THE GENUS *MESSOR* FOREL, 1890 (HYMENOPTERA: FORMICIDAE) IN CYPRUS

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Abstract.— Nine species of the genus *Messor* Forel have been reported from Cyprus to date. However, based on our samples and examined type material we confirm the presence of only three species on the island. *Messor bucephalus* **sp. nov.** is described as a new species to science, while *M. orientalis* Emery and *M. syriacus* Tohmé are redescribed based on the material from Cyprus. Their distribution, biology and possible misidentification with other species of the genus are discussed.

Key words.— Cyprus, Eastern Mediterranean, identification key, *Messor bucephalus*, new species

INTRODUCTION

Messor Forel, 1890 is a moderately large ant genus comprising 129 valid species and 37 valid subspecies (Bolton 2023). These are spread in the Palearctic, Afrotropical, and Oriental regions, with approximately 92 taxa of the genus being known from the Mediterranean subregion (Borowiec 2014, Salata and Borowiec 2018, Steiner *et al*. 2018, Barech *et al*. 2020). Its species are primarily granivorous and play an important role in seed dispersal. Most species are reported from open and arid habitats (e.g. savannahs, grasslands, phrygana, semideserts, and deserts), some occur in mountain steppes, whereas several species are often found in anthropogenic habitats (e.g. cities, tourist resorts and farms).

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Nine species have been recorded from Cyprus hitherto:

- *Messor alexandri* Tohmé & Tohmé, 1981 was noted generally from Cyprus by Menozzi (1929) under the unavailable name *Messor structor* ssp. *rufitarsis* var. *alexandri* Santschi, 1917. This record was repeated by Georgiadis *et al*. (2017);
- *Messor barbarus* (Linnaeus, 1767) was noted from Cyprus by Georghiou (1977) as *Messor barbara* L.;
- *Messor ebeninus* Santschi, 1927 was first reported for Cyprus by Georgiadis *et al*. (2017);
- *Messor intermedius* Santschi, 1927 was noted from Larnaka by Santschi (1939) under the unavailable name *Messor semirufus* st. *meridionalis* v. *intermedius*. This record was repeated by Georgiadis *et al*. (2017);
- *Messor meridionalis* (André, 1883) was noted around Nicosia by Santschi (1939) under the name *Messor semirufus* st. *meridionalis*. This record was repeated by Georgiadis *et al*. (2017);
- *Messor oertzeni* Forel, 1910 was first reported for Cyprus by Georgiadis *et al*. (2017);
- *Messor orientalis* (Emery, 1898) firstly was generally recorded from Cyprus by Emery (1908) under the unavailable name *Messor barbarus structor* var. *orientalis*, then Santschi (1939) noted this taxon from Larnaka under the unavailable name *Messor structor* st. *rufitarsis* v. *orientalis*. These records were repeated by Georgiadis *et al*. (2017). Borowiec and Salata (2020) generally noted *M. orientalis* from Cyprus based on their unpublished data;
- *Messor structor* (Latreille, 1798) was generally recorded from Cyprus by Borowiec and Salata (2012) and this record was repeated in Borowiec (2014) and Georgiadis *et al*. (2017). An endemic species of cricket, *Myrmecophilus cyprius* Stalling, 2017 was described from nests of *Messor* determined as *M. structor* (Stalling 2017);
- *Messor wasmanni* Krausse, 1910 was first reported for Cyprus by Georgiadis *et al*. (2017);

Our recent faunistic studies on the ants of Cyprus revealed only three species of the genus *Messor* in the collected material: *Messor orientalis*, as the only previously reported taxon, *Messor syriacus* Tohmé, 1969, and a third species, *M. bucephalus* **sp. nov.** – a taxon new to science. We give description of a new species and redescriptions of the two previously known taxa.

Material and methods

Specimens were collected in Cyprus from Ammochostos, Larnaka, Limassol, Nicosia, and Paphos districts as well as the Akrotiri UK Sovereign Base Area in 2012 and 2022. Explored habitats varied in vegetation and land cover, ranging in altitude from sea level to 1928 m. The dominant sampling method was direct sampling (hand collecting). Individual specimens were collected on the ground or close to the nests' entrance on the soil. All specimens were preserved mostly in absolute EtOH and partly in 75% EtOH. If not stated otherwise, the material listed in the species accounts was collected by L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata during the 2022 expedition.

Photos were taken using a Nikon SMZ 1500 stereomicroscope, Nikon D5200 photo camera, and Helicon Focus software. All given label data are in the original spelling, presented in square brackets; a vertical bar (|) separates data on different rows and double vertical bars (||) separate labels. Type specimens' photographs are available online on AntWeb (www.AntWeb.org) and are accessible using the unique CASENT identifying specimen code.

Museum abbreviations:

JDPC – Jakovos Demetriou Personal Collection;
HNHM – Hungarian Natural History Museum, Budapest, Hungary;
MNHW – Museum of Natural History, University of Wrocław, Poland;
MHNG – Muséum d'Historie Naturelle, Genève, Switzerland;
NHMB – Natural History Museum, Basel; Switzerland;
NHMUK – Natural History Museum, United Kingdom;
SIZK – Schmalhausen Institute of Zoology, Kiev, Ukraine;
USMB – Upper Silesian Museum, Bytom, Poland;
ZMUA – Museum of Zoology of the University of Athens, Greece.

The nomenclature describing pilosity inclination degree follows Wilson (1955). Appressed (0–5°) hairs run parallel or nearly parallel to the body surface. Decumbent hairs stand 10–40°, subdecumbent hair stands ~45° from the surface, suberect hairs bend about 10–20° from vertical, and erect hairs stand vertical or nearly vertical.

Measurements: all measurements are given in mm.

HL – head length; measured in a straight line from mid-point of anterior clypeal margin to mid-point of posterior margin in full-face view;
HW – head width; measured in full-face view directly behind the eyes;
SL – scape length; maximum straight-line length of scape excluding the basal condylar bulb;
EL – eye length, maximum eye length;
PW – pronotum width; maximum width of pronotum in dorsal view;
PRL – propodeum length; measured in lateral view, from metanotal groove to posterior margin of the propodeal lobe;
PRW – propodeal width; maximum width of propodeum in dorsal view;

PTL – petiole length; maximum length of the petiole from anterior margin of pedicel to posterior margin of node in lateral view;
PTH – height of petiolar node; measured from base of petiolar node in the middle of basal margin to top of petiole in lateral view;
WL – Weber's length; measured as diagonal length from the anterior end of pronotal convexity to the posterior margin of the propodeal lobe;
HFL – hind femur length; measured on dorsal side from trochanter to apex of femur.

Ratios:
CI – cephalic ratio, HL/HW;
FI – femur ratio, HFL/WL;
L/WI – length/width ratio, WL/PW;
PI – petiole ratio, PTH/PTL;
PRI – propodeum ratio, PRL/PRW;
SI – scape ratio, SL/HW.

Abbreviations:
w. – worker
s. – major worker
q. – queen
m. – male

Taxonomy

Synoptic list of *Messor* species known from Cyprus

M. bucephalus **sp. nov.**
M. orientalis (Emery, 1898).
M. syriacus Tohmé, 1969.

Key to Cypriot *Messor*

1. Head surface in both major and minor workers mostly smooth and shiny (Figs 5, 6, 19, 20). Head and gaster in major workers mostly black (Figs 2, 7, 8, 16-18). At least sides of head without erect hairs. Smaller species, WL in the largest major workers < 2.94 mm (mean for *M. syriacus* 2.42 and *M. bucephalus* 2.65) **2**
–. Head surface in major workers strongly sculptured with longitudinal and divergent striation (Fig. 13), in minor workers frontal part with longitudinal striation (Fig. 14). Head and gaster in both major and minor workers from yellowish brown to brown (Figs 9–12). Whole surface of head with numerous erect hairs. Larger species, WL in largest major workers up to 3.28 mm (mean 2.98) . . . . . ***M. orientalis*** (Emery)
2. Surface of first gastral tergite with long, suberect to erect hairs (Figs 1–4, 7, 8). Mesosoma usually completely black (Figs 1, 2), occasionally partly reddish (Figs 7, 8). Appressed pubescence on sides of head well marked (Figs 4, 7, 8) . . . . . ***M. bucephalus*** sp. nov.
–. Surface of first gastral tergite without long, suberect to erect hairs, at most at base and close to posterior margin with few very short erect hairs (Figs 15–18, 21, 22). Mesosoma usually partly to completely red (Figs 16, 18, 21), only occasionally completely black (Fig. 22). Appressed pubescence on sides of head very short and sparse (Figs. 15–18, 21, 22) . . . . . ***M. syriacus*** Tohmé

Species accounts

Messor bucephalus Salata, Demetriou, Georgiadis and Borowiec sp. nov.
Figs 1–8, 23

Type material examined. **Holotype** (pined): s.: CYPRUS, Paphos Kato | Paphos, littoral 3-7 m | 34.73647 / 32.4354 | 29 IV 2022, L. Borowiec (MNHW). **Paratypes** (pined): 1s.: the same data as holotype (MNHW); 1s.: CYPRUS, Paphos dist., 114 m | Akamas Pen., Avakas Gorge | 34.92415 / 32.34564 | 2 V 2012, L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00089 (MNHW); 4s., 3w.: CYPRUS, Paphos dist., 17 m | Akamas Pen., Avakas Gorge | mouth 34.91847 /32.32871 | 2 V 2012, L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00090 (MNHW); 7s.: CYPRUS, Paphos dist., 21 m | Cape Drepano | 34°54.027 N/32°19.159 E | 2 V 2012| L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00091 (MNHW); 3s., 6w.: CYPRUS, Paphos dist., 7 m | Paphos-Lempa beach area | 34°47.971 N/32°23.577 E | 1 V 2012| L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00092 (MNHW); 1s., 1w.: CYPRUS, Paphos dist., 11 m | Paphos-Lempa beach area | 34.80732 / 32.39417 | 7 V 2012| L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00093 (MNHW); 1w.: CYPRUS, Paphos dist., 51 m | Akamas Pen., Aphrodite's Baths | 34°03.403 N/ 32°20.660 E | 7 V 2012| L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00093 (MNHW); 4s., 3w.: CYPRUS, Paphos dist., 398 m | Agiou Neofytou mon. n. Tala | 34°50.672 N/ 32°26.686 E | 7 V 2012| L. Borowiec || Collection L. Borowiec | Formicidae | LBC-CY00203 (MNHW); 1w.: CYPRUS, Paphos, Akamas Pen., Lara | beach, 10 m | 34.91957 / 32.32751 | 18 IV 2022, L. Borowiec (MNHW); 1w.: CYPRUS, Paphos, Akamas Pen., Lara | beach, 10 m | 34.91957 / 32.32751 | 18 IV 2022, C. Georgiadis (MNHW); 1s.: CYPRUS, Limassol, 22 m | Limassol Agios Spiridonas | 34.6683 / 33.0022 | 13 IV 2022, J. Demetriou (MNHW); 1s., 4w.: CYPRUS, Akrotiri UK SBA, 3 m | Akrotiri urban park | 34.6006 / 32.9723 | 29 III 2022, J. Demetriou (MNHW).

Messor aralocaspius (Ruzsky, 1902) 20 (w.). Syntype (w.): *Messor barbara* var. *aralocaspia* Ruzsky, Merv Trans kasp. Gebiet (Russia) (leg. A. Forel)

(MHNG) [type images examined, AntWeb, CASENT 0907727, photos by Alexandra Westrich and Zach Lieberman, available on https://www.AntWeb.org].

Messor minor calabricus Santschi, 1927: 234 (w.). Syntype (w.): *Messor minor* var. *calabricus* Santschi, Sambiase (Calabria) (Italy) (leg. C. Minozzi) (NHMB) [type images examined, AntWeb, CASENT0913201, photos by Alexandra Westrich and Zach Lieberman, available on https://www.AntWeb.org].

Messor subgracilinodis Arnol'di, 1970: 73, fig. 1(1,2) (w.q.). Holotype (w.): *Messor subgracilinodis* Arnol'di, Dzhebel (Turkmenistan), 9.vi.1934 (V. Popov) (ZMUM) [type images examined, available on https://zmmu.msu.ru/]

Messor postpetiolatus Santschi, 1917: 90, fig. 1 (s.w.). Syntypes (w.): *Messor barbarus meridionalis v. postpetiolata* Sant., Tunisie, Kairouan (leg. F. Santschi) (NHMB) [type images examined, AntWeb, CASENT0913210 and CASENT0913211, photos by Alexandra Westrich and Zach Lieberman, available on https://www.AntWeb.org].

Messor rufus Emery, 1922: 96 (w.). Syntype (w.): *Messor minor rufus* Karav., Namanagan, Fergana (Uzbekistan) (leg. V. Sovinsky) (SIZK) [type images examined, AntWeb, CASENT0916930, photos by Kate Martynova, available on https://www.AntWeb.org].

***Other material examined* (357 workers, EtOH).** 2w.: Akrotiri UK SBA, SBA Police Station, 39 m, 34.588 / 32.9305, J. Demetriou; 12w.: Akrotiri UK SBA, JSHU field, 33 m, 34.588 / 32.9748, J. Demetriou; 8w.: Akrotiri UK SBA, Akrotiri west coast, 2 m, 34.6211 / 32.9228, 29 III 2022, J. Demetriou; 9w.: Akrotiri UK SBA, Akrotiri

Figures 1–2. Holotype major worker of *Messor bucephalus* sp. nov. (1) dorsal, (2) lateral (scale bar = 2 mm).

west coast, 4 m, 34.621 / 32.923, 1 IV 2022, J. Demetriou; 4w.: Limassol, Apollo Temple 2.5 km W of Kourion, 129 m, 34.67399 / 32.864125, L. Borowiec; 10w.: Limassol, Agios Spiridonas, 22 m, 34.6693 / 33.0037, 13 IV 2022, J. Demetriou; 9w.: Nicosia, Strovolos field, 204 m, 35.13558 / 33.35119, 21 IV 2021, C. Georgiadis; 26w.: Paphos, Agiou Neofytou monastery ad. Tala, 398 m, 34.84485 / 32.44509, 7 V 2012, L. Borowiec; 23 workers, Paphos, Akamas Peninsula, Avakas Gorge mouth (Lara beach), 17 m, 34.91847 / 32.32871, 2 V 2012, L. Borowiec; 106w.: Paphos, Cape Drepano, 21 m, 34.90024 / 32.31903, 2 V 2012, L. Borowiec; 4w.: Paphos, Diarizos river valley, 1 km N of Kidasi, 286 m, 34.81594 / 32.71654, 6 V 2012, L. Borowiec; 2w.: Paphos, Diarizos river valley, ad. Nikokleia, 62 m, 34.73005 / 32.58394, 6 V 2012, L. Borowiec; Paphos, Kato Paphos, Limnaria riv., 59 m, 34.76443 / 32.44022, 4-13 VII 2019, G. Hebda (USMB); 56w.: Paphos, Paphos-Lempa beach area loc. 1, 7 m, 34.79964 / 32.39314, 1 V 2012, L. Borowiec; 8w.: Paphos, Paphos-Lempa beach area loc. 2, 11 m, 34.80732 / 32.39417, 7 V 2012, L. Borowiec; 6w.: Paphos, Kato Paphos, 32-34 m, 34.75368 / 32.43391, 17 IV 2022, L. Borowiec and S. Salata; 10w.: Paphos, Kato Paphos, 6 m, 34.73647 / 32.4354, 29 IV 2022, L. Borowiec and S. Salata; 3w.: Paphos, Akamas Pen., Avakas Gorge, 33 m, 34.91757 / 32.33204, 18 IV 2022, L. Borowiec; 42w.: Paphos, Akamas Pen., Avakas Gorge mouth, Lara Beach, 10 m, 34.91957 / 32.32751, 18 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 1 worker: Paphos, Paphos Forest loc. 1 ad Pachiamos, 126 m, 35.16617 / 32.59157, 23 IV 2022, L. Borowiec and S. Salata; 7w.: Paphos, Akamas Pen., Aphrodite's Baths, 47 m, 35.05624 / 32.345, 27 IV 2022, L. Borowiec and S. Salata; 1 worker: Paphos, Tala, Agios Neofytos Monastery, 424 m, 34.84602 / 32.44784, 29 IV 2022, L. Borowiec and S. Salata; 2w.: Paphos, Peyia, Paphos Zoo, 108 m, 34.89236 / 32.34067, 30 IV 2022, L. Borowiec and S. Salata; 5w.: Paphos, Timi, Airport area, 5 m, 34.7056 / 32.4986, 24 X 2022, J. Demetriou; 5w.: Paphos, Peyia, sea caves, 20 m, 34.8842 / 32.3335, 18 X 2022,

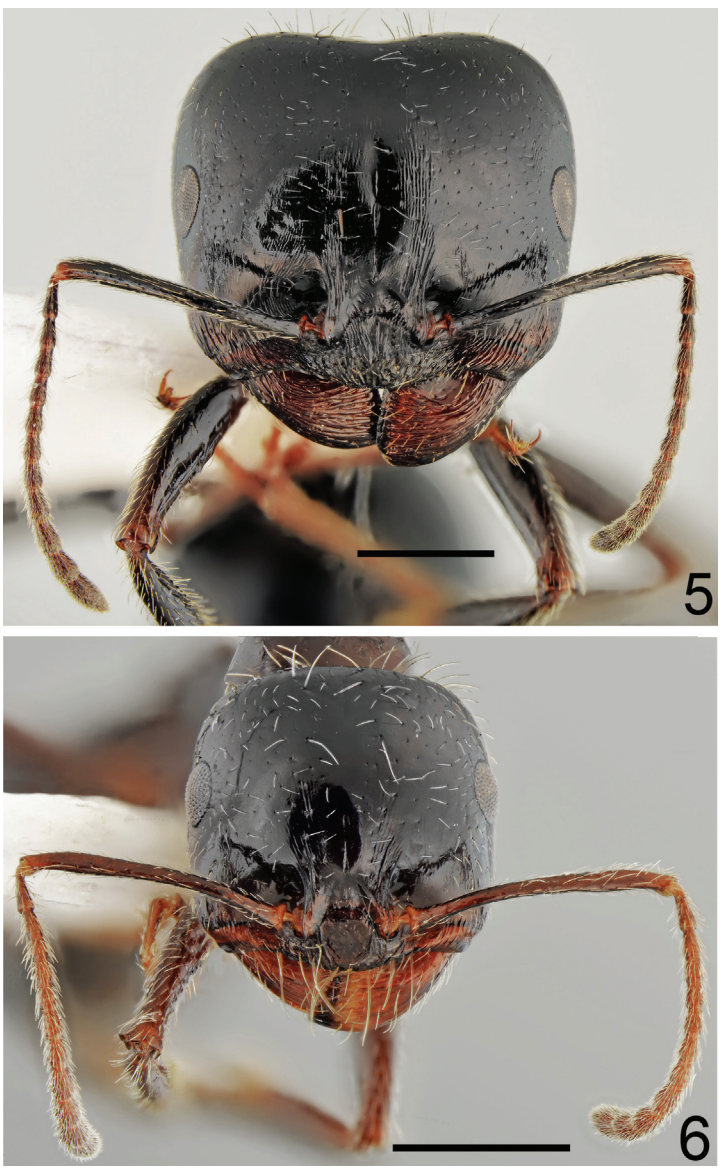
Figures 3–4. Paratype minor worker of *Messor bucephalus* sp. nov. (3) dorsal, (4) lateral (scale bar = 1 mm).

J. Demetriou; 1 worker: Paphos, Paphos, Harbour, 5 m, 34.7564 / 32.4098, 18 X 2022, J. Demetriou; 4w.: Paphos, Lemba, plant nursery, 88 m, 34.8132 / 32.4102, 18 X 2022, J. Demetriou; 5w.: Paphos, Gialia, plant nursery, 55 m, 35.1042 / 32.5137, 20 X 2022, J. Demetriou.

Etymology. Named after Bucephalus, Alexander the Great's horse. The horse was described as a creature with a massive head and predominantly black coat – features strongly resembling the morphology of the new species.

Diagnosis. *Messor bucephalus* is most similar to members of the *Messor instabilis* species-group [*sensu* Santschi (1927)] characterised by mostly smooth and shiny head with striation, if present, limited to central frons or anterior part of the head and sparse body setation (especially reduced on gaster). The group is speciose in the Mediterranean region and Middle East and represented by numerous taxa of various taxonomic rank and often unclear status.

Messor bucephalus belongs to the complex of species with small body size (HL and HW < 2.9 mm), predominantly black body coloration, and presence of erect setae on the whole surface of the first gastral tergite. In the Mediterranean region and the Middle East such combinations of characters are also found in *M. aralocaspius* (Ruzsky, 1902), *M. minor calabricus* Santschi, 1927, *M. subgracilinodis* Arnoldi, 1970, *M. postpetiolatus* Santschi, 1917, and *M. rufus* Santschi, 1923. *Messor rufus* differs from *M. bucephalus* by its bicolored head with gena and clypeus



Figures 5–6. Head of *Messor bucephalus* sp. nov. (5) major worker, (6) minor worker (scale bar = 1 mm).

yellow to red and the occipital part with a pale spot and less setose surface of its first gastral tergite. *Messor postpetiolatus* differs from *M. bucephalus* in postpetiole distinctly wider than petiole and lack of transverse striae on mesopleuron. *Messor minor calabricus* differs from *M. bucephalus* in sparser pubescence of the first gastral tergite, less regular striae on mesopleuron and sides of the propodeum and in rounded in profile propodeum in major workers. It is separated geographically from *M. bucephalus* and known only from southern Italy. *Messor aralocaspius* and *M. subgracilinodis* look the most similar to *M. bucephalus*, both have long and dense erect setae on their first gastral tergite and predominantly black body. Both species differ in more abundant erect setae on the head present on gena and area behind the eyes (*M. bucephalus* has no setosity on these parts of the head, only gena has sometimes 1–2 erect setae) and thinner and sparser transverse striae on mesopleuron with distinctly microreticulate interspaces (*M. bucephalus* has thick and dense striae and indistinctly microreticulated interspaces). Also, *M. aralocaspius* and *M. subgracilinodis* are separated geographically, both are distributed mostly in Central Asia with westernmost records placed in Iran.

Description. Major w. (n=8): **Measurements.** HL: 2.340 (2.25–2.47); HW: 2.593 (2.40–2.84); SL: 1.749 (1.62–1.82); EL: 0.494 (0.46–0.52); PW: 1.396 (1.29–1.48); PRL: 1.161 (1.06–1.29); PRW: 0.909 (0.84–1.00); PTL: 0.803 (0.71–0.86); PTH: 0.605 (0.56–0.63); WL: 2.650 (2.45–2.93); HFL: 2.286 (2.23–2.40); CI: 0.904 (0.857–0.938); SI: 0.677 (0.616–0.758); PI: 1.326 (1.268–1.387); FI: 0.879 (0.835–0.963); L/WI: 1.898 (1.854–1.980); PRI: 1.277 (1.233–1.309). **Color.** In most specimens, including the holotype, whole body black only gena with narrow reddish band and transparent posterior margins of gastral tergites yellowish (Figs 1, 2). Legs black, only knee yellowish to yellowish-brown,

Figures 7–8. Color variation of *Messor bucephalus* sp. nov. (7) major worker of pale form, (8) minor worker of pale form (scale bar = 1 mm).

tarsi dorsally yellowish-brown, ventrally yellow. Antennal scapi black, funicle usually black basally then gradually paler apically with last segments brown (Figs 1, 2, 5). In pale specimens gena with broad red band, mesosoma and petiole with red patches located on lateral surfaces, legs partly reddish-brown or brown with paler reddish apices, tarsi reddish, antennal scapi reddish-brown and funicle yellowish-red to red (Figs 7, 8). **Head.** Subrectangular, approximately 0.9 × as long as wide, sides below eyes slightly converging anterad, above eyes gently convex, posterior margin shallowly concave (Fig. 5). Anterior clypeal margin straight or with very shallow median emargination, with a row of 12–15 marginal yellowish setae. Clypeus without appressed pubescence, with a few suberect to erect setae and several very short erect hairs. Surface of the clypeus laterally with thick longitudinal striae, medially without striae except median keel, interspaces smooth and shiny (Fig. 5). Eyes small and oval, approximately 1.5 × as long as wide and 0.7–0.8 × as long as the gena. Frontal triangle impressed, with slightly irregular surface, shiny. Frontal carinae short, slightly extending beyond frontal lobes. Frons narrow, in the narrowest part approximately 0.2 × as wide as head width. Antennal fossa deep, with sculpture forming semicircular striae, interspaces shiny. Head mostly smooth and shiny, only frons centrally with longitudinal striation and deep median sulcus, also gena longitudinally striate and area behind eyes with remnants of striation. Surface covered with short and sparse, white appressed pubescence, especially around eyes, sides of head and occipital area but also in frontal area. Frons and occipitum additionally with sparse, white suberect and erect setae, occipital corners usually with more than 12 but less than 20 setae, frontal part with two rows of 8–10 setae, sides of the head and gena usually without standing setae, at most with 1–2 short suberect setae. Ventral part of the head with numerous, long erect setae, partly forming a J-shaped psammophores. Antennal scape moderately long, in frontal view almost straight, 0.6–0.7 × as long as the width of the head; base moderately extended, outer angle acute, inner angle forms small obtuse lobe. Scape before apex only slightly constricted; funiculus distinctly longer than scape, pedicel moderately elongated, approximately 0.75 × as long as segments 2 and 3 combined and 1.7 × as long as segment 2 (Fig. 5). Surface of the scape smooth and shiny, covered with long and sparse white subdecumbent to suberect hairs. Mandibles rounded, with deep grooves, surface shiny with a few long and short yellow setae, cutting edge in large majors without teeth or with serrulate edge. **Mesosoma.** Moderately long, approximately 1.8–1.9 × as long as wide. Pronotum regularly convex in profile and on the sides (Fig. 2). In lateral view promesonotum form regular convexity, propodeum positioned lower than promesonotum, flat anteriorly then angulate posteriorly, angulation margined by short, thick carina lateral but never form denticle or spine (Figs. 2, 7). Pronotal dorsum anteriorly with fine transverse striation, posteriorly smooth, lateral sides with distinct semicircular striae, interspaces shiny. Elevated dorsum of mesonotum smooth and shiny, posterior part with longitudinal striae, sides above mesopleuron with a triangular shiny plate. Mesopleura with dense, thick and transverse striae, interspaces smooth and shiny. Propodeum dorsally with thick and transverse striae, sometimes, including holotype, with longitudinal striae, occasionally with oblique and slightly irregular striae. Metapleura with dense, thick and longitudinal striae, interspaces on the whole propodeal surface smooth and shiny. Vestiture and setation of mesosoma variable, pronotum with extremely sparse, short appressed hairs and dorsolaterally with 15–20 short to very long, white erect setae, sides of the pronotum with a few short suberect setae, mesonotum with 16–20 long erect setae, propodeal dorsum on each side with 10–14 long setae, mesopleuron close to the posterior margin with a few short suberect setae and in the posteroventral corner with a group of moderately long suberect setae, metapleuron in posterolateral corners with a group of moderately long suberect setae. **Petiole.** Elongate, with long pedicel and moderately high triangular node, thin, PI 1.27–1.39, pedicel, anterior face and base of node with distinct reticulate sculpture, posterior face with strong transverse sculpture, top of petiole angulate, upper margin and sides with 16–20 erect setae (Fig. 2). **Postpetiole.** Rounded in profile, globular in dorsal view, 1.2–1.3 × as wide as the petiole, whole surface with numerous erect setae. **Gaster.** Whole surface smooth and shiny, covered with very sparse and short appressed hairs, and white to yellowish, moderately dense and long erect setae. **Legs.** Moderately elongate, femora distinctly swollen centrally, tibiae moderately widened apically, tarsi longer than tibiae. Whole surface of the legs diffusely microreticulated, covered with moderately dense and long, subdecumbent to erect setae.

The smallest worker: **Measurements.** HL: 1.08; HW: 1.01; SL: 0.98; EL: 0.27; PW: 0.66; PRL: 0.62; PRW: 0.48; PTL: 0.44; PTH: 0.30; WL: 1.40; HFL: 1.35; CI: 1.069; SI: 0.970; PI: 1.467; FI: 0.964; L/WI: 2.121; PRI: 1.292. **Color.** As in major workers but mesosoma often not as deep black as in majors, sometimes with reddish-brown background, legs and antennal scapi often yellowish-brown to brown, antennal funicle from yellow to yellowish-brown (Figs 3, 4). **Head.** Slightly more elongated than in major workers, approximately as long as wide, softly converging anterad and posterad, behind eyes regularly rounded, occipital margin of the head slightly convex (Fig. 6). Clypeus not as strongly sculptured as in majors, central plate mostly without

longitudinal striae, smooth and shiny. Eyes large but less oval than in major workers, 1.2 × as long as wide and 0.7 × as long as gena. Frons mostly smooth and shiny, longitudinal striation reduced to a few striae along the frontal carinae, gena mostly smooth and shiny with very short striae at the anterior margin. **Mesosoma.** Slimmer than in majors, WL/PW ratio approximately 2.1. Pronotal surface mostly smooth and shiny except remnants of transverse striation at anterior face and close to posterior margin of lateral sides. Sculpture of mesonotum and propodeum as in majors. Setation and vestiture of mesosoma as in majors but with lower number of setae, especially mesonotum with only 4–8 erect setae (Fig. 4). **Petiole and posteptiole.** As in major workers but posterior face of petiole without transverse striae. **Gaster.** As smooth and shiny as in majors, whole surface with erect setae slightly shorter than setae on mesosoma. **Legs.** Relatively longer than in majors, FI approximately 0.96, sculpture and setation as in major workers.

Biological notes. Thermophilous species, noted from low altitudes, from seacoast to 424 m. Prefers sunny, open areas like dirt roadsides, dry, sandy or gravel riverbanks, sea shores and beaches, marshlands close to seashore, salines and young pine forests. Also, often observed in open areas in anthropogenic sites such as cities and tourist resorts, in gardens, ruderal places, dirty parking lots, botanical gardens and nurseries. Occasionally noted from shadowed valleys close to old monasteries or inside canyons. Nests directly in the ground, workers penetrate small areas around the nest's entrance.

Comment. Most likely the record of *M. ebeninus* from Cyprus refers to *M. bucephalus*.

Messor orientalis (Emery, 1898)
Figs 9–14, 23

Stenamma (*Messor*) *structor* var. *orientalis* Emery, 1898: 143.

Distribution note. *Messor orientalis* was described based on workers collected from Sarepta (now Sarafand, Lebanon), Mersina (now Ýçel, capital city of Ýçel Province of southern Türkiye), Tiflis (now Tbilisi, Georgia), and Sir Daria (now Syr Darya valley, a river in Central Asia). Historically, the species was recorded also from Greece, Iran, Israel, Syria and Yemen but according to the recent revision of the *Messor structor* species-group (Steiner *et al.* 2018) and our studies on recently collected material, Greek records of *M. orientalis* refer to *M. mcarthuri* Steiner *et al.*, 2018 (see Salata and Borowiec 2019). Based on the results provided in the above-mentioned revision, material from Iran, Central Asia and Yemen labelled as *M. orientalis* should be revised based on molecular and morphometric studies as it may consist of several taxa belonging to the *M. structor* species-group. However, Cypriot populations morphologically resemble recently studied specimens of *M. orientalis* collected in mainland. For our studies we investigated workers sampled in Adana (Türkiye, 14 V 1993, leg. V. Vohralik), a city located only 60 km east of Ýçel (the type locality of *M. orientalis*), and Birecik (Türkiye, Þanlýurfa Province, 31 VIII 1988, leg. Růžička and Hlasová) placed close to the Syrian border. We also studied the syntype of *M. orientalis* collected in Mersina (= Ýçel) (AntWeb.org, CASENT0904132). Gathered evidence confirmed that the populations inhabiting Cyprus represent *M. orientalis*. Additionally, we suggest assigning all literature records of *M. alexandri*, *M. oertzeni* and *M. structor* from Cyprus to *M. orientalis*.

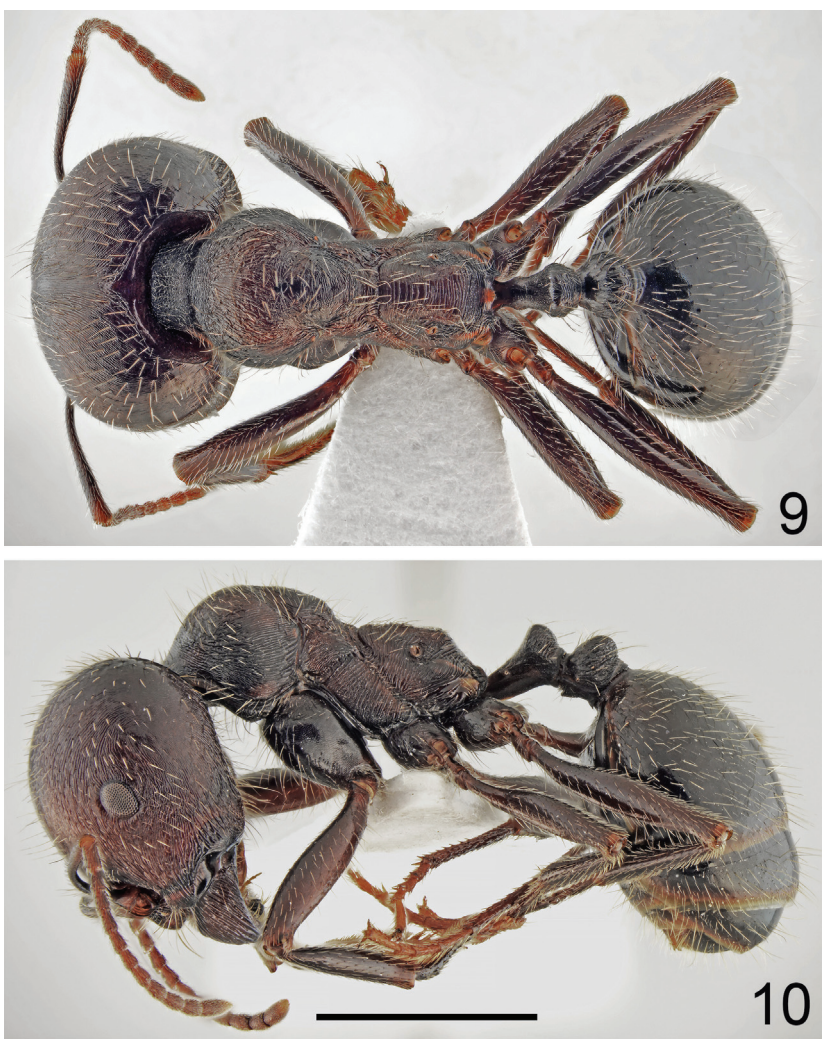
Material examined. 3w. (EtOH): Akrotiri UK SBA, Akrotiri Marsh, -1 m, 34.6382 / 32.93403, 20 IV 2012, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 10w. (EtOH): Akrotiri UK SBA, Akrotiri Marsh, 0 m, 34.6333 / 32.9201, J. Demetriou; 17w. (EtOH): Famagusta, Paralimni, 70 m, 35.03886 / 33.9752, 25 IV 2022, J. Demetriou and C. Georgiadis; 12w. (EtOH): Famagusta, Cape Pyla (Red Cliffs), 58 m, 34.94698 / 33.85917, 25 IV 2022, J. Demetriou and C. Georgiadis; 1w. (EtOH): Larnaca, Kiti dam, 47 m, 34.87157 / 33.55439, 22 IV 2022, J. Demetriou and C. Georgiadis; 20w. (EtOH): Larnaka, Skarinou, 156 m, 34.81835 / 33.3562, 25 IV 2022, J. Demetriou and C. Georgiadis; 3w. (EtOH): Limassol, ad Kyperounta, 1325 m, 34.9335 / 32.9666, 15 IV 2001, Efstathiou; 3w. (1 pined, 2 EtOH): Limassol, Agros, 1062 m, 34.9105 / 33.011, 19 VIII 2001, Tsaousis; 10w. (EtOH): Limassol, Limassol, Molos, 3 m, 34.6828 / 33.0543, 28 III 2022, J. Demetriou; 10w. (EtOH): Limassol, Polemidia, 52 m, 34.6912 / 33.0000, 9 IV 2022, J. Demetriou; 1 gyne (pined): Paphos, Agios Neofytos Monastery, 424 m, 34.84602 / 32.44784, 29 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 2w. (pined): Paphos; 6w. (EtOH): Paphos, Akamas Peninsula, Avakas Gorge, 114 m, 34.92415 / 32.34564, 3 V 2012, L. Borowiec, 6w. (EtOH): Paphos, Akamas Peninsula, Avakas Gorge, 33 m, 34.91757 / 32.33204, 18 IV 2022, L. Borowiec; 12w. (5 pined, 7 EtOH): Paphos, Akamas Peninsula, Avakas Gorge mouth, Lara beach, 17 m, 34.91847 / 32.32871, 3 V 2012, L. Borowiec; 22w. (4 pined, 18 EtOH): Paphos, Akamas Peninsula, Cape Drepano, 21 m, 34.90024 / 32.31903, 2 V 2012, L. Borowiec; 6w. (1 pined, 5 EtOH): Paphos, Diarizos river valley, 1 km N of Kidasi, 286 m, 34.81594 / 32.71654, 6 V 2012, L. Borowiec; 23w. (6 pined, 17 EtOH): Paphos, Diarizos river valley, ad Nikokleia, 62 m, 34.73005 / 32.58394, 6 V 2012, L. Borowiec; 33w. (3 pined, 30 EtOH): Paphos, Diarizos river valley, ad Fasula, 173 m, 34.76222 / 32.62087, 6 V 2012, L. Borowiec; 11w. (2 pined, 9 EtOH): Paphos, Diarizos river valley, Extreme View Cafe loc. 1, 251 m, 34.78925

/ 32.6939, 19 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 4w. (EtOH): Paphos, Diarizos river valley, Rocks of Chasampoulion loc. 1a, 269 m, 34.79659 / 32.70235, 19 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 19w. (EtOH): Paphos, Paphos Lempa, Sunny Hill Aparthotel, 56 m, 34.8042 / 32.40078, 6 V 2012, L. Borowiec; 4w. (EtOH): Paphos, Evretou Dam, 172 m, 34.96165/ 32.47479, 21 IV 2022, L. Borowiec and S. Salata; 1 w. (EtOH): Paphos, ad Dora, 432 m, 34.77257/ 32.75035, 28 IV 2022, L. Borowiec and S. Salata; 21w. (1 pined, 20 EtOH): Paphos, Peyia, Paphos Zoo, 108 m, 34.89236/ 32.34067, 28 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 12w. (EtOH): Paphos, 1.5 km N of Lasa, 367 m, 34.9387/ 32.5244, 31 III 2022, J. Demetriou; 3w. (EtOH): Paphos, Peyia, sea caves, 20 m, 34.8842/ 32.3335, 18 X 2022, J. Demetriou; 4w. (EtOH): Paphos, Peyia, 20 m, 34.8623/ 32.3565, 18 X 2022, J. Demetriou; 5w. (EtOH): Paphos, Mesogi, Acropolis, 285 m, 34.8165/ 32.4524, 20 X 2022, J. Demetriou.

Messor mcarthuri Steiner *et al*., 2018: 401, figs. 2, 5ae, be, ce, de, ee (w.q.). Holotype (w): *Messor mcarthuri*, Türkiye, Mugla, Koycegiz (leg. S. Csõsz) (HNHM) [type images examined, AntWeb, CASENT 0922405, photos by Michele Esposito, available on https://www.AntWeb.org].

Messor orientalis (Emery, 1898): 143 (w.q.m.). Syntype (w): *Stenamma* (*Messor*) *structor* var. *orientalis* Emery., Asia Minor, Mersina (Türkiye) (leg. Holtz) (MSNG) [type images examined, AntWeb, CASENT0904132, photos by Alexandra Westrich and Will Ericson, available on https://www.AntWeb.org].

Messor ponticus Steiner *et al*., 2018: 399, figs. 2, 5ab, bb, cb, db, eb, fb (w.q.m.). Holotype (w.): *Messor ponticus*, Bulgaria, viz. Strouma valley, SW Zemen (leg. T. Lubomirov) (HNHM) [type images examined,



Figures 9–10. Major worker of *Messor orientalis* (Emery) (9) dorsal, (10) lateral (scale bar = 2 mm).

AntWeb, CASENT0922403, photos by Michele Esposito, available on https://www.AntWeb.org].

Messor varrialei Emery, 1921: 215, fig. 6 (s.). Syntype (w.): *Messor barbarus* subsp. *varrialei* Emery., Anatolia, Budrum (Türkiye) (leg. Dre. Varriale) (MSNG) [type images examined, AntWeb, CASENT 0905855, photos by Alexandra Westrich and Zach Lieberman, available on https://www.AntWeb.org].

Comparative note. A member of the *Messor structor* species-group characterised by distinctly sculptured head and mesosoma (head completely or mostly with longitudinal striation, often arching posterolaterally in occipital area and forming semicircular sculpture above and behind eyes) (Steiner *et al*. 2018). The group comprises numerous taxa of various and often confusing taxonomic status. Recently, Steiner *et al*. (2018) published results of integrative studies performed on some members of the *Messor structor* species-group but the scope of this study did not cover taxa occurring in the Middle East and some areas of the eastern Mediterranean. Thus, *M. orientalis* was omitted in this revision.

Messor orientalis is similar to the largest species of the *structor* species-group: *M. mcarthuri* Steiner *et al*., 2018, *M. ponticus* Steiner *et al*., 2018 and *M. variallei* Emery, 1921. *Messor ponticus* distinctly differs from *M. orientalis* in reduced or absent sculpture on postocular area on the head of major workers while *M. orientalis* has postocular area in major worker striate. *Messor ponticus* is also separated geographically, its distribution is mostly limited to territories of Romania, Bulgaria, SW Ukraine, continental Greece and Aegean Türkiye. *Messor mcarthuri* differs from *M. orientalis* in less angulate propodeum in profile and lack of propodeal denticle, less sculptured postocular area with partly shiny interspaces between striation, shorter hairs on the ventral side of the head usually only slightly longer than the eye length, and

Figures 11–12. Minor worker of *Messor orientalis* (Emery) (11) dorsal, (12) lateral (scale bar = 1 mm).

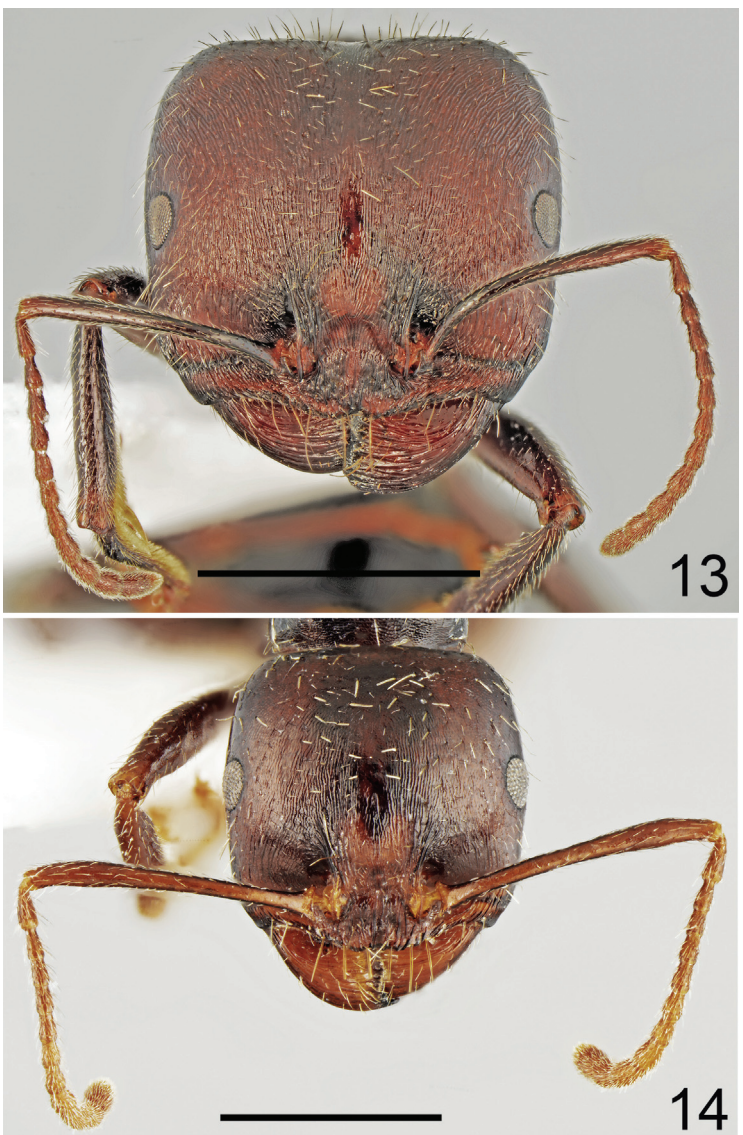
shorter first segment of funicle only 1.2 × as long as segment 2. While *M. orientalis* has the propodeum distinctly angulate in profile, often with thick lateral carinae and small propodeal denticle, hairs on the ventral side of the head are longer, mostly distinctly longer than the eye length, and the first segment of the funicle is longer, 1.5–1.6 × as long as segment 2. Poorly studied *M. variallei* Emery, 1921 is the most similar due to similarly elongate first segment of funicle and the length of setae on the ventral surface of the head, but it differs from *M. orientalis* in less angulate propodeum and in the sculpture of the first gastral tergite forming an elongated pits at the base of each erect seta. Both *M. mcarthuri* and *M. varrialei* are distributed mostly westwards from known localities of *M. orientalis*, covering the area of the Aegean Region and Crete.

Description. Major w. (n=7): **Measurements.** HL: 2.606 (2.40–2.77); HW: 2.736 (2.50–2.99); SL: 1.884 (1.78–1.97); EL: 0.401 (0.35–0.44); PW: 1.533 (1.44–1.60); PRL: 1.306 (1.21–1.40); PRW: 1.013 (0.92–1.09); PTL: 0.831 (0.73–0.92); PTH: 0.603 (0.57–0.63); WL: 2.976 (2.70–3.28); HFL: 2.387 (2.23–2.50); CI: 0.954 (0.930–0.978); SI: 0.690 (0.656–0.712); PI: 1.379 (1.281–1.552); FI: 0.803 (0.762–0.826); L/WI: 1.940 (1.875–2.050); PRI: 1.290 (1.229–1.340). **Color.** Head in the palest specimens yellow, in most specimens yellowish-brown or reddish-brown, in the darkest specimens dark brown (Figs 10, 11). Mesosoma the same color as the head or slightly darker, often bicolored with mixed brownish and brownish-black spots, petiole, postpetiole and gaster usually darker than mesosoma, in the darkest specimens black. Legs in the palest specimen yellow, usually reddish-brown with tibiae slightly darker than femora and tarsi distinctly paler colored than tibiae and femora, yellowish to reddish. Antennal scapi in the palest specimen yellow, usually reddish-brown to brown, funicle usually paler than scapus, yellowish-red to reddish-brown (Fig. 13). **Head.** Subrectangular, approximately 0.95 × as long as wide, sides below eyes slightly converging anterad, above eyes gently convex, posterior margin shallowly concave (Fig. 13). Anterior clypeal with deep median emargination, with a row of 10–12 marginal yellow setae, the longest as long as the clypeal length. Clypeus without appressed pubescence, with 10–12 suberect to erect setae and 2–4 short erect hairs. Whole surface with thick longitudinal striae (Fig. 13). Eyes very small and suboval, approximately 1.2 × as long as wide and 0.5 × as long as the gena. Frontal triangle shallowly impressed, indistinctly bordered from clypeus, with thick longitudinal and oblique thin striae. Frontal carinae short, slightly extending beyond frontal lobes. Frons narrow, in the narrowest part approximately 0.25 × as wide as the head width. Antennal fossa deep, with sculpture forming complete semicircular striae, interspaces with microreticulated sculpture. Head entirely sculptured, with dense and longitudinal striae, above eyes striae arching posterolaterally, lateral sides with sculpture fading posteriorly. Sometimes central frons with small smooth area. Interspaces between striation microsculptured, the surface slightly opalescent. Head covered with very short, sparse, yellowish and appressed pubescence and numerous moderately long to very long, decumbent to erect setae, also on the sides of the head and gena. Ventral part of the head with numerous, long erect setae, J-shaped psammophores absent. Antennal scape moderately long, in frontal view almost straight, approximately 0.7 × as long as the width of the head; base strongly extended, both outer and inner angle angulate. Scape before its apex, only slightly constricted; funiculus distinctly longer than the scape, pedicel moderately elongated, 0.7–0.8 × as long as segments 2 and 3 combined and 1.5–1.6 × as long as segment 2 (Fig. 13). Surface of the scape microreticulated, covered with long and sparse white decumbent to subdecumbent hairs. Mandibles rounded, with deep grooves, surface shiny with a few long and short yellow setae, cutting edge in large majors usually with sharp teeth, occasionally only serrulate. **Mesosoma.** Moderately long, approximately 1.9–2.1 × as long as wide (Fig. 10). In lateral view promesonotum forms regular convexity, propodeum positioned lower than promesonotum, flat or slightly convex anteriorly then angulate posteriorly, angulation sometimes forms an obtuse denticle. Pronotal dorsum anteriorly with thick transverse striation, top with longitudinal striation, sides with distinct longitudinal to semicircular striae, interspaces with distinct microreticulation. Elevated dorsum of mesonotum with thin longitudinal and oblique striae, posterior part with transverse striae, sides above mesopleuron with transverse and oblique rugae. Mesopleura with moderately dense, thick transverse striae, interspaces strongly microreticulated, surface dull. Propodeum dorsally with thick transverse striae, sides with oblique and around spiracle circular striae. Metapleura with dense, longitudinal and semicircular striae, interspaces on the whole propodeal surface with distinct microreticulation, dull. Setation of mesosoma variable composed with sparse short and numerous long erect setae, pronotum with extremely sparse, short suberect hairs and dorsolaterally with 20–30 short to very long, yellowish erect setae, sides of the pronotum with numerous short to moderately long suberect to erect setae, mesonotum with several short to moderately long hairs and 30–40 long, yellowish erect setae, only slightly shorter than the longest setae on pronotum, propodeal dorsum a with 24–36 long setae, distinctly shorter than setae on mesonotum and with a few short erect setae, only posterior slope without erect setae, mesopleuron close to posterior margin with several short suberect setae and metapleuron in posterolateral corners with a group of moderately long suberect setae. **Petiole.**

Elongate, with long pedicel and moderately high triangular node, thin, PI 1.28–1.48, pedicel, anterior face and base of node with strong reticulate sculpture, posterior face with thick oblique to transverse striae, top of petiole obtusely angulate, upper margin and sides with 14–20 erect setae (Fig. 10). **Postpetiole.** Rounded in profile, globular in dorsal view, approximately 1.3 × as wide as the petiole, whole surface strongly microreticulated and with additional striae, with numerous short and long erect setae, partly longer than setae on petiolar node. **Gaster.** Whole surface with distinct microreticulate sculpture but without impressed setal pores, covered with sparse short decumbent and long erect, yellowish setae. **Legs.** Moderately elongate, femora distinctly swollen in the middle, tibiae moderately widened apically, tarsi longer than tibiae. Whole surface of the legs diffusely microreticulate, covered dorsally with moderately dense and long, decumbent and on sides subdecumbent to suberect setae.

The smallest minor worker: **Measurements.** HL: 1.42; HW: 1.35; SL: 1.32; EL: 0.26; PW: 0.89; PRL: 0.77; PRW: 0.63; PTL: 0.54; PTH: 0.36; WL: 1.92; HFL: 1.69; CI: 1.052; SI: 0.978; PI: 1.500; FI: 0.880; L/WI: 2.157; PRI: 1.222.

Color. Similar to major workers but often paler brown than most majors, legs often yellowish-brown to brown. Antennae sometimes with yellowish-brown scapi and yellowish funicle (Figs 11, 12). **Head.** Slightly more elongated than in major workers, approximately 1.1 × as long as wide, softly converging anterad and posterad, behind eyes regularly rounded, occipital margin of the head slightly convex (Fig. 14). Clypeus not as strongly sculptured as in majors but longitudinal



Figures 13–14. Head of *Messor orientalis* (Emery) (13) major worker (scale bar = 2 mm), (14) minor worker (scale bar = 1 mm).

striae cover the whole surface and interspaces distinctly microreticulate. Eyes small and less oval than in major workers, 1.2 × as long as wide and 0.6 × as long as the gena. Frons with longitudinal striation, also gena and antennal fossa with distinct striation, in the posterior half of the head striation gradually disappears and transforms into microreticulate sculpture partly tending to form linear figures, postocular area and occipital corners with diffused microreticulation or partly smooth and shiny but the central part of the occipitum with distinct miroreticulation. **Mesosoma.** Slimmer than in majors. Dorsum of pronotal surface anteriorly with strong reticulate sculpture, on top with oblique and longitudinal striae and microreticulate interspaces, sides with fine semicircular striae or microsculpture tending to form semicircular and longitudinal figures, interspaces with diffused microreticulation. Sculpture of the mesonotum and the propodeum as in majors but striae less distinct and thus background microsculpture more visible. Setation and vestiture of the mesosoma as in majors but with less setae, especially mesonotum with only 8–10 erect setae, propodeum dorsum often with only a pair of setae or with only short setae (Fig. 12). **Petiole and postpetiole.** As in major workers but posterior face of petiole and postpetiole without or with remnants of longitudinal striae, only with strong microreticulate sculpture. **Gaster.** With reticulate microsculpture, setation as in majors. **Legs.** As long as in majors with FI 0.88, sculpture of the surface diffused but setation as in major workers.

Biology. Thermophilous species, noted from low and mid altitudes, from seacoast to 1325 m. Prefers sunny, open areas like seashores, gravel riverbanks, pastures, grasslands and agricultural fields. But often also observed in less sunny habitats with phrygana, inside pine forests with bushes or in gorges. The species was also observed in cities and tourist resorts, in gardens, ruderal places, dirty parking lots, rural roads, and banana cultivations. Nests directly in the ground, workers penetrate moderate areas but they do not create well-trodden paths leading to the nest entrance.

Messor syriacus Tohmé, 1969
Figs 15–23

Messor minor st. *laboriosus* var. *syriacus* Santschi, 1927: 241 (unavailable name).
Messor syriacus Tohmé, 1969: 9 (first valid combination).

Distribution note. *Messor syriacus* was described from Syria, Damas (= Damascus) and later recorded also from Iran, Israel, Lebanon, Saudi Arabia, and eastern Türkiye (Borowiec 2014). Populations from Iran and Saudi Arabia slightly differ from populations of more western and northern distribution and maybe represent another cryptic species. However, this statement needs verification based on molecular data. Cypriot records of *M. intermedius*, *M. meridionalis* and *M. wasmanni* most likely refer to *M. syriacus*.

Material examined. 1 w. (EtOH): Famagusta, Kavo Greco, 51 m, 34.96647 / 34.06698, 25 IV 2022, J. Demetriou and C. Georgiadis; 43w. (2 pined, 41 EtOH): Famagusta, Achna reservoir, 40 m, 35.05017 / 33.81183, 25 IV 2022, J. Demetriou and C. Georgiadis; 10w. (EtOH): Larnaca, Tekke mosque, 6 m, 34.88554 / 33.61008, 22 IV 2022, J. Demetriou and C. Georgiadis; 15w. (EtOH): Larnaca, Larnaca Salt Lake, 4 m, 34.91047 / 33.60489, 22 IV 2022, J. Demetriou and C. Georgiadis; 3w. (EtOH): Limassol, ad. Kyperounta, 1325 m, 34.9335 / 32.9666, 15 IV 2001, Efstathiou; 4w. (EtOH): Nicosia, Potamia, 188 m, 35.04751 / 33.43766, 21 IV 2022, J. Demetriou and C. Georgiadis; 30w. (EtOH): Nicosia, Geri, 182 m, 35.09006 / 33.44064, 21 IV 2022, J. Demetriou and C. Georgiadis; 25w. (EtOH): Nicosia, Peristerona, 212 m, 35.1339 / 33.08104, 26 IV 2022, J. Demetriou and C. Georgiadis; 1 w. (pined): Paphos, Diarizos river valley, 1 km N of Kidasi, 286 m, 34.81594 / 32.71654, 6 V 2012, L. Borowiec; 1 w. (pined): Paphos, Panagia-Cedar Valley rd. loc. 1, 755 m, 34.92718 / 32.64728, 5 V 2012, L. Borowiec; 5w. (2 pined, 3 EtOH): Paphos, Diarizos river valley, Extreme View Cafe loc. 2, 254 m, 34.78912 / 32.69476, 19 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 6w. (pined): Paphos, Diarizos river valley, Agios Georgios, Extreme View Cafe loc. 2, 257 m, 34.7893 / 32.6947, 19 IV 2022, J. Demetriou; 4w. (EtOH): Paphos, ad Gialia, 155 m, 35.09447 / 32.5359, 23 IV 2022, L. Borowiec and S. Salata; 2w. (pined): Paphos, Akamas Pen., Aphrodite's Baths, 47 m, 35.05624 / 32.345, 27 IV 2022, L. Borowiec and S. Salata; 2w. (EtOH): Paphos, road F612 ad Ag. Konstantinos loc. 2, 397 m, 34.74329 / 32.67197, 28 IV 2022, L. Borowiec and S. Salata; 9w. (1 pined, 8 EtOH): Paphos, ad Kalepia, 414 m, 34.83728 / 32.50318, 29 IV 2022, L. Borowiec, J. Demetriou, C. Georgiadis and S. Salata; 12w. (7 pined, 5 EtOH): Paphos, Pomos, 38 m, 35.1545 / 32.5425, 22 III 2022, J. Demetriou.

Messor laboriosus Santschi, 1927: 240, fig. 3 (w.q.). Syntype (w.): *Messor minor laboriosus* Snt., (leg. N. Kusnezov) (SIZK) [type images examined, AntWeb, CASENT0917756, photos by Kate Martynova, available on https://www.AntWeb.org].

Messor mediosanguineus Donisthorpe, 1946: 53 (s.w.). Paratype (w.): *Messor barbarus* spp. *mediosanguineus* Donisthorpe, 1946, Türkiye (NHMUK) [type images examined, AntWeb, CASENT0900484, photos by Ryan Perry and Zach Lieberman, available on https://www.AntWeb.org].

Messor minor calabricus Santschi, 1927: 234 (w.). Syntype (w.): *Messor minor var. calabricus*

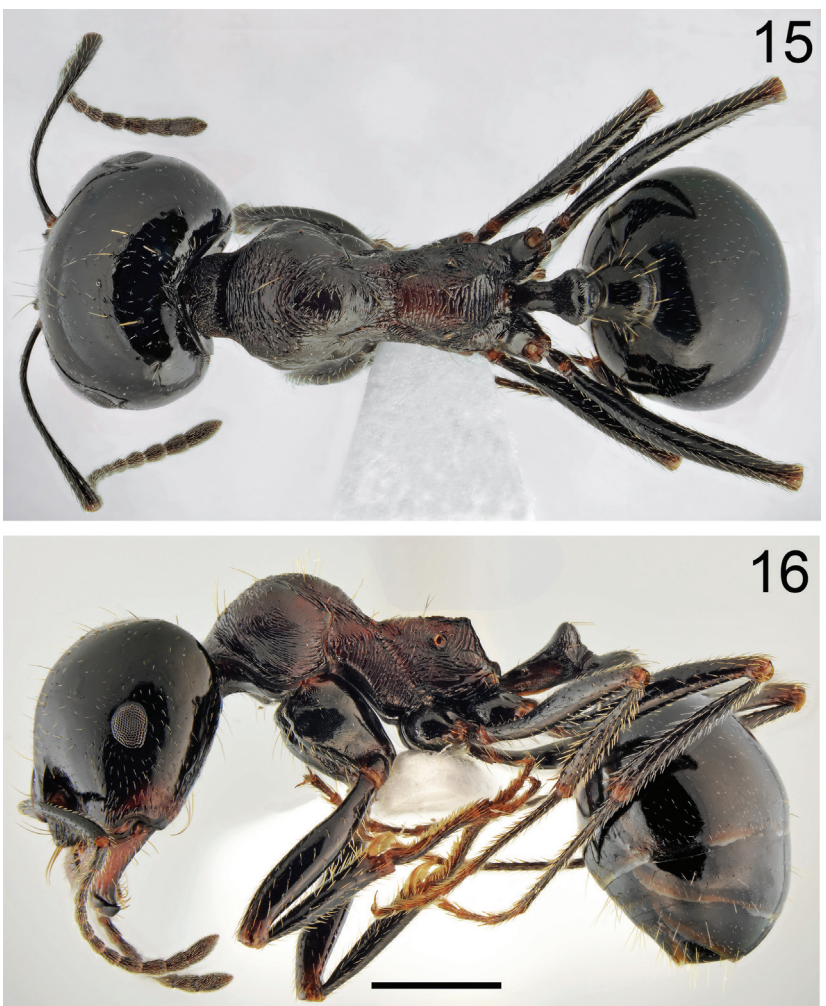
Santschi, Sambiase (Calabria) (Italy) (leg. C. Menozzi) (NHMB) [type images examined, AntWeb, CASENT 0913201, photos by Alexandra Westrich and Zach Lieberman, available on https://www.AntWeb.org].

Messor rufus Emery, 1922: 96 (w.). Syntype (w.): *Messor minor rufus* Karav., Namanagan, Fergana (Uzbekistan) (leg. V. Sovinsky) (SIZK) [type images examined, AntWeb, CASENT0916930, photos by Kate Martynova, available on https://www.AntWeb.org].

Messor syriacus Tohmé, 1969: 9 (w.). Syntype (w.): *Messor aralocaspius laboriosus var. syriacus* Sant., Syrie, Damas (Syria, Damascus) (leg. G. de Kerville) (NHMB) [type images examined, AntWeb, CASENT0913178, photos by Alexandra Westrich and Zach Lieberman, available on https://www.AntWeb.org].

Comparative note. *Messor syriacus* belongs to the *Messor instabilis* species-group [*sensu* Santschi (1927), for characteristic see diagnosis of *M. bucephalus*].

Messor syriacus belongs to the complex of species with a small body size (HL < 2.3 mm and HW < 2.5 mm), bicolored body with completely or partly reddish mesosoma and entirely or predominantly black head and gaster, postpetiole not or only slightly wider than the petiolar node, and lack or presence of very sparse and short setosity on the first gastral tergite. In the Mediterranean Basin such combinations of characters share *M. laboriosus* Santschi, 1927, *M. mediosanguineus* Donisthorpe, 1946, *M. minor calabricus* Santschi, 1927, *M. rufus* Santschi, 1923 and *M. syriacus* Tohmé, 1969. *Messor laboriosus* differs in a strongly angulate propodeum often forming an obtuse propodeal spine and presence of sparse erect setae on the whole surface of the first gastral tergite; *M. rufus* differs in its bicolored head (gena and clypeus broadly yellow to red, the occipital area with a pale spot) and presence of sparse erect setae on the whole surface of the first gastral tergite; *M. mediosanguineus* differs in presence of a lobiform, obtuse propodeal spines on



Figures 15–16. Major worker of *Messor syriacus* Tohmé (15) dorsal, (16) lateral (scale bar = 1 mm).

propodeum; *M. minor calabricus* differs in rounded in profile propodeum in major workers and never completely red mesosoma, this species also is the most geographically separated from *M. syriacus* (occurs in southern Italy). Small major workers of *Messor intermedius* Santschi, 1927 with completely black head are similar to *M. syriacus* but differ in an obtuse propodeal angle, lack of erect setae on the first gastral tergite and presence of at most four erect setae on the occipital margin of the head.

Description. Major w. (n=5): **Measurements.** HL: 2.066 (1.92–2.23); HW: 2.18 (2.00–2.38); SL: 1.749 (1.62–1.82); EL: 0.396 (0.37–0.42); PW: 1.266 (1.16–1.36); PRL: 1.082 (1.02–1.16); PRW: 0.866 (0.79–0.94); PTL: 0.742 (0.63–0.82); PTH: 0.502 (0.47–0.54); WL: 2.424 (2.21–2.60); HFL: 2.138 (2.01–2.31); CI: 0.949 (0.918–0.990); SI: 0.749 (0.706–0.780); PI: 1.477 (1.286–1.569); FI: 0.883 (0.856–0.914); L/WI: 1.915 (1.846–2.000); PRI: 1.253 (1.170–1.294).

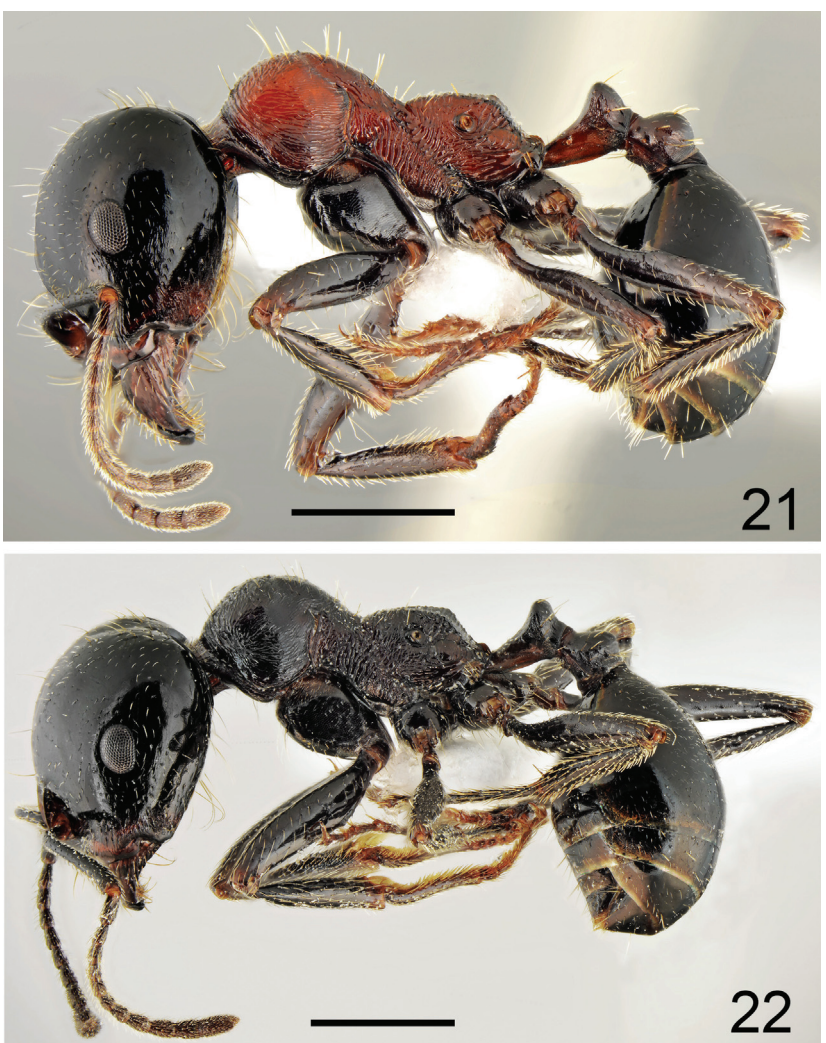
Color. In typically colored specimens (as in syntypes described from Damascus) head black with narrowly reddish gena, mesosoma almost uniformly red, petiole and postpetiole reddish ventrally and reddish-brown dorsally, gaster black with yellowish transparent posterior margin of tergites (Fig. 21). In Cyprus this form is rare (approximately 10% of examined specimens) a form with the head and gaster colored as in the typical form but with mesosoma with mixed red, brown and black in various proportions is more common (Figs 15, 16), in an extreme dark rare form the mesosoma is almost completely black (Fig. 22). Legs in all forms dark colored, coxa, trochanters, femora and tibiae black only knee yellowish to yellowish-brown, tarsi dorsally yellowish-brown, ventrally yellow. Antennae usually black, in the palest typical form scapi black, funicle usually black basally then gradually paler colored apically with the last segments being brown. **Head.** Subrectangular, approximately 0.9 × as

Figures 17–18. Minor worker of *Messor syriacus* Tohmé (17) dorsal, (18) lateral (scale bar = 1).

long as wide, sides below eyes almost parallel, above eyes gently convex, posterior margin concave (Fig. 19). Anterior clypeal margin straight, with a row of 6–8 marginal yellow setae, the longest slightly shorter than the clypeal length. Clypeus without appressed pubescence, with a pair of long erect setae, slightly shorter than the marginal setae, and with a few very short erect hairs. Surface on the sides with thick longitudinal striae, central plate on the sides with oblique striae, medially without striae with slightly irregular surface (Fig. 19). Eyes small and oval, approximately 1.4 × as long as wide and 0.7–0.8 × as long as the gena. Frontal triangle impressed, with slightly irregular surface and two longitudinal striae, shiny. Frontal carinae short, slightly extending beyond frontal lobes. Frons narrow, in the narrowest part approximately 0.25 × as wide as the head width. Antennal fossa deep, with sculpture forming semicircular striae only in the basal half of fossa, interspaces shiny. Head mostly smooth or with diffused microreticulation, shiny, usually without striae or only frons close to frontal carinae with rudiments of striation and with fine median sulcus, gena with short, longitudinal striae. Surface covered with short and sparse, white appressed pubescence, especially around the eyes, sides of the head and occipital area but also in the frontal area. Frons on the sides with a pair of long erect setae, and a few short sparse, yellowish suberect and erect setae, occipital corners usually with

Figures 19–20. Head of *Messor syriacus* Tohmé (19) major worker, (20) minor worker (scale bar = 1 mm).

3–9 erect setae, between the frons and the occipitum a few suberect to erect setae also occur but the sides of the head and gena are without standing setae. Ventral part of the head with numerous, long erect setae, partly forming a J-shaped psammophores. Antennal scape moderately long, in frontal view almost straight, 0.7–0.8 × as long as the width of the head; base moderately extended, outer angle acute, inner angle rounded. Scape before its apex not constricted; funiculus distinctly longer than scape, pedicel moderately elongated, approximately 0.75 × as long as segments 2 and 3 combined and 1.2–1.3 × as long as segment 2 (Fig. 19). Surface of the scape smooth to diffusely microreticulated and shiny, covered with long and sparse white subdecumbent to suberect hairs. Mandibles rounded, with deep grooves, surface shiny with a few long and short yellow setae, cutting edge in large majors often with serrulate edge. **Mesosoma.** Moderately long, approximately 1.8–2.0 × as long as wide. Pronotum regularly convex in profile and on sides (Figs 15, 16). In lateral view promesonotum form regular convexity, propodeum positioned lower than the promesonotum, flat anteriorly then distinctly angulate posteriorly, angulation margined by short, thick carina lateral and often form small denticle (Figs. 16, 21, 22). Pronotal dorsum with strong transverse to slightly irregular striae, on the sides with distinct semicircular striae, interspaces shiny, sometimes posterolateral corners of pronotal sides with diffused striation. Elevated dorsum of mesonotum slightly irregular surface or short striae, posterior part and sides with longitudinal striae, interspaces shiny. Mesopleura with dense, thick transverse striae, interspaces with diffused microreticulation but appear shiny. Propodeum dorsally with thick transverse striae and around the spiracle with circular striae. Metapleura with dense, high longitudinal striae, interspaces on the whole propodeal surface smooth and shiny. Vestiture and setation of mesosoma



Figures 21–22. Color variation of *Messor syriacus* Tohmé (21) the palest form, (22) the darkest form (scale bar = 1 mm).

variable, pronotum with extremely sparse, short appressed hairs and dorsolaterally with 6–10 short to very long, white erect setae, the longest with a length up to 0.365 mm, sides of the pronotum without suberect setae, mesonotum with 12–16 long erect setae, only slightly shorter than the longest setae on pronotum, and with several short erect setae, propodeal dorsum usually only with a pair of long erect setae, slightly shorter than setae on mesonotum and with a few short erect setae, sometimes with 1–2 additional erect setae in its anterolateral corners and single seta at the base of the propodeal denticle, mesopleuron close to posterior margin without suberect setae, metapleuron in posterolateral corners with a group of moderately long suberect setae. **Petiole.** Elongate, with long pedicel and moderately high triangular node, thin, PI 1.29–1.57, pedicel, anterior face and base of the node with distinct reticulate sculpture, posterior face with strong longitudinal sculpture, top of the petiole obtusely angulate, upper margin and sides with 3–10 erect setae, the longest with a length of 0.254 mm (Figs 18, 21, 22). **Postpetiole.** Rounded in profile, globular in dorsal view, 1.2–1.3 × as wide as the petiole, whole surface with numerous erect setae, as long as setae on the petiolar node. **Gaster.** Whole surface with diffused microreticulation, shiny, covered with very sparse and short appressed hairs, first tergite without erect setae except for a row of short erect setae close to posterior margin, or in fresh specimens the base of the first tergite with a group of 2–7 very short erect setae, sometimes also posterolateral corners with 1–3 similar setae. **Legs.** Moderately elongate, FI 0.856–0.914, femora distinctly swollen in the middle, tibiae moderately widened apically, tarsi longer than tibiae. Whole surface of the legs diffusely microreticulate, covered with moderately dense and long, subdecumbent to erect setae.

The smallest minor worker: **Measurements.** HL: 1.13; HW: 1.02; SL: 1.05; EL: 0.24; PW: 0.70; PRL: 0.70; PRW: 0.51; PTL: 0.43; PTH: 0.28; WL: 1.49; HFL: 1.35; CI: 1.108; SI: 1.029; PI: 1.536; FI: 0.906; L/WI: 2.129; PRI: 1.373.

Color. Similar to majors but often head brown with reddish-brown spots, legs often yellowish-brown to brown (Figs 17, 18, 20). Antennae sometimes with reddish-brown scapi and slightly obscure funicle. **Head.** Slightly more elongated than in major workers,

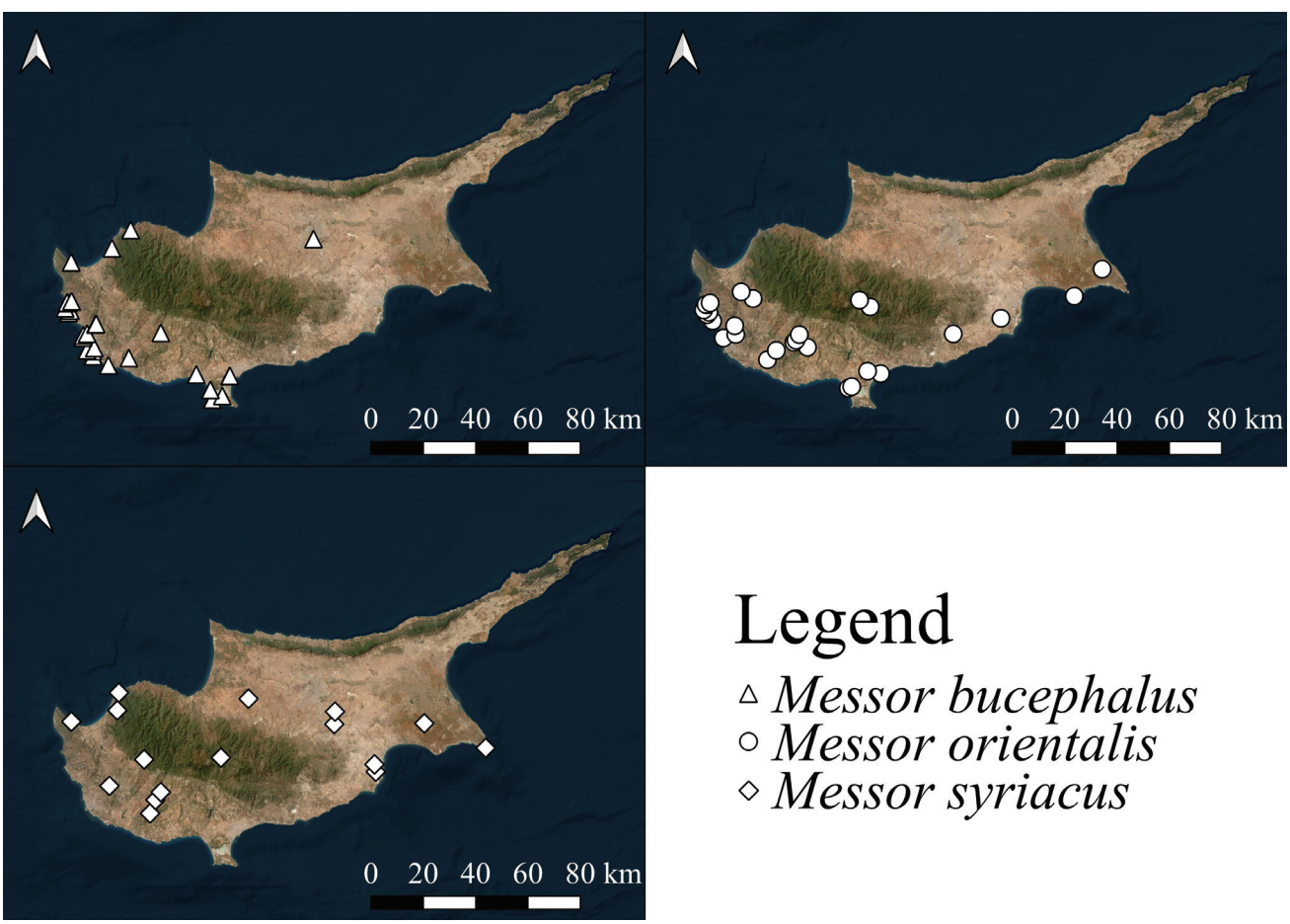


Figure 23. Distribution of *Messor* species in Cyprus.

approximately 1.1 × as long as wide, softly converging anterad and posterad, behind the eyes regularly rounded, occipital margin of the head slightly convex (Fig. 20). Clypeus not as strongly sculptured as in majors, central plate mostly without longitudinal striae, smooth and shiny. Eyes large but less oval than in major workers, 1.3 × as long as wide and 0.7 × as long as the gena. Frons smooth and shiny, without longitudinal striation, gena mostly smooth and shiny with very short striae at the anterior margin. **Mesosoma.** Slimmer than in majors, WL/PW ratio approximately 2.1. Dorsum of pronotal surface anteriorly with transverse striae, on the top with diffused striae or only irregular, sides mostly smooth and shiny except for remnants of semicircular striation. Sculpture of mesonotum and propodeum as in majors. Setation and vestiture of mesosoma as in majors but with less number of setae, especially mesonotum with only 4–6 erect setae, propodeum dorsum with only a pair of setae (Fig. 18). **Petiole and postpetiole.** As in major workers but the posterior face of the petiole without longitudinal striae. **Gaster.** Smooth and shiny or only with remnants of reticulate microsculpture, setation as in majors. **Legs.** Relatively longer than in majors, mean FI approximately 0.91, sculpture and setation as in major workers.

Biology. Thermophilous species, noted from low to mid altitudes, with most records from the seacoast to 400 m. The highest sites were in agricultural habitat with terraced crops at an altitude of 1325 m. Prefers sunny areas like dirt roadsides, salt lakes coasts, dry riverbanks, maquis and luminous pine forests with Mediterranean bushes, gravel areas on riverbanks and sunny rock with xerothermic meadow. Unlike the other two species of *Messor* known from Cyprus, it has not been observed in cities or in touristy beaches. Nests directly in the ground, workers penetrate small areas around the nest's entrance.

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