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## ORIGINAL ARTICLE

# New Records of Unidentified Ants worker (Hymenoptera: Formicidae: Myrmicinae) stored in Iraqi Natural History Museum with key to Species

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**ABSTRACT**
*Nine species of stored collection specimens of unidentified ant worker, (Hymenoptera: Formicidae: Myrmicinae), Crematogaster auberti Emery; C. luctans Forel; Messor buettikeri Collingwood; M. minor (André); M. picturatus Santsch; M. striaticeps (André); Monomorium carbonarium (Smith); Mon. Pharaonis (Linnaeus); Pheidole minuscula Bernard, are recorded from Iraqi Natural History Museum for the first time. New key with figures are presented here for the separation of these workers.*
***Key words**: New records, Iraqi ants' fauna, Formicidae, Myrmicinae*

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## INTRODUCTION

The family Formicidae includes about 300 genera belonging to 20 extant Subfamilies [1] more than 12.000 species have been described worldwide [2]. As thermophiles, ants are distributed mainly in the tropical and subtropical carried out in several parts of Asia , where species richness and abundance of this family may be overwhelming. Ants have colonized almost every landmass on Earth, they thrive in most ecosystems, and may form 15-25% of the terrestrial animal biomass [3]. Their success has been attributed to their social organization and their ability to modify habitats, tap resources, and defend themselves [4,5]. Invasive species use man-made transport networks for their global dispersal and often damage native ecosystems by their high rates of population growth after introduction [6].

Myrmicinae is the one largest subfamily in the Formicidae, it includes about 140 genera within the group, with the family being cosmopolitan [7]. Myrmicine worker ants have a distinct postpetiole, abdominal segment III is notably smaller than segment IV and set off from it by a well developed constriction; the pronotum is inflexibly fused to the rest of the mesosoma, such that the promesonotal suture is weakly impressed or absent; and a functional sting is usually present. The clypeus is well developed; as a result the antennal sockets are well separated from the anterior margin of the head. Most myrmicine genera possess well developed eyes, and frontal lobes that partly conceal the antennal insertions (8).

Much faunastic research on ants has been carried out in several parts of Asia, example East and Southeast Asia [9, 10, 11], India [12], central Asia [13, 14], Saudi Arabia [15, 16]. The ant fauna of other countries from this region, including Iraq, has been investigated only partly and restricted on checklists such as [17, 18, 19].

Generally, the aim of present study that identify of myrmicinae workers with a key to genera and species in Iraq.

## MATERIAL AND METHODS

We used the material (125 specimens) deposited from the non identification collection of Iraq natural history museum at Baghdad university. Morphological observation were made with a dissecting microscope and figured by a Sony, Cyper- shot, EXMOR R 10.2Megapixls digital camera.

In preparation of genera and species keys, the many publications used [15,16] and formulated to accordant with species of Iraq.

**Key to genera and species of the subfamily Myrmicinae:**

1- Postpetiole attached mediodorsally to first gaster tergite (fig. 1a); gaster cordiform from above (fig. 1b)…… ***Crematogaster*** Mayr……..……2

-Postpetiole attached medioventrally to first gaster tergite (fig. 1e); gaster pyriform from above (fig. 1f); ……3

2- Postpetiole globular, not bilobed (fig. 1c); colour yellow……***C. luctans*** Forel

-Postpetiole divided dorsally by median longitudinal furrow into two lobes (fig. 1g); colour brown to dark brown……..***C. auberti*** Emery

3- Antenna with four apical segments elongated and slightly enlarged to form a somewhat indistinct club (fig. 1d)……..***Messor*** Forel……4

-Antenna with three apical segments enlarged to form a distinct club (fig. 1h)…….14

4- Gula with short moderately curved hairs not forming psammophore (fig. 2a) ……..***M. orientalis*** (Emery)

-Gula with long anteriorly curved hairs forming a distinct psammophore (fig. 2e)…….5

5- First gaster tergite conspicuously hairy with long pale hairs (fig. 2b)……6

-First gaster tergite with few short hairs or none (fig. 2f)……..7

6- Head red or dark red contrasting with dark brown alitrunk and gaster……***M. decipiens*** Santschi

-Unicolorous black or dark or brownish black species……***M. buettikeri*** Collingwood

7- Unicolorous black……..8

-Bicoloured species with head or alitrunk or both reddish, contrasting with darker Gaster……9

8- Propodeum dentate (fig. 2f); head closely sculptured with fine striae (fig. 2c)……***M. striaticeps*** (Andre)

-Propodeum angled but never dentate (fig. 2d); head smooth and shining (fig. 2g) ……***M. ebeninus*** Santschi

9- Head and gaster darker than alitrunk……10

-Head and alitrunk red or brownish red contrasting with dark gaster……..12

10- Propodeum rounded (fig. 2h); head width < 1.5 mm……***M. syriacus*** Santschi

-Propodeum angulated (fig. 2d); head width > 1.5 mm……11

11- First gaster tergite with some short erect hairs; occiput with at least six projecting hairs on each side of median occipital impression (fig. 3a)…… ……***M. mediorubra*** Cangniant

-First gaster tergite hairless; occiput less than three hairs on each side of median occipital impression or none (fig. 3e)…… ***M. meridionalis*** (Andre)

12- Maximum head width 2.5mm or more; head bright yellowish red…… ……***M. semirufus*** (Andre)

-Maximum head width 2.0mm or less; head red ……13

13- Occiput smooth; head bright red…… ***M. minor*** (Andre)

-Dorsum of head completely sculptured to occiput; head and alitrunk brownish red ……..***M. picturatus*** Santschi

14- Clypeus longitudinally bicarinate (fig. 3b); propodeum without spines or teeth (fig. 3c)…… ***Monomorium*** Mayr……..15

-Clypeus with median portion rounded or flat (fig. 3f); propodeum bituberculate or with spines or teeth (fig. 3g) ……18

15- Ultimate flagellar segment as long as the two preceding together, the first of the three segments forming the club being shorter than second (fig. 3d)……..16

-Ultimate flagellar segment shorter than the length of the preceding two together which are subequal (fig. 3h)……17.

16- Head and alitrunk with close punctulate microsculpture, dull not shining……***Mon. pharaonis*** (Linnaeus)

-Head and alitrunk at least moderately shining; colour uniformly blackish brown ……***Mon. carbonarium*** (smith)

17- Body colour brownish to brownish black……***Mon. karawajewi*** Forel
-Head and alitrunk pale reddish brown……***Mon. gracillimum*** (smith)

18- Clypeus raised into a ridge in front of antennal insertions (fig.4a) ……***Tetramorium*** Mayr.
-Clypeus not raised into a ridge in front of antennal insertions (fig. 4b)……***Pheidole*** Westwood .19.

19- Head width less than1.00 mm; head rectangular clearly longer than wide ……***Ph. minuscula*** Bernard
-Head width greater than 1.35 mm; head sides curved not or scarcely longer than broad……***Ph. sinaitica*** Mayer

Genus ***Crematogaster*** Lund, 1831

*Crematogaster* is an ecologically diverse genus of ants found worldwide, which are characterized by a distinctive heart-shaped gaster (fig. 1b), which gives one of their common names, Valentine Ant. Members of this genus are also known as Cocktail ants because of their habit of raising their abdomens when alarmed. It is the only genus of the tribe Crematogastrini, most of species are arboreal [20].

***Crematogaster auberti*** Emery, 1869

*Crematogaster auberti* Emery, 1869: Annls Accad. Aspir. Nat. Npoli 2:23.

**Materials**: Erbil, Shaqlawa: two specimens, 10.VII.1968.

**Distribution**: North Africa, South Europe, Saudi Arabia, newly recorded in Iraq.

***Crematogaster luctans*** Forel, 1907

*Crematogaster luctans* Forel, 1907; Annls. Hist. Nat. Mus. Natn. Hung. 5:22.

**Materials**: Baghdad: three specimens,1.IV.1971; Sulimanyia, Darbandikhan: one specimens, 8.VII.1971.

**Distribution**: Tropical Africa, Saudi Arabia, newly recorded in Iraq.

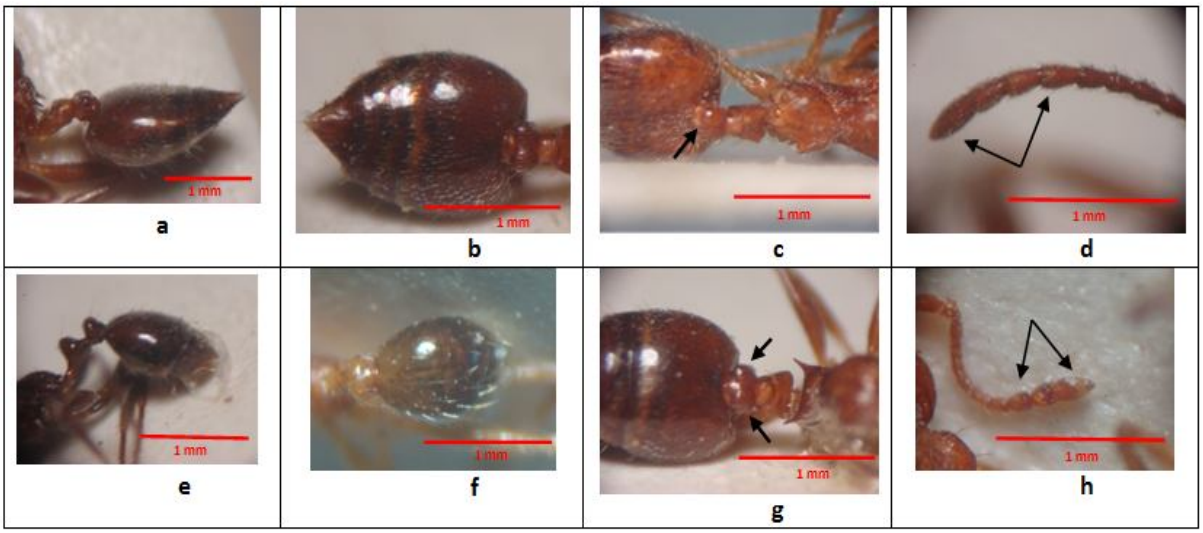



**Figure (1)** a: *Crematogaster* ; b: *C. auberti*; c: *C. luctans*; d, e: *Messor*; f: *Pheidole* g: *C. auberti* ; h:*Pheidole*

Genus ***Messor*** Forel, 1890

*Messor* is a myrmicine genus of ants with more than 100 species, all of which are harvester ants. The subterranean colonies tend to be found in open fields and near roadsides, openings are directly to the surface. Colonies can achieve huge sizes and are notable for their intricately designed granaries in which seeds are stored in dry conditions, preventing germination. Characters species of this genus are considered to be of most value include relative eye size, dorsal pilosity, especially that of the first gasteral tergite, and the presence or absence of long J- shaped hairs on the ventral head surface referred to here as a psammophore (fig. 2e). The shapes of the petiole and postpetiole are also important. Sculpture is rather variable in member of this genus [15].

***Messor aralocaspius*** (Ruzsky , 1902)

*Aphaenogaster barbara* var. *aralocaspius* Ruzsky,1902; Ants of Lake Aral; 20 .

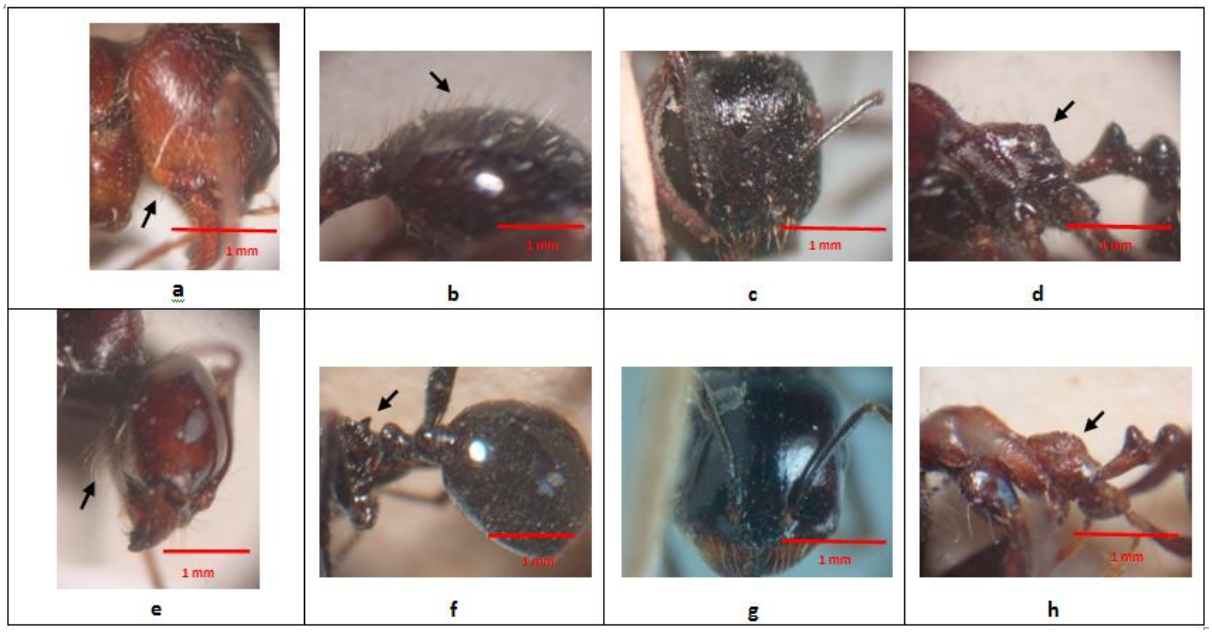
*Messor aralocaspius* (Ruzsky) Pisarski, 1967; Annls. zool. Warsz. 24:384.

**Materials**: Erbil, Galala: two specimens,11.XI.1979.

**Distribution**: South East Europe, Saudi Arabia , Iraq.

***Messor buettikeri*** Collingwood, 1985
*Messor buettikeri* Collingwood,1985; *Fauna of Saudi Arabia,* 7:249 .
**Materials**: Erbil, Guman: four specimens, 11.XI.1979.
**Distribution**: Saudi Arabia , newly recorded in Iraq.
***Messor decipiens*** Santschi, 1917
*Messor capensis* st. *decipiens* Santschi, 1917; Bull. Soc. Hist. Nat. Afr. N. 8:94.
**Materials**: Duhok: three specimens, 25.VI.1979; Diyala, Adhaim: two specimens,18. IV.1971.
**Distribution**: South and East Africa, Saudi Arabia, Iraq.
***Messor ebeninus*** Santschi, 1927
*Messor semirufus* var. *ebeninus* Santschi, 1927; Boln. Soc. Esp. Hist. Nat. 27:229.
**Materials**: Diyala, Adhaim: one specimen, 27. III.1977, Al- Sadiya: One specimen, 18.IV.1979; Duhok: nine specimens, 25.VI.1979; Baghdad, Jaddria: one specimen, 15.V.1979; Wassit, Kut: two specimens, 9.IV.1979; Saladin, Baiji: one specimen, 24.VI.1979.
**Distribution**: Middle East.

**Figure (2)** a: *Messor orientalis*; b: *M. decipiens*; c, f: *M. striaticeps*; d, g: *M. ebeninus*; e: *M. decipiens* ; h: *M. syriacus*




***Messor mediorubra*** Cagniant, 1969
*Messor mediorubra* Cagniant, 1969, Bull. Hist. Nat. Toulouse 105: 415.
**Materials**: Baghdad, Jaddria: three specimens,15.V.1979.
**Distribution**: North Africa, Saudi Arabia, Iraq.
***Messor meridionalis*** (André, 1882)
*Aphaenogaster barbara* var. *meridionalis* André, 1882; Spec. Hym. Europe 2: 353.
*Messor meridionalis* (André) Bondroit, 1918; Annls. Soc. Ent. Fr. 87:155.
**Materials**: Erbil, Salahuldin: three specimens, 27.V.1979; Duhok, Ara'den: two specimens, 26. VI.1979; Baghdad, Jaddria: three specimens, 15.V.1979; Wassit, Aziziya: one specimen, 9.IV.1979.
**Distribution**: Central Asia, Middle East.
***Messor minor*** (André, 1882)
*Aphaenogaster barbara* var. *minor* André, 1882; Spec. Hym. Europe 2: 355.
*Messor minor* (André) Kutter, 1927; Folia Myrm. et Term. 1:99.
**Materials**: Sulimanyia, Darbandikhan: six specimens, 8.VII.1971; Diyala, Adhaim: two specimens,18.VI.1971.
**Distribution**: North Africa, South Italy, Saudi Arabia, newly recorded in Iraq.
***Messor orientalis*** (Emery,1896)
*Stenamma* (*Messor*) *structor* var. *orientalis* Emery, 1896; Öfvers. Finska Vetensk Soc. Förh. 29:20.
*Messor orientalis* (Emery) Collingwood, 1960; Vidensk. Meddr. Dansk Naturh. Foren 123:62.
**Materials**: Erbil, Hassarost: three specimens ,13.VII.1971.
**Distribution**: Middle East, South East Europe.

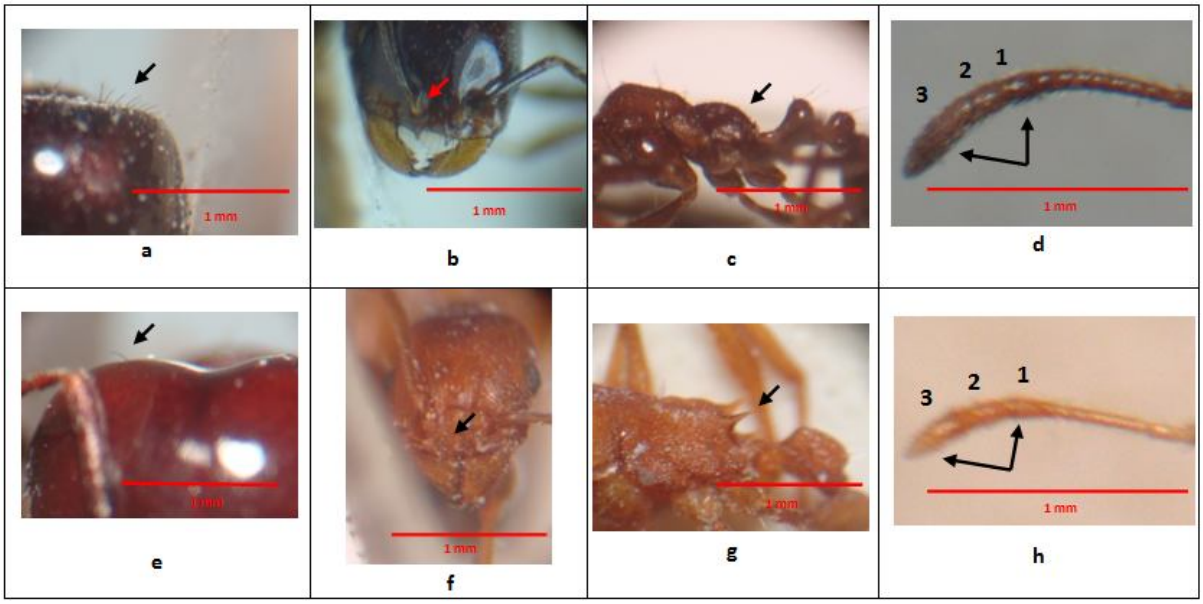



**Figure (3)** a: *Messor mediorubra*; b:*Monomorium*; c: *Mon. karawajewi*; d: *Mon. pharaonis*; e: *Messor meridionalis* ; f, g: *Pheidole* h:*Mon. carbonarium*

***Messor picturatus*** Santschi, 1927
*Messor picturatus* Santschi, 1927; Revue suisse Zool. 30.
**Materials**: Sulimanyia, Darbandikhan: four specimens, 8.VII.1971.
**Distribution**: North Africa, Saudi Arabia, newly recorded in Iraq.
***Messor semirufus*** (André,1882)
*Aphaenogaster barbara* var. *semirufa* André, 1882; Spec. Hym. Europe 2:355.
*Messor semirufus* André Santschi, 1927; Boln. Soc. Esp. Hist. Nat. 27:232.
**Materials**: Duhok, Ara`den: two specimens, 26.VI.1979.
**Distribution**:Middle East.
***Messor striaticeps***(André,1882)
*Aphaenogaster barbara* var. *striaticeps* André, 1882; Spec. Hym. Europe 2: 356.
*Messor striaticeps*(André) Cagniant, 1969; Bull. Soc. Hist. Nat. Toulouse 105: 415.
**Materials**: Kerbela, Akhaider: three specimens, 5. III.1977.
**Distribution**: North Africa, Saudi Arabia, newly recorded in Iraq.
***Messor syriacus*** Santschi, 1927
*Messor laboriosa* var. *syriacus* Santschi, 1927; Boln. Soc. Esp. Hist. Nat. 27:240.
**Materials**: Diyala, Adhaim: five specimens, 18. IV.1971, Sulimanyia, Darbandikhan: one specimen, 8.VII.1971; Duhok: one specimen, 8.XI.1979.
**Distribution**: Middle East.

Genus ***Monomorium*** Mayr, 1855
The genus Monomorium is assigned to the Solenopsis genus group of the tribe Solenopsidini [21]. The concept of the genus was revised by [22], and was recently widened by [23, 24]. Two very important characters that were overlooked in (15) but brought out in the comprehensive review by [22] are the presence, disposition or absence of hairs on the alitrunk dorsum and relative eye size.
While the worker caste is monomorphic in some species, in others it is polymorphic. In some species the workers are minute, in others they are rather large. Large, multifaceted eyes are common, but *M. inusuale* has much reduced eyes, as do some species from Africa. 36 species are described from Madagascar, 19 of these were described in 2006 alone; 43 species are known from Australia, 30 from Arabia [25].
***Monomorium carbonarium*** (Smith, 1858)
*Myrmica carbonarium* Smith, 1858; Cat. Hym. Brit. Mus. 6:127.
*Monomorium carbonarium*(Smith) Roger, 1863; Berl. Ent. Z. 7:31.
**Materials**: Baghdad, Rashdiya: two specimens, 4. IV.1983; Basrah: three specimens, 10.IV.1979.
**Distribution**: Medeira, Azores, Saudi Arabia, newly recorded in Iraq.
***Monomorium gracillimum***(Smith, 1861)
*Myrmica gracillimum* Smith, 1861; J. Proc. Linn. Soc. London 6:34.
*Monomorium gracillimum* (Smith) Mayr, 1862; Verh. zool. bot. Ges. Wien 12:753.

**Materials**: Baghdad: five specimens, 20. V.1968.
**Distribution**: Cosmopolitan.
***Monomorium karawajewi*** Forel, 1913
*Monomorium gracillimum* var. karawajewi Forel, 1913; Revue. Suisse Zool. 21: 437.
**Materials**: Baghdad: two specimens, 20. V.1968; Erbil, Galala: one specimen, 10.VII.1971; Sulimanyia ,Shaqlawa: two specimen, 10.VII.1968.
**Distribution**: Middle East.
***Monomorium pharaonis*** (Linnaeus, 1758)
*Formica pharaonis* Linnaeus,1758; Syst. Nat. Ed. 10,1: 580.
*Monomorium pharaonis* (Linn.) Mayr, 1862; Verh. zool. bot. Ges. Wien 12:752.
**Materials**: Baghdad, Rashdiya: two specimens, 4. IV.1983.
**Distribution**: Cosmopolitan, newly recorded in Iraq.

Genus ***Pheidole*** Westwood, 1839
The workers are two sizes in this genus, major and minor. The major workers have very large heads with expanded occipital lobes and much bigger overall than the narrow headed minor workers. Since the major workers with their exaggerated structures show much clearer discriminatory characters in form and sculpture compared with minor workers. There are a large number of described forms on the African continent but considerably fewer in the Middle East [15].
***Pheidole minuscula*** Bernard, 1951
*Pheidole minuscula* Bernard,1951; Mém. Inst. Fr. Afr. Noire 11:226.
**Materials**: Kerbela, Razzaza Lake: 31 specimens, 5. III.1977.
**Distribution**: North west africa, Saudi Arabia, newly recorded in Iraq .
***Pheidole sinaitica*** Mayr,1862
*Pheidole sinaitica* Mayr,1862; Verh. zool. bot. Ges. Wien 12:745.
**Materials**: Baghdad, Karrada: two specimens, 9. VI.1989, three specimens, 18.V.1979 .
**Distribution**: North africa, Egypt, Saudi Arabia, Iraq.

Genus ***Tetramorium*** Mayr, 1855
***Tetramorium*** is one of the largest genera within the tribe Tetramoriini and is one of the most species rich genera with 477 species [26]. The genus has a worldwide distribution with varying species richness among different zoogeographical regions. The greatest number of species 230 has been reported from the Afrotropical region, whereas there are only very few [13] known from the New World. The genus has a good representation in the Palaearctic, Oriental, Malagasy and Indo-Australian regions, although much less compared to the Afrotropical region [27].
***Tetramorium depressiceps*** Menozzi, 1933
*Tetramorium semilaeve* ssp. *depressiceps* Menozzi, 1933; Memorie Soc. Ent. Ital. 12: 71.
**Materials**: Kirkuk, Belekan: two specimens, 26.V.1979.
**Distribution**: North East Africa, Middle East.

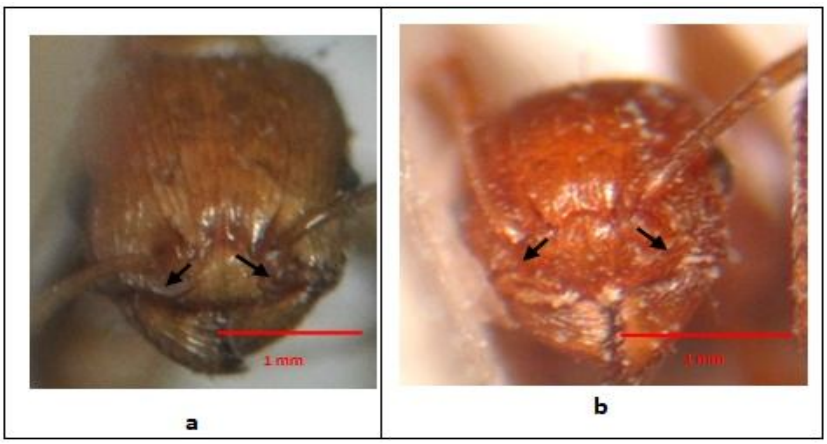



**Figure (4)** a: *Tetramorium* ; b: *Pheidole*

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