar node high and thick; first and second gastral tergites separated by a distinct constriction; sting powerful; body surfaces covered with dense pubescence.

### Material examined

OMAN – **Dhofar** • 5 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 5 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 6 m; 22 Nov. 2017; M.R. Sharaf leg.; KSMA • 2 w; Ayn Razat; 17.130° N, 54.236° E; alt. 121 m; 20 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 6 w; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922868; CASC • 5 w; Dhalkout; 16.705° N, 53.24453° E; alt. 43 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 5 w; Ayn Dirbat; 17.106° N, 54.453° E; alt. 207 m; 17 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 6 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Hamran; 17.100° N, 54.284° E; alt. 106 m; 20 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 3 w; Salalah; 17.019° N, 54.065° E; alt. 9 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA • 1 w; Dhalkout Road, Aghbaroot Village; 16.798° N, 53.554° E; alt. 1034 m; 18 Nov. 2017; HP; M.R. Sharaf leg.; KSMA.

### Ecological and biological notes

*Brachyponera sennaarensis* inhabits a wide range of habitats in the Arabian Peninsula, associated with moist soil and leaf litter around date palm trees, under rocks, logs, or beneath debris near human settlements, in manicured parks, backyards of homes and agricultural production areas (Collingwood 1985; Collingwood & Agosti 1996; Sharaf *et al.* 2017c, 2018a). The species is generalized forager, feeding on seeds or on other ants (Dejean & Lachaud 1994).

### Geographic range

A species described originally from Sudan, *B. sennaarensis* is widely distributed throughout Africa and the Middle East, including the Arabian Peninsula (Collingwood 1985; Collingwood & Agosti 1996; Collingwood *et al.* 2011) and the Socotra Archipelago (Sharaf *et al.* 2017c). *Brachyponera sennaarensis* was collected in Dhofar by Collingwood (1985).

Genus *Hypoconera* Santschi, 1938

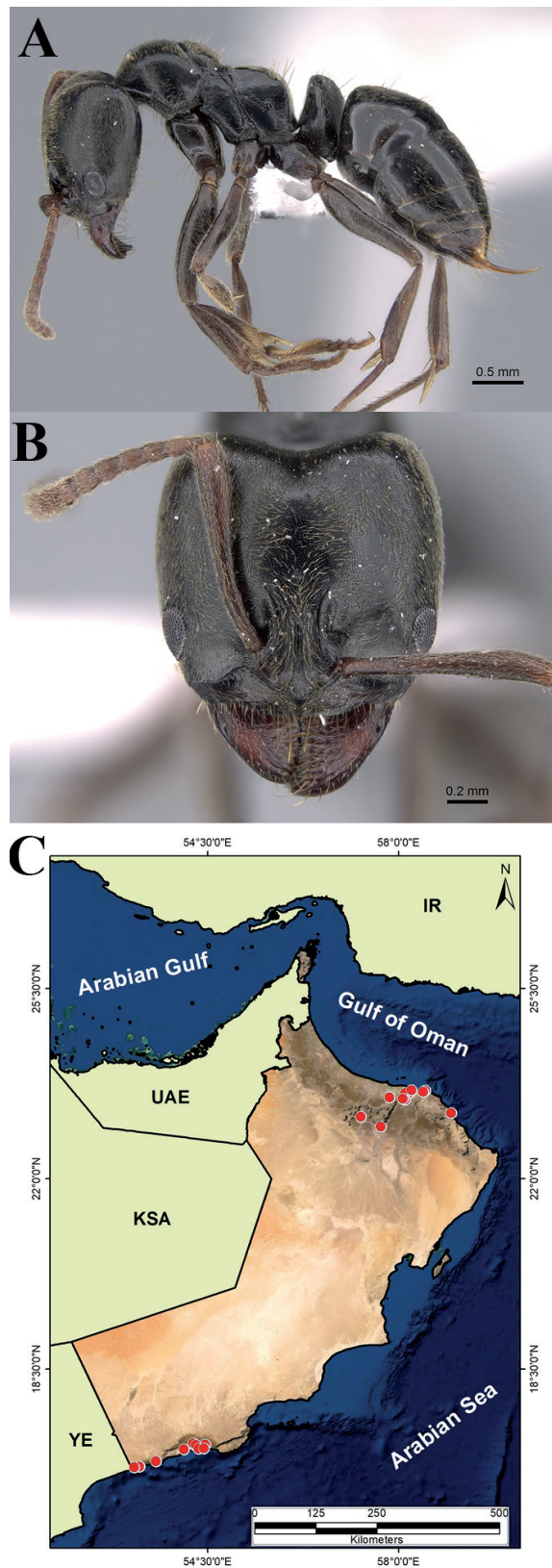
*Hypoconera ragusai* (Emery, 1894)

Fig. 54

*Ponera ragusai* Emery, 1894: 28 (w) Italy (Sicily). Palearctic.

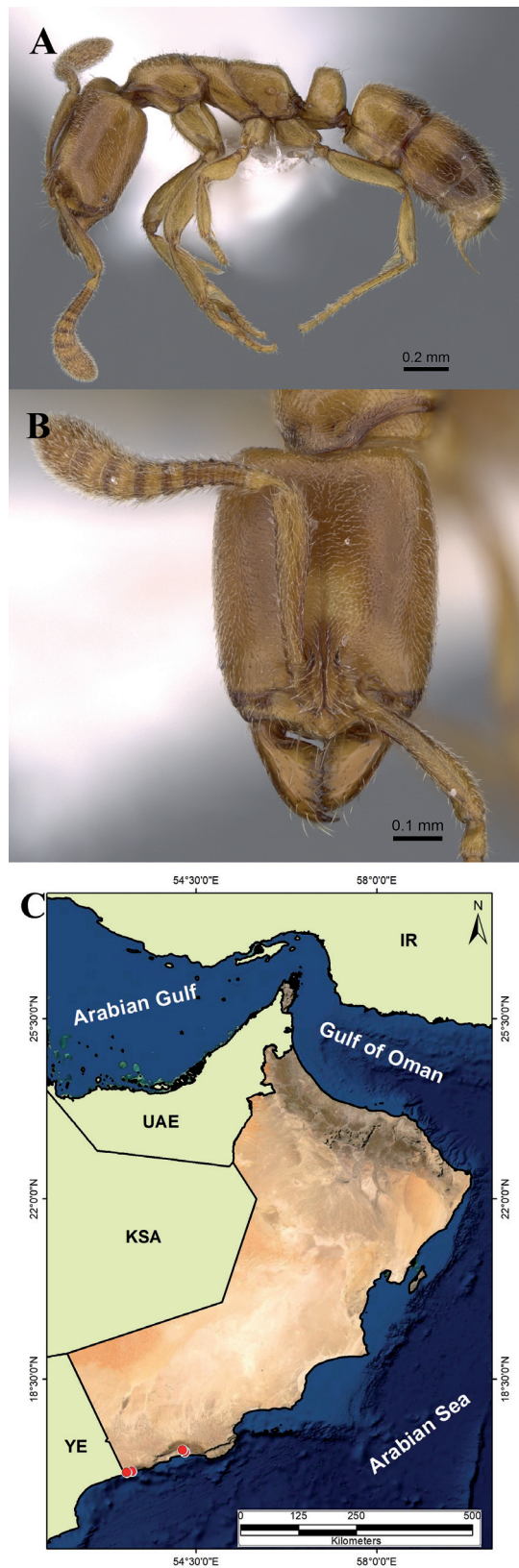
### Diagnosis

Color yellow to light brown-yellow; scapes in full-face view fail to reach posterior margin of head; eyes minute of 1–3 facets, situated near to posterior margin of clypeus; petiole thick, 1.5 times as broad as long; subpetiolar process subtriangular.



**Fig. 53.** *Brachyponera sennaarensis* (Mayr, 1862), worker (CASENT0922868, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.





**Fig. 54.** *Hypoponera ragusai* (Emery, 1894), worker (CASENT0922863, AntWeb.org (Michele Esposito)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

**Material examined**

OMAN – Dhofar • 15 w, 1 m; Dhalkout; 16.707° N, 53.251° E; alt. 34 m; 19 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; same collection data as for preceding; CASENT0922863; CASC • 6 w; Ayn Hamran; 17.086° N, 54.280° E; alt. 56 m; 22 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Ayn Razat; 17.124° N, 54.238° E; alt. 98 m; 20 Nov. 2017; SF; M.R. Sharaf leg.; KSMA • 1 w; Dhalkout; 16.693° N, 53.156° E; alt. 628 m; 18 Nov. 2017; SF; M.R. Sharaf leg.; KSMA.

**Ecological and biological notes**

Workers were collected in a shaded area with dense native grasses and shrubs, whereas several specimens were found nesting in moist soil under stones. A nest series was found also in leaf litter under a tree of *Ziziphus* sp.

**Geographic range**

Although originally described from Italy, *H. ragusai* has spread worldwide into all zoogeographical regions (Bolton & Fisher 2011; Bharti *et al.* 2015). In the Arabian Peninsula, *H. ragusai* has been collected from KSA (Collingwood 1985), and UAE (Collingwood *et al.* 2011). The above specimens represent the first species record for Oman.

Genus *Leptogenys* Roger, 1861

*Leptogenys maxillosa* (Smith, 1858)

Fig. 55

*Ponera maxillosa* Smith, 1858: 93 (w, m) Mauritius. Malagasy.

**Diagnosis**

Body opaque dark brown to black-brown; in full-face view hypostomal teeth visible, anterior clypeal margin makes an obtuse angle medially; anterior clypeal margin with 2 long setae; mandibles falcate; median portion of clypeus projects as a lobe; tarsal claws pectinate.

**Material examined**

This species was not collected in the present study.

**Ecological and biological notes**

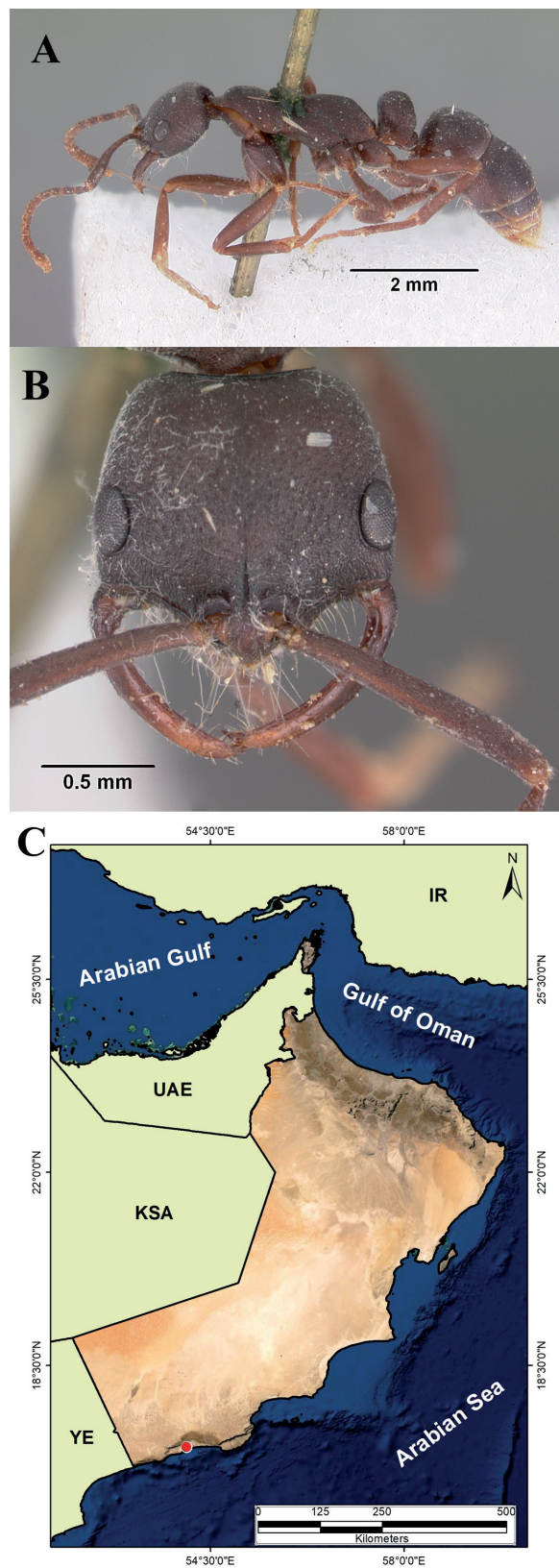
This species has been found associated with roadside leaf litter under shrubs (Collingwood 1985). *Leptogenys maxillosa* has been reported as a specialized predator of isopods in Brazil (Lattke 2011), and nest entrances can be detected by exoskeletons of their prey (Freitas 1995). *Leptogenys maxillosa* is a pantropical tramp species adapted to inhabiting disturbed areas, and frequently found nesting in slots and cavities of buildings in urban areas (Freitas 1995).

**Geographic range**

*Leptogenys maxillosa* was described originally from Mauritius and this ant is now recorded from the Afrotropical, the Neotropical (Bolton 1975) and the Malagasy (Rakotonirina & Fisher 2014) Regions. It was listed from KSA and Oman (Dhofar) by Collingwood (1985) and Collingwood & Agosti (1996).

**Discussion**

With our new survey, we raise the number of known ant species in Dhofar from 21 to 53, and for Oman as a whole from 123 to 130 (see Appendix). We expect that there are still many ant species yet to be



**Fig. 55.** *Leptogenys maxillosa* (Smith, 1858), syntype, worker (CASENT0102266, AntWeb.org (April Nobile)). **A.** Body in profile. **B.** Head in full-face view. **C.** Distribution map.

found in Dhofar and Oman, through sampling additional habitats and using other methods such as pitfall traps, winkler extraction, baits, etc. An example of species missed in the current survey are species of *Cataglyphis*, commonly called desert ants. Although six species of *Cataglyphis* have been recorded from Dhofar (*C. adenensis*, *C. arenaria*, *C. isis*, *C. rubra*, *C. sabulosa*, and *C. urens*; Collingwood 1985; Collingwood & Agosti 1996), no *Cataglyphis* were collected during this study. The sampling methodology and the study sites were not well-suited for finding these fast-moving, generally desert-inhabiting ants, therefore, the use of pitfall traps in the inland desert areas is supposed to be useful to collect members of this genus.

Oman is situated at the confluence of three zoogeographical realms, the Afrotropical, the Palearctic, and the Indomalayan biogeographic realms, and harbors faunal elements of all three regions (Table 2; Guichard 1980; Larsen & Larsen 1980; Cowie 1989; Hausmann 2009). Our new collections and previous literature records indicate that 43% (23 species) of the known ant fauna of Dhofar is associated with the Afrotropical biogeographic realm. The remaining taxa are Palearctic (38%; 20 species), Indomalayan (8%; 4 species), and a single species from both the Malagasy and Neotropical Regions (1%). This Afrotropical preponderance has been documented in other taxa in Dhofar (Guichard 1980; Larsen & Larsen 1980; Cowie 1989; Waterston & Pittaway 1991; Schneider & Krupp 1993; Taiti *et al.* 2000; Weygoldt *et al.* 2002; Hausmann 2009; Polak & Verovnik 2009; Neubert & van Damme 2012; Ball 2014; Hájek & Reiter 2014; Sharaf & Aldawood 2019).

Dhofar, however, has a notable proportion of apparently endemic Omani species (9%) represented by five species: *Lepisiota dhofara*, *Lepisiota elbazi*, *Crematogaster jacindae*, *Meranoplus mosalahi*, and *Nesomyrmex micheleae*. Along with the Asir Mountains of southwestern KSA, Dhofar is one area of the Arabian Peninsula that has a high number of endemic taxa in various animal groups including amphibians (Arnold 1980), reptiles (Kooij 2001; Šmíd 2010; Melnikov & Pierson 2012), birds (Ball 2014; Ball *et al.* 2015), Isopoda (Taiti *et al.* 2000), Amblypygi (Weygoldt *et al.* 2002), Lepidoptera (Larsen & Larsen 1980; Hausmann 2009), Isoptera (Cowie 1989), Odonata (Waterston & Pittaway 1991; Schneider & Krupp 1993), Coleoptera (Hájek & Reiter 2014), and Hymenoptera (Collingwood & Agosti 1996; Pesenko & Pauly 2009; Sharaf & Aldawood 2019).

The great native biodiversity of Dhofar, however, is threatened by human activities (Mack *et al.* 2000), through habitat destruction (Rounaghi & Hosseinian 2018) and the introduction of invasive species (Clavero & García-Berthou 2005). Dhofar is one of the most important areas on the Arabian Peninsula regarding tourism. It is anticipated that the unique ecosystems will be impacted negatively by human activities and additional introductions of invasive species. Ten invasive non-native ant species are now known from Dhofar: *Tapinoma melanocephalum*, *Paratrechina longicornis*, *Cardiocondyla wroughtonii*, *Monomorium exiguum*, *M. floricola*, *Pheidole megacephala*, *Strumigenys membranifera*, *Tetramorium caldarium*, *T. lanuginosum*, and *Hypoponera ragusai*. The percentage of non-native species found in Dhofar compared to the total ant fauna is ~18%, which is a relatively high proportion. These species have adapted successfully to a wide range of habitats worldwide (Wetterer 2010a, 2012; Wetterer & Hita Garcia 2015), including countries of the Arabian Peninsula (Collingwood 1985; Collingwood & Agosti 1996; Collingwood *et al.* 2011; Sharaf *et al.* 2014, 2015b, 2017c, 2018a, 2018b).

For the ant fauna of Oman (Table 2) there is a prevalence of faunal elements from the Palearctic Region (68 species, 53%) followed by Afrotropical faunal elements (45 species, 34%), and five species, *C. maculatus*, *M. galla*, *T. sericeiventris*, *Tr. mayri*, and *B. sennaarensis*, are widely distributed throughout both the Palearctic and the Afrotropical Regions. Nine species (7%) are from the Indomalayan Region: *L. sericea* (Forel, 1892), *C. breviscapa* Seifert, 2003, *C. minutior* Forel, 1899, *C. wroughtonii* (Forel, 1890), *E. latinodis* (Mayr, 1872), *M. floricola* (Jerdon, 1851), *P. parva* Mayr, 1865, *T. lanuginosum* Mayr, 1870, and *Tr. destructor* (Jerdon, 1851). Two species from the Neotropical Region, *T. melanocephalum*



**Table 2.** Faunal analysis of Oman.

Bioregion	No of species/130	Percentage
Afrotropic	45	34%
Palaearctic	68	53%
Afrotropic & Palaearctic	5	4%
Indomalaya	9	7%
Malagasy	1	1%
Neotropic	2	2%

and *C. emeryi* (2%), and a single species *Ph. megacephala* (1%) from the Malagasy Region. The number of endemic species (15 species/12%) is relatively low compared to the large geographical area of Oman and the broad diversity of habitats that characterizes the country.

All of the non-native ant species now known from Dhofar tend to be most common in human-disturbed environments. This habitat preference enables successful invasions into urban habitats worldwide (Harada 1990; Wetterer *et al.* 1999; Wetterer 2009). Several of these species are known to severely impact native species in areas where they invade, particularly when they reach high densities. Government-supported conservation programs are needed to protect the unique natural habitats of Dhofar from disturbance and maintain the remarkable flora and fauna of this special area of the Arabian Peninsula.

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**Appendix** (continued on next three pages). Updated list of ant species of Oman, (#) species recorded from the Dhofar Governorate, (\*) species described from Oman, (§) new records for the Dhofar Governorate, (+) new records for Oman.

Subfamily	Species	Bioregion
<b>Dolichoderinae</b>	1. <i>Tapinoma melanocephalum</i> (Fabricius, 1793) (#) (§)	Neotropic/invasive
	2. <i>Tapinoma simrothi</i> Krausse, 1911	Palaearctic
	3. <i>Technomyrmex montaseri</i> Sharaf, Collingwood, Aldawood, 2011	Palaearctic/Endemic
<b>Formicinae</b>	4. <i>Camponotus aegyptiacus</i> Emery, 1915 (#)	Palaearctic
	5. <i>Camponotus arabicus</i> Collingwood, 1985 (#)	Afrotropic
	6. <i>Camponotus atlantis</i> Forel, 1890	Palaearctic
	7. <i>Camponotus carbo</i> Emery, 1877	Afrotropic
	8. <i>Camponotus diplopunctatus</i> Emery, 1915 (#) (+) (§)	Afrotropic
	9. <i>Camponotus fellah</i> Dalla Torre, 1893	Palaearctic
	10. <i>Camponotus flavomarginatus</i> Mayr, 1862 (#) (§)	Afrotropic
	11. <i>Camponotus foraminosus</i> Forel, 1879	Afrotropic
	12. <i>Camponotus gallagheri</i> Collingwood & Agosti, 1996 (*)	Palaearctic/Endemic
	13. <i>Camponotus hova</i> Forel, 1891	Afrotropic
	14. <i>Camponotus ilgii</i> Forel, 1894	Afrotropic
	15. <i>Camponotus maculatus</i> (Fabricius, 1782)	Afrotropic/ Palaearctic
	16. <i>Camponotus oasisium</i> Forel, 1890 (§)	Palaearctic
	17. <i>Camponotus sericeus</i> (Fabricius, 1798) (#)	Afrotropic
	18. <i>Camponotus somalinus</i> Andre, 1887	Afrotropic
	19. <i>Camponotus thoracicus</i> (Fabricius, 1804)	Palaearctic
	20. <i>Camponotus xerxes</i> Forel, 1904	Palaearctic
	21. <i>Cataglyphis abyssinica</i> (Forel, 1904)	Afrotropic
	22. <i>Cataglyphis acutinodis</i> Collingwood & Agosti, 1996	Afrotropic
	23. <i>Cataglyphis adenensis</i> (Forel 1904) (#)	Afrotropic
	24. <i>Cataglyphis arenaria</i> Finzi, 1940 (#)	Palaearctic
	25. <i>Cataglyphis diehlii</i> (Forel, 1902)	Palaearctic
	26. <i>Cataglyphis flavobrunnea</i> Collingwood & Agosti, 1996	Palaearctic
	27. <i>Cataglyphis holgerseni</i> Collingwood & Agosti, 1996	Palaearctic
	28. <i>Cataglyphis isis</i> (Forel, 1913) (#)	Palaearctic
	29. <i>Cataglyphis livida</i> (André, 1881)	Palaearctic
	30. <i>Cataglyphis nigra</i> (André, 1881)	Palaearctic
	31. <i>Cataglyphis rubra</i> (Forel, 1903) (#)	Palaearctic
	32. <i>Cataglyphis sabulosa</i> Kugler, 1981 (#)	Palaearctic
	33. <i>Cataglyphis savignyi</i> (Dufour, 1862)	Palaearctic
	34. <i>Cataglyphis urens</i> Collingwood, 1985 (#) (*)	Palaearctic
	35. <i>Lepisiota canescens</i> (Emery, 1897) (#) (§)	Afrotropic
	36. <i>Lepisiota carbonaria</i> (Emery, 1892) (#)	Afrotropic
	37. <i>Lepisiota dhofara</i> Collingwood & Agosti, 1996 (#) (*)	Afrotropic/Endemic



Appendix (continued). Updated list of ant species of Oman.

Subfamily	Species	Bioregion	
<b>Formicinae</b>	38. <i>Lepisiota elbazi</i> Sharaf & Hita Garcia, 2020 (#) (*)	Afrotropic/Endemic	
	39. <i>Lepisiota gracilicornis</i> (Fore 1892)	Afrotropic	
	40. <i>Lepisiota longinoda</i> (Arnold, 1920)	Afrotropic	
	41. <i>Lepisiota obtusa</i> (Emery, 1901) (#) (§)	Afrotropic	
	42. <i>Lepisiota omanensis</i> Sharaf & Monks, 2016 (*)	Palaearctic	
	43. <i>Lepisiota opaciventris</i> (Finzi, 1936) (#) (§)	Palaearctic	
	44. <i>Lepisiota sericea</i> (Forel, 1892)	Indomalaya	
	45. <i>Lepisiota spinisquama</i> (Kuznetsov-Ugamsky, 1929) (#)	Palaearctic	
	46. <i>Nylanderia flavipes</i> (Smith, 1874)	Palaearctic	
	47. <i>Nylanderia jaegerskioeldi</i> (Mayr, 1904) (#) (§)	Palaearctic	
	48. <i>Paratrechina longicornis</i> (Latreille, 1802) (#) (§)	Afrotropic	
	49. <i>Plagiolepis barbara</i> Santschi, 1911 (#)	Palaearctic	
	50. <i>Plagiolepis boltoni</i> Sharaf, Aldawood & Taylor, 2011	Palaearctic	
	51. <i>Polyrhachis lacteipennis</i> Smith, 1858	Afrotropic	
	<b>Leptanillinae</b>	52. <i>Leptanilla islamica</i> Baroni Urbani, 1977 (#) (+)	Afrotropic
		<b>Myrmicinae</b>	53. <i>Aphaenogaster asmaa</i> Sharaf, 2018 (*)
	54. <i>Aphaenogaster sarae</i> Sharaf, 2018 (*)		Palaearctic
	55. <i>Cardiocondyla breviscapa</i> Seifert, 2003		Indomalaya
	56. <i>Cardiocondyla emeryi</i> Forel, 1881		Neotropic/Invasive
	57. <i>Cardiocondyla gallagheri</i> Collingwood & Agosti, 1996 (*)		Palaearctic/Endemic
	58. <i>Cardiocondyla mauritanica</i> Forel, 1890		Palaearctic
59. <i>Cardiocondyla minutior</i> Forel, 1899 (#) (+) (§)	Indomalaya/Invasive		
60. <i>Cardiocondyla wroughtonii</i> (Forel, 1890) (#) (+) (§)	Indomalaya/Invasive		
61. <i>Cardiocondyla yemeni</i> Collingwood & Agosti, 1996 (#) (§)	Afrotropic		
62. <i>Carebara arabica</i> (Collingwood & van Harten, 2001) (#) (+) (§)	Afrotropic		
63. <i>Crematogaster acaciae</i> Forel, 1892 (#)	Afrotropic		
64. <i>Crematogaster aegyptiaca</i> Mayr, 1862	Palaearctic		
65. <i>Crematogaster antaris</i> Forel 1894	Palaearctic		
66. <i>Crematogaster chiarinii</i> Emery, 1881 (#)	Afrotropic		
67. <i>Crematogaster delagoensis</i> Forel, 1894	Afrotropic		
68. <i>Crematogaster jacindae</i> Sharaf & Hita Garcia, 2019 (#) (*)	Afrotropic/Endemic		
69. <i>Crematogaster melanogaster</i> Emery, 1895	Afrotropic		
70. <i>Crematogaster mimosae</i> Santschi, 1914	Afrotropic		
71. <i>Crematogaster oasisium</i> Santschi, 1911	Palaearctic		
72. <i>Crematogaster senegalensis</i> Roger, 1863	Afrotropic		
73. <i>Erromyrmica latinodis</i> (Mayr, 1872)	Indomalaya		
74. <i>Meranoplus mosalahi</i> Sharaf, 2019 (#) (*)	Afrotropic/Endemic		
75. <i>Messor caviceps</i> (Forel, 1902)	Palaearctic		
76. <i>Messor ebeninus</i> Santschi, 1927 (#) (§)	Palaearctic		

## Appendix (continued). Updated list of ant species of Oman.

Subfamily	Species	Bioregion
Myrmicinae	77. <i>Messor foreli</i> Santschi, 1923	Palaearctic
	78. <i>Messor galla</i> (Mayr, 1904) (#) (§)	Afrotropic/Palaearctic
	79. <i>Messor meridionalis</i> (André, 1883)	Palaearctic
	80. <i>Messor muscatus</i> Collingwood & Agosti, 1996 (*)	Palaearctic/Endemic
	81. <i>Messor rufotestaceus</i> (Foerster, 1850)	Palaearctic
	82. <i>Messor wasmanni</i> Krausse, 1910	Palaearctic
	83. <i>Monomorium abeillei</i> André, 1881	Palaearctic
	84. <i>Monomorium acutinode</i> Collingwood & Agosti, 1996 (*)	Palaearctic
	85. <i>Monomorium aeyade</i> Collingwood & Agosti, 1996 (*)	Palaearctic/Endemic
	86. <i>Monomorium areniphilum</i> Santschi, 191	Palaearctic
	87. <i>Monomorium barbatulum</i> Mayr, 1877	Palaearctic
	88. <i>Monomorium bicolor</i> Emery, 1877	Afrotropic
	89. <i>Monomorium brunneolucidulum</i> Collingwood & Agosti, 1996 (*)	Palaearctic
	90. <i>Monomorium carbo</i> Forel, 1910 (#)	Afrotropic
	91. <i>Monomorium clavicorne</i> André, 1881 (#) (+) (§)	Palaearctic
92. <i>Monomorium dirie</i> Collingwood & Agosti, 1996 (*)	Palaearctic/Endemic	
93. <i>Monomorium exiguum</i> Forel, 1894 (#) (§)	Afrotropic	
94. <i>Monomorium floricola</i> (Jerdon, 1851) (#) (+) (§)	Indomalaya/Invasive	
95. <i>Monomorium gallagheri</i> Collingwood & Agosti, 1996 (*)	Palaearctic/Endemic	
96. <i>Monomorium jizane</i> Collingwood & Agosti, 1996	Afrotropic	
97. <i>Monomorium niloticum</i> Emery, 1881 (#)	Palaearctic	
98. <i>Monomorium sahlbergi</i> Emery, 1898 (#) (+) (§)	Palaearctic	
99. <i>Monomorium subopacum</i> (Smith, 1858) (#) (§)	Palaearctic	
100. <i>Monomorium suleyile</i> Collingwood & Agosti, 1996	Afrotropic	
101. <i>Monomorium tumaire</i> Collingwood & Agosti, 1996	Afrotropic	
102. <i>Monomorium venustum</i> (Smith, 1858) (#)	Palaearctic	
103. <i>Nesomyrmex angulatus</i> (Mayr, 1862)	Palaearctic	
104. <i>Nesomyrmex micheleae</i> Sharaf, 2020 (#) (*)	Afrotropic/Endemic	
105. <i>Pheidole katonae</i> Forel, 1907	Afrotropic	
106. <i>Pheidole megacephala</i> (Fabricius, 1793) (#) (§)	Malagasy/Invasive	
107. <i>Pheidole parva</i> Mayr, 1865	Indomalaya	
108. <i>Pheidole rugaticeps</i> Emery, 1877	Afrotropic	
109. <i>Pheidole sculpturata</i> Mayr, 1866 (#)	Afrotropic	
110. <i>Pheidole sinaitica</i> Mayr, 1862	Palaearctic	
111. <i>Solenopsis omana</i> Collingwood & Agosti, 1996 (*)	Palaearctic/Endemic	
112. <i>Strumigenys membranifera</i> Emery, 1869 (#) (+) (§)	Palaearctic/Invasive	
113. <i>Tetramorium biskrense</i> Forel, 1904	Palaearctic	
114. <i>Tetramorium caldarium</i> (Roger, 1857) (#) (§)	Palaearctic	
115. <i>Tetramorium calidum</i> Forel, 1907	Palaearctic/Endemic	

**Appendix** (continued). Updated list of ant species of Oman.

Subfamily	Species	Bioregion
<b>Myrmicinae</b>	116. <i>Tetramorium chefketi</i> Forel, 1911	Palaearctic
	117. <i>Tetramorium depressiceps</i> Menozzi, 1933	Palaearctic
	118. <i>Tetramorium lanuginosum</i> Mayr, 1870 (#) (§)	Indomalaya/Invasive
	119. <i>Tetramorium sericeiventre</i> Emery, 1877 (#) (§)	Afrotropic/Palaearctic
	120. <i>Trichomyrmex destructor</i> (Jerdon, 1851)	Indomalaya/Invasive
	121. <i>Trichomyrmex mayri</i> (Forel, 1902) (#)	Afrotropic/Palaearctic
	122. <i>Trichomyrmex robustior</i> (Forel, 1892)	Afrotropic
	<b>Ponerinae</b>	123. <i>Anochetus annetteae</i> Sharaf, 2017 (*)
124. <i>Anochetus sedilloti</i> Emery, 1884 (#) (+) (§)		Palaearctic
125. <i>Brachyponera sennaarensis</i> (Mayr, 1862) (#)		Afrotropic/Palaearctic
126. <i>Hypoponera abeillei</i> (André, 1881)		Palaearctic
127. <i>Hypoponera punctatissima</i> (Roger, 1859)		Palaearctic
128. <i>Hypoponera ragusai</i> (Emery, 1894) (#) (+) (§)		Palaearctic
129. <i>Leptogenys maxillosa</i> (Smith, 1858) (#)		Afrotropic
130. <i>Platythyrea modesta</i> Emery, 1899		Afrotropic

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