ASIAN MYRMECOLOGY Volume 7, 113 – 127, 2015
ISSN 1985-1944 © Afsane Hosseini, Mehdi Modarres Awal and Mojtaba Hosseini

New faunistic records of Formicidae (Insecta: Hymenoptera) from Iran's Northeast

Afsane Hosseini, Mehdi Modarres Awal, Mojtaba Hosseini*

Department of Plant Protection, College of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran

*Corresponding author's e-mail: m.hosseini@um.ac.ir

ABSTRACT. The ant fauna in two northeastern province of Iran (Khorasan-e-Razavi and Khorasan-e-Shomali) was surveyed in 2003, 2005 and 2013. A total of 10 species belonging to 6 genera were identified; of which two species, *Tetramorium sulcinode* Santschi, 1927 and *Tetramorium feroxoide* Dlussky & Zabelin, 1985, were newly recorded for the Iranian ant fauna. By adding these two new records, the total number of ant species recorded from Iran has increased to 183.

Keywords: Ant, Khorasan-e-Razavi, Khorasan-e-Shomali, Iran

INTRODUCTION

Iran is a vast plateau (1.6 million km^2) with diverse climatic and ecological zones disposed to having rich ant fauna. The first reports of ants from Iran were presented by the pioneer myrmecologists during the early 20th century. For example, Forel (1904 a, b) studied 10 ant species from the north, northwest, south and southeast of Iran, Crawley (1920 a, b) recorded nine species from the north, northwest and south of Iran, and Menozzi (1927) reported only three species from the north and south of Iran. After a long pause, relative large-scale investigations on the ant fauna of the country began in the mid 90's, which have continued until now (Ardeh 1994; Radchenko 1994; Alipanah *et al.* 1995; Paknia 2006; Firouzi *et al*. 2011; Hossein Nezhad *et al.* 2012; Shiran *et al*. 2013, Khandehroo et al. 2015 - this issue of Asian Myrmecology).

The Khorasan-e-Razavi and Khorasan-e-Shomali provinces have national parks (e.g. Tandoureh), protected areas (e.g. Sarigol), mountain chains (e.g. Hezar Masjed and Binalood) and many unexplored arid, semi-arid and steppe lands (e.g. the northeastern cross-border area) which are rich in biodiversity. Despite the high levels of biodiversity, only 14 ant species have been recorded from these provinces (Forel 1904a; Radchenko 1996; Kiran *et al.* 2013).

The most speciose genera in Iran as well as in Khorasan-e-Razavi and Khorasan-e-Shomali are *Componotus* and *Catalygphis* (Paknia *et al.*, 2008). *Tetramorium* Mayr, 1855 is species-rich in the Palearctic region (Csosz *et al*., 2007; Kiran & Karaman, 2012), however, a few species from the genus have been recorded until now for Iran and only one species, *T. inerme* for the above regions (Paknia *et al.*, 2008).

Moreover, most studies of Formicidae in Iran have focused on the north, the northwest and the south regions of Iran (Paknia & Kami 2007; Paknia *et al.* 2008). Thus, compared to the other areas of the country, faunistic study of Formicidae in north-eastern Iran has suffered from relative neglect.

Thus, we investigated the ant fauna of the two northeastern Iranian provinces, namely Khorasan-e-Razavi and Khorasan-e-Shomali, which represent a large proportion of Iran's semi-arid regions.

Materials and Methods

The specimens used in this study were collected in different areas of Khorasan-e-Razavi and Khorasan-e-Shomali in 2003, 2005 and 2013 (Figure 1). The surveyed areas were mostly non-urban, including pastures, semi-arid and agricultural lands. Sampling was carried out by hand during spring and summer. The collected materials were transferred into 75% alcohol in 1.5 ml. glass vials. For identification of the specimens at genus level, the keys presented by Bolton (1994) and Collingwood *et al*. (2011) were used. Samples were also sent to Sandor Csosz (Eötvös Loránd University, Hungarian Natural History Museum, Budapest, Hungary) and Kadri Kıran and Celal Karaman (Trakya University, Turkey) for confirmation. All material but one species was deposited in the Insect Collection of Plant Protection Department at Ferdowsi University of Mashhad (ICFUM); the species *Tetramorium* sp.IR-Kashmar-01 (*chefketi*-complex) was kept in the Hungarian Natural History Museum (HNHM). Pictures were taken using an Olympus DP-71 camera attached to an Olympus SZH-10 stereomicroscope.

RESULTS

Subfamily Myrmicinae Lepeletier de Saint-Fargeau, 1835

Genus *Tetramorium* Mayr, 1855

Tetramorium sulcinode Santschi, 1927 (Figs 2-4)

Tetramorium caespitum var. *sulcinode* Santschi, 1927 [original description].

Tetramorium caespitum sulcinode: Pisarski, 1970 [subspecies of *T. caespitum*].

Tetramorium sulcinode: Csosz, Radchenko & Schulz, 2007 [raise to species].

Material examined. 6 workers, steppe land, Shirvan city (37.3877 °N, 57.9394 °E), Khorasan-e-Shomali province, 1093 m a.s.l., 27.iii.2005, leg. A. Hosseini, det. Sandor Csosz.

Distribution. Outside of Iran, *Tetramorium sulcinode* is recorded from Afghanistan, Pakistan and Turkmenistan (Csosz *et al*. 2007). This is a new record for Iran.

Remarks. The following characters distinguish *Tetramorium sulcinode* from the other *Tetramorium* species in Iran: head and gaster brown, mesosoma yellowish brown, antennae and legs lighter than mesosoma in color; in dorsal view, spiracles on lateral margins of metanotum; propodeum with short black spines; body surface with light sparse pubescence which more condensed in anterior part of head and gaster; median portion of clypeus more outstanding in comparison with the other *Tetramorium* species. Petiole more protruding than postpetiole. The second segment of gaster with transverse and light strips.

Tetramorium feroxoide Dlussky & Zabelin, 1985 (Figs 5-7)

Tetramorium feroxoides Dlussky & Zabelin, 1985 [original description].

Tetramorium feroxoide: Csosz & Schulz, 2010 [redescription].

Material examined. 2 gynes, semi-arid land, Sabzevar city (36.1965 °N, 57.6679 °E), Khorasan-e-Razavi province, 948 m a.s.l., 10.vi.2013, leg. A. Hosseini, det. Sandor Csosz.

Distribution. Holotype gyne and paratype workers as well as gynes and males of *Tetramorium feroxoide* were recorded from Turkmenistan (Csosz & Schulz 2010). This is a new record for Iran.

Remarks. It is notable that *Tetramorium feroxoide* belongs to the *T. ferox* species-complex. Within the *Tetramorium ferox*-species complex, external morphological characters of *T. feroxoide* gynes include very smooth surface of mesosoma, sparse pubescence and smooth and shiny first gastral tergite, making the species unique (Csosz & Schulz 2010). However, *T. feroxoide* workers can be confused with the smallest *T. ferox* workers. The general appearance of the head and mesosoma of *T. ferox* workers is always rugulose, microreticulate and dull, but workers of *T. feroxoide* usually bear feebler (and often parallel) rugulae on head and mesosoma than *T. ferox* workers (Csosz & Schulz 2010). In *T. feroxoide* gynes found in Iran, the whole body and appendages are brown to light brown in color, whereas in the reported specimen from Turkmenistan, these

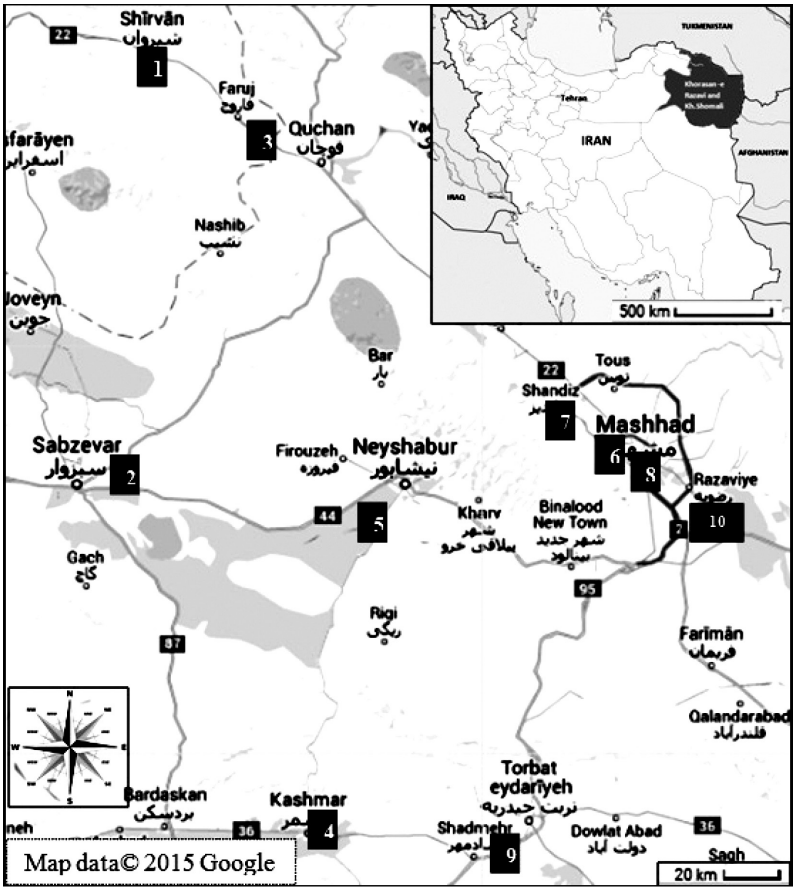


Fig. 1. Map of investigated regions. Dark numbered rectangles indicate locations where species collection took place (1- *Tetramorium sulcinode*; 2- *Tetramorium feroxoide*; 3- *Tetramorium striativentre*; 4- *Tetramorium* sp. IR-Kashmar-01(*chefketi*-complex); 5- *Tetramorium* sp. IR-Neyshabur-01 (*caespitum*-complex); 6- *Monomorium areniphilum*; 7- *Messor denticulatus*; 8- *Tapinoma erraticum*; 9- *Componotus xerxes;* 10- *Lepisiota frauenfeldi*). The small inset in the right side of map, shows outline of Iran.

are dark brown or black (Csosz & Schulz 2010). The difference in color between Iran's species and those from Turkmenistan' is probably due to geographical variation.

***Tetramorium striativentre* Mayr, 1877** (Figs 8-10)

Tetramorium caespitum var. *striativentre* Mayr, 1877 [original description].

Tetramorium caespitum striativentre: Emery, 1891 [subspecies of *T. caespitum*].

Tetramorium striativentre: Dalla Torre, 1893 [raise to species].

Material examined. 9 workers, steppe land, Faruj city (37.4000 96 °N, 57.937088 °E), Khorasan-e-Shomali province, 1093 m a.s.l., 30.iii.2005, leg. A. Hosseini, det. Sandor Csosz.

Distribution. For Iran, *Tetramorium striativentre* is recorded from Khojir National Park in Tehran province (Paknia 2008) and Aranva Bidgol and Maranjab in Isfahan province (Nasiri 2011). Outside of Iran, the distribution range of this species is Turkestan (i.e. Kazakhstan) (Collingwood 1961).This species is also reported from Afghanistan (Collingwood 1961).

Remarks. The following characters distinguish *Tetramoriums triativentre* from the other *Tetramorium* species in Iran: head, postpetiole and gaster dark brown to black in color; thorax, peti-

ole and appendages brown; body surface with light sparse setae. Petiole more protruding than postpetiole. Propodeum with relatively long brown spines.

***Tetramorium* sp. IR-Kashmar-01 (*chefketi* -complex)**

Material examined. 3 workers, arid land, Kashmar city (35.220661°N, 58.460999 °E), Khorasan-e-Razavi province, 1052 m a.s.l., 9.v.2005, leg. A. Hosseini, det. Sandor Csosz.

Remarks. According to Dr. Csosz's determination (2014), this species belongs to the *Tetramorium chefketi*-complex and probably is new to science and needs to be further investigated in the future.

***Tetramorium* sp. IR-Neyshabur-01 (*caespitum*-complex)** (Figs11-13)

Material examined. 16 workers, steppe land, Neyshabur city (36.210762 °N, 58.801575 °E), Khorasan-e-Razavi province, 1197 m a.s.l., 25.v.2003, leg. A. Hosseini, det. Sandor Csosz.

Remark. According to Dr. Csosz's determination (2014), this species is new to science and needs to be further investigated in the future.

Genus *Monomorium* Mayr, 1855
***Monomorium areniphilum* Santschi, 1911 (Figs 14-16)**

Monomorium salomonis var. *areniphila* Santschi, 1911 [original description].

Monomorium salomonis areniphilum: Santschi, 1936 [subspecies of *M. salomonis*].

Monomorium areniphilum: Collingwood, 1985 [raise to species].

Material examined. 22 workers, town's green areas, Mashhad city (36.304526 °N, 59.528292 °E), Khorasan-e-Razavi province, 1036 m a.s.l., 10.iv.2013, leg. A. Hosseini, det. Kadri Kıran.

Distribution. Outside of Iran, this species has been reported from North Africa, Saudi Arabia, Tunisia, Egypt, Kuwait and Lebanon (Emery 1915; Collingwood 1985). For Iran, it has previously been reported anonymously (www.antweb.org).

Remarks. It is notable that *Monomorium areniphilum* is like *M. salomonis* (L.), but the former is more shining with a much deeper metanotal groove and more rounded propodeum which clearly differentiate it as a separate species not a subspecies of *M. salomonis* (Collingwood 1985). The following characters distinguish *M. Areniphilum* from the other *Monomorium* species in Iran: head, petiolar node and appendages brown, mesosoma light brown, gaster black in color. Compound eyes white. Distance between two antennae very short. Anterior margin of clypeus with one pair of great and erect hairs. Petiole relatively higher than postpetiole. Surface of gaster with scarce long hairs.

Genus *Messor* Forel, 1890
***Messor denticulatus* Santschi, 1927** (Figs 17-19)

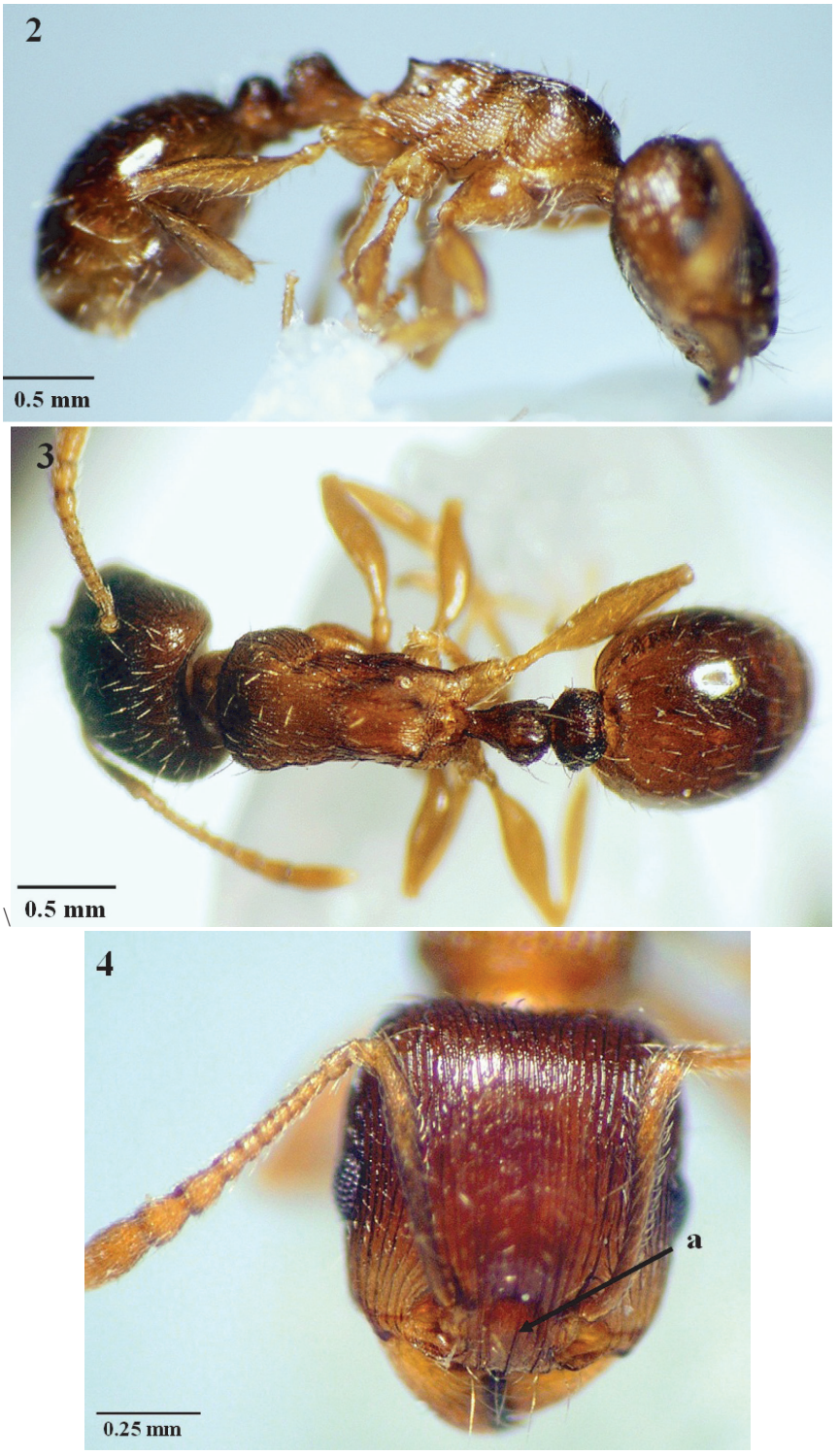
Messor minor st. *denticulatus* Santschi, 1927 [original description].

Messor denticulatus: Tarbinsky, 1976 [raise to species].

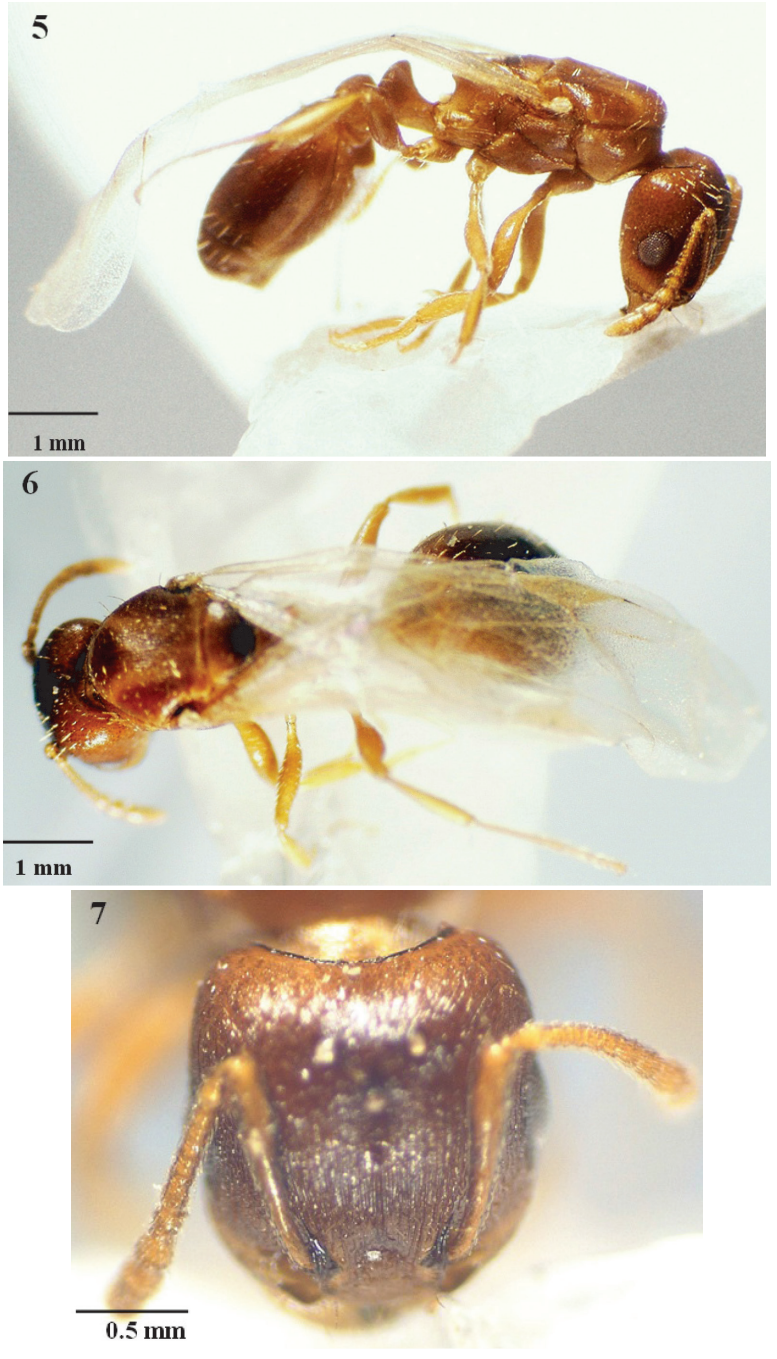
Material examined. 11 workers, forest Mountains, Shandiz town (36. 304785 °N, 59.528314 °E), Khorasan-e-Razavi province, 1036 m a.s.l., 29.iv.2013, leg. A. Hosseini, det. Kadri Kıran.

Distribution. Outside of Iran, this species is widely distributed in central Asia and also has been recorded from Turkey and Israel (Borowiec & Salata 2012). However *Messor denticulatus* had before been reported by Arnol'di (1977) from the northeastern Iran, name of location was not reported in that record.

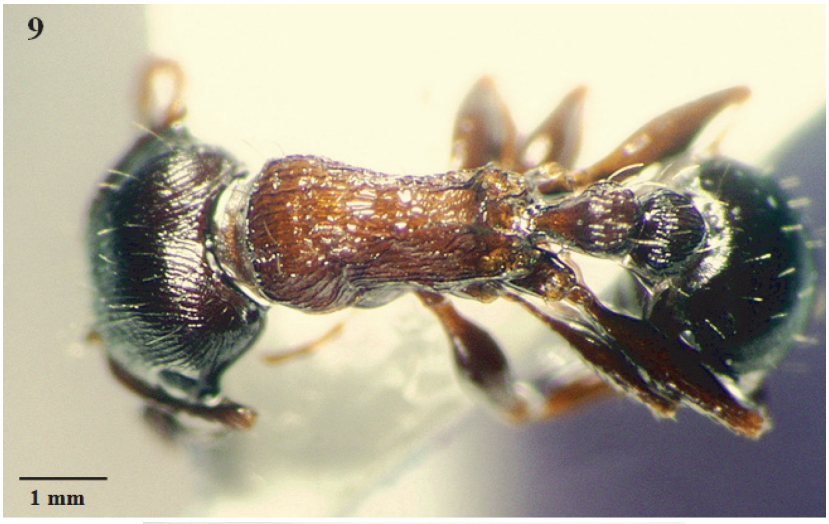
Remarks. The following characters distinguish *Messor denticulatus* from the other *Messor* species in Iran: head, antennae and gaster dark brown; head minutely foevolate. Mesosoma and legs relatively lighter than gaster in color; mesosoma dorsum transversely rugose. Sparse and light hairs on upper surface of gastral tergite. Dorsum of waist with the long and erect setae; hairs on head scarcely.

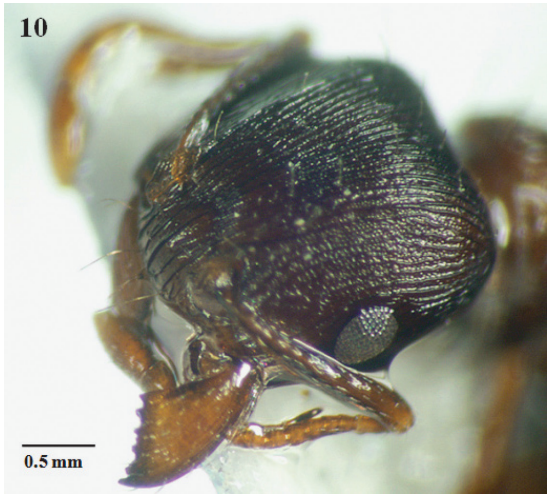


Figs 2 – 4. *Tetramorium sulcinode*. 2, Mesosoma in profile view; 3, Body in dorsal view; 4, Head in frontal view. a) Median portion of clypeus more outstanding in comparison with the other *Tetramorium* species.



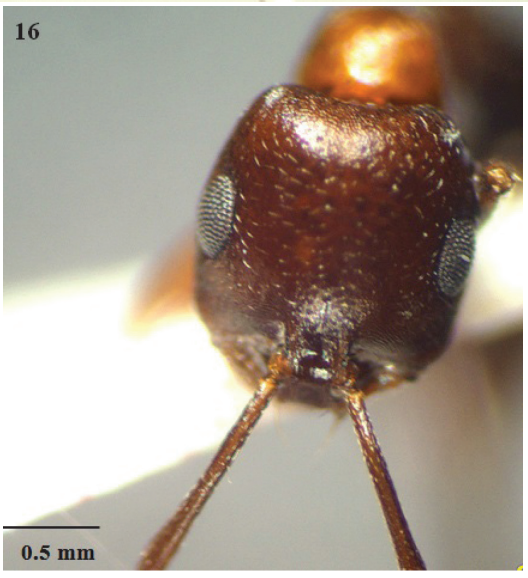
Figs 5 – 7. *Tetramorium feroxoide*. 5, Mesosoma in profile view; 6, Body in dorsal view;7, Head in frontal view.



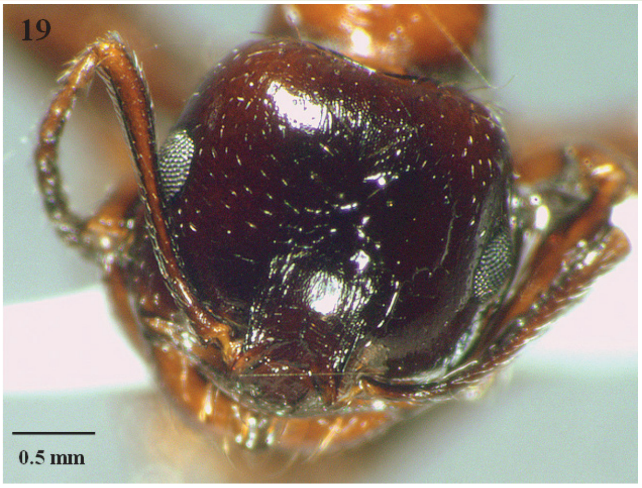


Figs 8 – 10. *Tetramorium striativentre*. 8, Mesosoma in profile view; 9, Body in dorsal view;10, Head in frontal view. a) Propodeum with relatively long brown spines.

Figs 11 – 13. *Tetramorium* sp. IR-Neyshabur-01 (*caespitum*-complex).11, Mesosoma in profile view; 12, Body in dorsal view; 13, Head in frontal view.



Figs 14 – 16. *Monomorium areniphilum*.14, Mesosoma in profile view; 15, Body in dorsal view; 16, Head in frontal view.



Figs 17 – 19. *Messor denticulatus*is. 17, Mesosoma in profile view; 18, Body in dorsal view; 19, Head in frontal view.

Figs 20 – 22. *Componotus xerxes*. 20, Mesosoma in profile view; 21, Body in dorsal view; 22, Head in frontal view.

Subfamily Dolichoderinae Forel, 1878
Genus *Tapinoma* Foerster, 1850
***Tapinoma erraticum* (Latreille, 1798)**

Formica erratica Latreille, 1798 [original description].

Tapinoma erraticum: Mayr, 1853 [combination in *Tapinoma*].

Material examined. 32 workers, agricultural land, Mashhad city (36.304785 °N, 59.528314 °E), Khorasan-e-Razavi province, 1036 m a.s.l., 20.v.2013, leg. A. Hosseini, det. Kadri Kıran.

Distribution. This species is an inhabitant of dry heath (Collingwood 1958). Outside of Iran, *Tapinoma erraticum* is found throughout central Europe from Spain to the Caucasus and from mountains of the south Italy to the north Germany (Collingwood 1979). For Iran, Crawley (1920 a) reported this species from the north (Caspian region) and the south of Iran, but he did not clarify in which city it was collected.

Remarks. The following characters distinguish *Tapinoma erraticum* from the other *Tapinoma* species in Iran: body surface with light condensed pubescence; head trapezoid in full-face view; workers without ocelli; upper margin of clypeus with a concavity. Anterior margin of last gasteral segment with 6 setae**.**

Among species of the present study, *Tapinoma erraticum* is widely spread in the surveyed regions and colonies are abundant. Furthermore, this species has a strong beneficial reciprocal relationship with several damaging honeydew-producing hemipterans on important crops (such as *Gossipium hirsutum* L. and *Cucumis sativus* L.) (unpublished data, Hosseini *et al*., 2015).

Sufamily Formicinae Latreille, 1809
Genus *Componotus* Mayr, 1861
***Componotus xerxes* Forel, 1904** (Figs 20-22)

Camponotus maculates r. *xerxes* Forel, 1904a [original description].

Componotus xerxes: Pisarski, 1967 [raise to species].

Material examined. 8 workers, arid land, Torbat-e-Heydariye city (35.261319 °N, 59.253387 °E), Khorasan-e-Razavi province, 1408 m a.s.l., 2.iv.2013, leg. A. Hosseini, det. Celal Karaman.

Distribution. This species ranges from Central Asia to the Middle East (Collingwood *et al*. 2011) and is reported from Middle Eastern countries: Saudi Arabia, United Arab Emirates (UAE), Oman (Collingwood 1985; Collingwood & Agosti 1996), Kuwait (Collingwood *et al*. 2011), Egypt (Vonshak & Ionescu-Hirsch 2009) and Turkey (Karaman & Aktac 2013). For Iran, *Componotus xerxes* is recorded from Boushehr, Shiraz (Vonshak & Ionescu-Hirsch 2009) and Sabzevar city as well as Khorasan-e-Razavi province (Radchenko 1997).

Remarks. *Camponotus xerxes* is closely related to *C. fellah* Tohme, but it can be distinguished by the absence of erect setae on the ventral head surface, whereas in *C. fellah* there are 1-10 setae (Collingwood & Agosti 1996). Foragers are often seen from March to October with the greatest abundance in September (Sharaf *et al.* 2013).

Genus *Lepisiota* Santschi, 1926
***Lepisiota frauenfeldi* (Mayr, 1855)**

Hypoclinea frauenfeldi Mayr, 1855 [original description].

Acantholepis frauenfeldi: Mayr, 1861 [combination in *Acantholepis*].

Lepisiota frauenfeldi: Baroni Urbani, Bolton & Ward, 1992 [combination in *Lepisiota*].

Material examined. 17 workers, town's green areas, Mashhad city (36.304785 °N, 59.528314°E), Khorasan-e- Razavi province, 1036 m a.s.l., 29.iv.2013., leg. A. Hosseini, det. Kadri Kıran.

Distribution. Outside of Iran, *Lepisiota fraunfeldi* is found in Central Asia, Mediterranean regions and North Africa (Collingwood 1961). In Iran, the species is reported from Aghchepire city in Zanjan province (Hossein Nezhad 2008).

Remarks. The following characters distinguish *Lepisiota fraunfeldi* from the other *Lepisiota* spe-

cies in Iran: four pairs of standing hairs on dorsal - anterior portion of head. Anterior margin of clypeus with two- pair white and erected hairs.

DISCUSSION

In our study, two species (*Tetramorium feroxoide*, *T. sulcinode*) are newly recorded for the ant fauna of Iran and four species including *Tetramorium striativentre* Myer, 1877, *Monomorium areniphilum* Sanntschi, 1911, *Tapinoma erraticum* Latrille, 1798, and *Lepisiota fraunfeldi*, Mayr 1855 are new records for Khorasan-e-Razavi and Khorasan-e-Shomali provinces. By including the present records, the total number of ant species from Iran and the northeastern provinces has increased to 183 and 20, respectively. We suggest that a comprehensive and systematic survey of family Formicidae fauna not limited to Khorasan-e-Razavi and Khorasan-e-Shomali provinces, but in the whole Iran, needs to be carried out in the future using standardized collecting methods (such as a pitfall trap, Berlese, bark Spray).

ACKNOWLEDGMENTS

The researchers would like to specially thank Dr. Csosz (Ecology Research Group, Eötvös Loránd University, Hungarian Natural History Museum, Budapest, Hungary) and Dr. Kıran (Trakya University, Turkey) for confirming the species. This research was supported by Ferdowsi University of Mashhad, which is gratefully acknowledged.

REFERENCES

Alipanah H, Kharazi Pakdel A and Moghadassi M, 1995. Taxoomic study of Myrmicinae ants in Tehran. In: *Proceedings of the 12th Iranian Plant Protection Congress*, Karadj p.304.

Ardeh M, 1994. Study on systematic and behavioral specially of ants of Karaj region. Tehran University, Tehran, 108 pp (in persian).

Arnol'di KV, 1977. Review of the harvester ants of the genus *Messor* (Hymenoptera, Formicidae) in the fauna of the USSR. *Zoologicheskii Zhurnal* 56: 1637-1648.

Baroni Urbani C, Bolton B and Ward PS, 1992. The internal phylogeny of ants (Hymenoptera: Formiciade). *Systematic Entomology* 17: 301-329.

Bolton B, 1994. *A new general catalogue of the ants of the world*. Harvard University Press, Cambridge, MA, 504 pp.

Bolton, B., 2014. *An online catalog of the ants of the world* (online available: www. antweb.org).

Borowiec L and Salata S, 2012. Ants of Greece – additions and corrections (Hymenoptera: Formicidae). *Genus (Wrocław)* 24: 335-401.

Collingwood CA, 1961. The 3rd Danish Expedition to Central Asia. Zoological Results 27. Formicidae (Insecta) from Afghanistan. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening* 123: 51-79.

Collingwood CA, 1979. The Formicidae of Fesnnoscandia and Denmark. *Fauna Entomologica Scandinavica* 8: 1-174.

Collingwood CA, 1985. Hymenoptera: Family Formicidae of Saudi Arabia. *Fauna of Saudi Arabia* 7: 230-302.

Collingwood CA and Agosti D, 1996. Formicidae of Saudi Arabia (Part 2). *Fauna of Saudi Arabia* 15: 300-385.

Collingwood CA, Agosti D, Sharaf MR and Van Harten T, 2011. Order Hymenoptera, Family Formicidae. *Arthropod Fauna of the UAE* 4: 405-474.

Crawley WC, 1920a. Ants from Mesopotamia and north-west Persia. *Entomologists Record and Journal of Variation* 32: 162-166.

Crawley WC, 1920b. Ants from Mesopotamia and north-west Persia (concluded). *Entomologists Record and Journal of Variation* 32: 177-179.

Csosz S, Radchenko A and Schulz A, 2007. Taxonomic revision of the Palaearctic *Tetramorium chefketi* species complex (Hymenoptera: Formicidae). *Zootaxa* 1405: 1-38.

Csosz S and Schulz A, 2010. A taxonomic review of the Palaearctic *Tetramorium ferox* species-complex (Hymenoptera, Formicidae). *Zootaxa* 2401:1-29.

Dlussky GM and Zabelin SI, 1985. Ant fauna (Hymenoptera, Formicidae) of the River Sumbar Basin (south-west Kopetdag). [In Russian]. In: *The vegetation and animal world of western Kopetdag*. [In Russian] (Nechaevaya NT, ed), Ylym, Ashkhabad, 208-246.

Dalla Torre KW, 1893. *Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. Formicidae (Heterogyna)*. W. Engelmann, Leipzig, 289 pp.

Emery C, 1891. *Exploration scientifique de la Tunisie. Zoologie. Hyménoptères. Révision critique des fourmis de la Tunisie*. Imprimerie Nationale, Paris, iii + 21 pp.

Emery C, 1915. Su due formiche della Tripolitania. *Bollettino del Laboratorio di Zoologia Generale e Agraria della Reale Scuola Superiore d'Agricoltura*. 9: 378 p.

Firouzi F, Pashaei Rad S, Hossein Nezhad S and Agosti D, 2011. Four new records of ants from Iran (Hymenoptera: Formicidae). *Zoology in the Middle East* 52: 71-78.

Foerster A, 1850. Hymenopterologische Studien. 1. Formicariae. Aachen, Ernst Ter Meer, 74 pp.

Forel A, 1878. Études myrmécologiques en 1878 (première partie) avec l'anatomie du gésier des fourmis. *Bulletin de la Société Vaudoise des Sciences Naturelles* 15: 337-392.

Forel A, 1890. Fourmis de Tunisie et de l'Algérie orientale. *Annales de la Société Entomologique de Belgique* 34: 61-76.

Forel A, 1904a. Dimorphisme du mâle chez les fourmis et quelques autres notices myrmécologiques. *Annales de la Sociét Entomologique de Belgique* 48: 421-425.

Forel A, 1904b. Fourmis de British Columbia récoltées par M. Ed. Whymper. *Annales de la Société Entomologique de Belgique* 48: 152-155.

Hossein Nezhad S, 2008. Specimen: CSH000030 *Lepisiota frauenfeldi*, 31 dec 2010 edn. CASC, San Francisco, CA, USA.

Hossein Nezhad S, Pashaei Rad S, Firouzi F and Agosti D, 2012. New and additional records for the ant fauna from Iran. *Zoology in the Middle East* 55: 65-74.

Karaman C and Aktac N, 2013. Descriptions of four new species of *Camponotus* Mayr (Hymenoptera: Formicidae), with a key for the worker caste of the *Camponotus* of Turkey. *BioOne* 86: 36-56.

Khandehroo F, Moravvej G, Namghi HS and Fekrat L, 2015. New records of ant species (Hymenoptera: Formicidae) to the fauna of Iran: *Camponotus alii* Forel, 1890 and *Proformica korbi* (Emery, 1909). *Asian Myrmecology* 7: 129 – 131.

Kiran K and Karaman C, 2012. First annotated checklist of the ant fauna of Turkey (Hymenoptera: Formicidae). *Zootaxa* 3548: 1-38.

Kiran K, Alipanah H and Paknia O, 2013. A new species of the ant genus *Aphaenogaster* Mayr (Hymenoptera: Formicidae) from Iran. *Asian Myrmecology* 5: 45-51.

Latreille PA, 1798. *Essai sur l'histoire des fourmis de la France*. F. Bourdeaux, Brive, 50 pp.

Latreille PA, 1809. *Genera crustaceorum et insectorum secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimus explicata*. Tomus 4. Parisiis et Argentorati, Koenig, 399 pp.

Lepeletier de Saint-Fargeau A, 1835. *Histoire naturelle des insectes*. Hyménoptères. Roret, Tome I. Paris, 547 pp.

Linnaeus C, 1758. Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata., Holmiae: L. Salvii, 824 pp.

Mayr G, 1853. Beitrage zur Kenntniss der Ameisen. *Verhandlungen der Zoologisch-Botanischen Vereins in Wien* 3: 101-114.

Mayr G, 1855. Formicina austriaca. Beschreibung der bisher im österreichischen Kaiserstaate aufgefundenen Ameisen, nebst Hinzufügung jener in Deutschland, in der Schweiz und in Italien vorkommenden Arten. *Verhandlungen der Zoologisch-Botanischen Vereins in Wien* 5: 273-478.

Mayr G, 1861. *Die europäischen Formiciden. Nach der analytischen Methode bearbeitet.* Wien. C. Gerolds Sohn, 80 pp.

Mayr G, 1877. Formicidae. [In Russian.]. *Izvestiya Imperatorskago Obshchestva Lyubitelei Estestvoznaniya Antropologii i Etnografii pri Imperatorskom Moskovskom Universitete* 26: 1-20.

Menozzi C, 1927. Zur Kenntnis des Weibchens von *Dorylus (Anomma) nigricans* var. *molesta* Gerst. (Hymenoptera - Formicidae). *Zoologischer Anzeiger* 70: 263-266.

Nasiri K, 2011. *Tetramorium striativentre* Mayer 1877. CASENT0910227. Downloaded from (www.antweb.org) on 11, March, 2014.

Paknia O, 2006. Distribution of the ponerine ant *Pachcondyla sennaarensis* (Hym.: Formiciade) in Iran. *Myrmecologische Nachrichten* 8: 235-238.

Paknia O, 2008. *Tetramorium striativentre* Mayer 1877.ANTWEB1008086. Downloaded from (www.antweb.org) on 11, March, 2014.

Paknia O and Kami H, 2007. New and additional records for the formicid fauna (Insecta: Hymenoptera) of Iran. *Zoology in the Middle East* 40: 85-90.

Paknia O, Radchenko A, Alipanah H and Pfeiffer M, 2008. A preliminary checklist of the ants (Hymenoptera: Formicidae) of Iran. *Myrmecological News* 11: 151-159.

Pisarski B, 1967. Fourmis (Hymenoptera: Formicidae) d'Afghanistan récoltées par M. Dr. K. Lindberg. *Annales Zoologici (Warsaw)* 24: 375-425.

Pisarski B, 1970. Beiträge zur Kenntnis der Fauna Afghanistans. *Formicidae, Hym. Casopis Moravského Musea v Brne* 54: 305-326.

Radchenko AG, 1994. New species of ants of the genus *Leptothorax* (hymenoptera, Formicidae) from the southern and eastern Palearctic. *Zhurnal Ukrains'koho Entomolohichnoho Tovarystva* 2: 23-34.

Radchenko AG,1996. Key to the ants of the genus *Camponotus* (Hymenoptera, Formicidae) from Asian Palaearctic. *Zoologicheskii Zhurnal* 75: 1195-1203. (in Russian; English translation: Entomological Review (Washington) 76: 430-437).

Radchenko AG, 1997. Review of ants of the subgenus Myrmentoma genus *Camponotus* (Hymenoptera, Formicidae) of the Asian Palearctic. *Zoologicheskii Zhurnal* 76: 703-711.

Santschi F, 1911. Formicides nouveaux de l'Afrique Mineure (4e note suite). *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord* 2: 78-85.

Santschi F, 1926. Trois notes myrmécologiques. *Annales de la Société Entomologique de France* 95: 13-28.

Santschi F, 1927. A propos du *Tetramorium caespitum* L. *Folia Myrmecologica et Termitologica* 1: 52-58.

Santschi F, 1936. Étude sur les fourmis du genre *Monomorium* Mayr. *Bulletin de la Société des Sciences Naturelles du Maroc* 16: 32-64.

Sharaf MR, Abdel-Dayem MS, Al Dhafer HN and Aldawood AS, 2013. The ants (Hymenoptera:formicidae) of Rawdhat Khorim Nature Preserve, Saudi Arabia, with description of a new species of the genus *Tetramorium* Mayr. *Zootaxa* 3709: 565-580.

Shiran E, Mossadegh MS and Esfandiari M, 2013. Mutualistic ants (Hymenoptera: Formicidae) associated with aphids in central and southwestern parts of Iran. *Journal of Crop Protection* 2: 1-12.

Tarbinsky YS, 1976. *The ants of Kirghizia*. Frunze, Ilim, 217 pp.

Vonshak M and Ionescu-Hirsch A, 2009. A checklist of the ants of Israel (Hymenoptera: Formicidae). *Israel Journal of Entomology* 39: 33-55.