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Redescription of *Monomorium pallidum* Donisthorpe, 1918, revised status

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ABSTRACT. *Monomorium pallidum* Donisthorpe, 1918 is redescribed based on material from Iran (new country record). It is removed from the genus *Trichomyrmex* Mayr, 1865, its species status is retrieved and placed in the *M. monomorium* group of the genus *Monomorium* Mayr, 1855.

Keywords Iran, key, *Monomorium monomorium*-group, Palearctic Region, Middle East.
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INTRODUCTION

With 358 described species and 25 valid subspecies, *Monomorium* Mayr, 1855 is one of the largest myrmicine genera, which is distributed worldwide in tropical and warm temperate regions (Bolton 2018, Brown 2000). The majority of the Palearctic species occur in arid habitats, Mediterranean shrubs, steppes, semideserts and deserts. Most species inhabit the topsoil layer or leaf litter and are generalized foragers (Bolton 1987, Sharaf et al. 2018).

The genus has few regional revisions (Bolton 1987, Heterick 2001, 2006, Sharaf et al. 2018), but its taxonomic foundation is in a moderate stage. Especially the fauna of the Mediterraneo-Sindian region (Vigna Taglianti et al. 1999), with a large number of described infraspecific taxa, stands in need of further investigation (Borowiec 2014). Thanks to the most recent revision of the Arabian species of the *M. monomorium* group (Sharaf et al. 2018) the status of some problematic taxa has been finally clarified. However, there are still several *Momonorium* species from southwestern Asia with uncertain taxonomic status. *Monomorium pallidum* (Donisthorpe, 1918) was originally described as *M.* (*Paraholcomyrmex*) *destructor* var. *pallidus* from Amara (=Al-ʿAmārah), Iraq. Based on material studied by Donisthorpe and workers collected in the vicinity of Baghdad, Crawley (1920) confirmed species validity and affiliation with the nomino-

typical subgenus, and described the gyne caste. In his catalogue of world ants, Emery (1922) retained again the variety status. Pisarski (1967), based on material from Afghanistan, redescribed *M. pallidum* and considered this taxon as a subspecies of *M. destructor*.

Recently, *M. destructor* with other members of *M. destructor* and *M. scabriceps* groups, as defined by Bolton (1987), were placed in the genus *Trichomyrmex* Mayr, resurrected from synonymy under *Monomorium* (Ward et al. 2015). Thus, the current status of the name "*pallidus*" is a subspecies of *T. destructor* (Bolton 2018). Although Kugler (1988), Alpert and Martinez (2007), Vonshak and Ionescu-Hirsch (2010) and Borowiec (2014) treated the taxon as a good species under *Monomorium*, its affiliation to this genus has not been formally confirmed. An examination of syntype material of *M.* (*Paraholcomyrmex*) *destructor* var. *pallidus* Donisthorpe, 1918 and newly collected material in Iran revealed that Crawley's (1920) conclusions are correct and this taxon is a good species of the *M. monomorium* group. In this study, we redescribe the species based on the worker caste and recommend transferring *M. pallidum* from *Trichomyrmex* to *Monomorium*.

MATERIAL AND METHODS

Specimens were examined using methods of comparative morphology (Bolton 1987, Sharaf et al 2018). Photos were taken using a Nikon D5200 photo camera and Helicon Focus software attached to a Nikon SMZ 1500 stereomicroscope. All given label data are in original spelling; a vertical bar (|) separates data on different rows and double vertical bars (||) separate labels. The images of type specimens, with assigned CASENT number, are available at AntWeb (https://www.antweb.org). Examined specimens are deposited in the following collections:

BMNH Natural History Museum, London, UK;

DBET Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław, Poland;

SCUA Shahid Chamran University, Ahwaz, Iran.

Measurements and indices:

All measurements are in millimeters and follow the standard measurements used in previous works on the genus (Bolton 1987, Sharaf et al. 2018):

Measurements.

EL Eye Length; maximum diameter of eye in lateral view.

EM Distance between anterior margin of eye and mandibular insertion in lateral view.

HL Head Length; maximum length of head, excluding mandibles in full-face view.

HW Head Width; maximum width of head behind eyes in full-face view.

ML Mesosoma Length (=Weber Length); length of mesosoma in lateral view, measured from a point at which pronotum meets cervical shield to posterior base of propodeal lobes or teeth.

PPH Postpetiole Height; maximum height measured in lateral view.

PPL Postpetiole Length; maximum length measured in dorsal view.

PPW Postpetiole Width; maximum width measured in dorsal view.

PTH Petiole Height; maximum height measured in lateral view.

PTL Petiole Length; maximum length measured in dorsal view, from anterior margin to posterior margin.

PTW Petiole Width; maximum width measured in dorsal view.

PW Pronotal Width; maximum width in dorsal view.

SL Scape Length, excluding basal neck.

TL Total Length, sum of lengths of head, mesosoma, petiole, postpetiole and gaster in lateral view.

Indices.
CI Cephalic Index (HW/HL × 100).
EI Eye Index (EL/HW × 100).
SI Scape Index (SL/HW × 100).

RESULTS

Monomorium pallidum Donisthorpe, 1918 status revised (Figs. 1-3)

Monomorium (*Paraholcomyrmex*) *destructor* var. *pallidus* Donisthorpe, 1918: 166.

Monomorium (*Monomorium*) *pallidum*: Crawley 1920: 178.

Monomorium (*Paraholcomyrmex*) *destructor* var. *pallida*: Emery 1922: 180.

Monomorium destructor pallida: Pisarski 1967: 48.

Monomorium pallidum: Borowiec 2014: 123.

Trichomyrmex destructor pallidus: Bolton 2018: AntCat.

Material examined

Type material: lectotype (here designated): Amara | Mesopotamia | (Evans) || *pallidus* Donis. || SYNTYPE || ex coll. | Donisthorpe. | B.M.

Figs 1 – 2. *Monomorium pallidum* Donisthorpe worker (scale bar – 0.5 mm). Fig. 1 – body in dorsal view, Fig. 2 – body in lateral view.

1934-4. || BMNHE | 1015255 || ANTWEB | CASENT0902219 (BMNH) [examined]; all other syntypes from Amara preserved in BNMH have to be considered as paralectotypes.

Other material: 31 workers (19 in alcohol): IRAN, Khuzestan Prov. | Shoosthar | 11.v.2017 | Mossadegh ant group (DBET, SCUA); 6 workers: IRAN, Khuzestan Prov. | Ahvaz-M.I.S., Hoda' Park, 4.v.2017 | Mossadegh ant group (DBET, SCUA).

Fig. 3. *Monomorium pallidum* Donisthorpe worker (scale bar – 0.25 mm), head in full-face view.

Description

Measurements: HL: 0.57 ± 0.02 (0.55-0.6), HW: 0.45 ± 0.01 (0.43-0.47), SL: 0.5 ± 0.02 (0.47-0.53), EL: 0.11 ± 0.008 (0.1-0.12), EM: 0.13 ± 0.009 (0.11-0.14), ML: 0.68 ± 0.03 (0.63-0.72), PTL: 0.23 ± 0.01 (0.21-0.25), PPL: 0.15 ± 0.01 (0.14-0.17), PTH: 0.19 ± 0.007 (0.17-0.2), PPH: 0.17 ± 0.007 (0.16-0.18), PW: 0.29 ± 0.01 (0.27-0.31), PTW: 0.14 ± 0.01 (0.12-0.16), PPW: 0.18 ± 0.009 (0.16-0.19), TL: 2.3 ± 0.06 (2.2-2.4), Indices: CI: 79.1 ± 1.7 (76.6-81.8), SI: 110.5 ± 4.0 (105.6-119.4), EI: 24.9 ± 1.6 (22.2-27.8) (n=10).

Head. In full-face view approximately 1.3 times longer than broad with shallowly convex sides and straight or shallowly concave posterior margin in full-face view; median clypeal portion without carina or anterolateral angles, anterior clypeal margin feebly concave; antenna 12-segmented; scapes moderately long, when laid straight back, reaching or slightly surpassing posterior margin of head, antennal club feebly but distinctly defined; mandibles armed with four teeth, decreasing in size from apex to base; eyes oval, moderate, placed distinctly in front of the midlength of head, with six to seven ommatidia in the longest row; frontal lobes farther apart in full-face view. **Mesosoma**. In lateral view with regularly convex promesonotal dorsum, which slopes posteriorly to a deep metanotal groove; propodeal spiracles small and circular; propodeal dorsum evenly sloping posteriorly to short declivity. **Petiole.** Node massive, narrowly rounded above, and as high as postpetiolar node in lateral view; anterior peduncle moderately long; ventral petiolar surface below node only slightly convex extending anteriorly to form a small dent; petiolar spiracle located in anterior sector of node. **Postpetiole.** Node large with convex dorsal margin; postpetiole slightly broader than high. **Sculpture.** Cephalic surface smooth and shining, only a few fine wrinkles curve posteriorly around the fossa; mandibles smooth and shining, sometimes with feeble longitudinal striation; pronotal dorsum smooth and shiny, sides with diffused striation and microreticulation but shiny; meso-and metapleuron finely microreticulate-punctate including dorsum of propodeum, without cross ribs; peduncle of petiole ventrally and dorsum of petiole and postpetiole with scattered microreticulation, appear shiny, sides of petiole and postpetiole distinctly shagreened but shining; gaster smooth and shining. **Pilosity.** Frontal part of head and posterior margin of head with four long erect hairs, anterior clypeal margin and mandibles with longer hairs, underside of head with numerous erect hairs only slightly shorter than hairs on front of head, pronotum with a pair of long hairs, meso- and metanotum without hairs only with sparse appressed pubescence; cephalic surface with scattered minute hair-pits; antennae with abundant appressed hairs; petiole and postpetiole with a pair of long hairs; gaster with numerous longer hairs on the first tergite, appressed pubescence absent. **Color.** Uniform clear yellow, in most specimens first gastral tergite apically with a pair of small brown patches of diffused borders, mandibular teeth brown.

DISTRIBUTION

Iraq (Baghdad and Majsan Provinces), Iran (Khuzestan Province), Israel & Palestine (Jordan Valley and southern Golan, Central Coastal Plain, Southern Coastal Plain and Golan Heights regions). Recorded also from Afghanistan (Kandahar Province), but based on the description provided by Pisarski (1967) this record refers to different species. The species is a new record to Iran.

COMPARATIVE NOTES

Based on general morphology *M. pallidum* have most of the characters of the *M. monomorium* group as defined by Bolton (1987) and Sharaf et al. (2018): monomorphic, with size variation but without allometric variation; median clypeal portion raised, projecting anteriorly and longitudinally bicarinate; anterior clypeal margin without a pair of teeth; dorsal surface of mandibles unsculptured and masticatory margin armed with four distinct teeth, decreasing in size from apex to base; antennae with 12 segments, terminating in a well-defined three-segmented club; eyes present, situated in front of the midlength of the sides in full-face view, with more than four ommatidia in the longest row; head longer than broad; cephalic dorsum smooth and shining; metanotal

groove impressed; propodeal spiracle circular; propodeal dorsum meeting declivity in a rounded angle; promesonotum and propodeal dorsum unsculptured; head, pronotum and first gastral tergite with erect hair; petiole and postpetiole partly and gastral tergites completely unsculptured.

However, *M. pallidum* can be distinguished from other members of the *M. monomorium* species-group in metanotal groove lacking cross-ribs and finely sculptured propodeal dorsum. The latter feature is also characteristic for *Monomorium sarawatense*, species included in the revision of the *M. monomorium* species-group (Sharaf et al. 2018). Also, similar to *M. sarawatense*, *M. pallidum* has head with fine sculpture surrounding fossa. It can indicate that those taxa are closely related and create a separate unit within the *M. monomorium* group.

There are six species of the *M. monomorium* species-group known from Arabian Peninsula (Sharaf et al. 2018). Four of them, *M. aeyade* Collingwood & Agosti, *M. clavicorne* André, *M. exiguum* Forel and *M. mohammedi* Sharaf & Hita Garcia differ from *M. holothir* Bolton, *M. sarawatense* Sharaf & Aldawood and *M. pallidum* in 11-segmented antennae. Among three species with 12- segmented antennae *M. sarawatense* differs in clubbed body setae, while *M. holothir* and *M. pallidum* have simple body setae. *Monomorium holothir* differs in dorsum of mesosoma with numerous erect setae and petiole and postpetiole completely smooth and shining while *M. pallidum* has only a pair of erect setae on pronotum and sides of petiole and postpetiole with reticulate microsculpture. Both, *M. holothir* and *M. sarawatense*, have gaster uniformly yellow to yellowish-brown, while in *M. pallidum* in most specimens occur brown spots in apical part of first gastral tergite.

The discussed characters for *Monomorium pallidum* indicate that perhaps the redescription of this taxon given by Pisarski (1967) concerns another species. He noted this taxon as uniformly yellow while lectotype and all recently studied specimens have distinct brown spot on each side of first gastral tergite.

In the key to the Arabian *M. monomorium* group proposed by Sharaf et al. (2018) *M. pallidum* runs to couplet 2 and the key is modified as follow:

2. Body pilosity clubbed; mesosoma, petiole and postpetiole distinctly sculptured (Fig. 4A in Sharaf et al. 2018) ....*M. sarawatense* Sharaf & Aldawood

-. Body pilosity simple; mesosoma, petiole and postpetiole smooth and shining (Fig. 4B in Sharaf et al. 2018) or with reticulate-punctate sculpture on their sides (Figs. 1-2) ..... 3.

3. First gastral tergite uniformly yellow to yellow-brown, dorsum of mesosoma with numerous erect setae, petiole and postpetiole completely smooth and shining (Fig. 8 in Sharaf et al. 2018) .....*M. holothir* Bolton

-. First gastral tergite with brown spots on its posterolateral part, dorsum of mesosoma with two erect setae on pronotum, sides of petiole and postpetiole with reticulate-punctate microsculpture (Figs. 1-2) .....*M. pallidum* Donisthorpe

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