

EIGHT ANTS SPECIES (HYMENOPTERA: FORMICIDAE) NEW FOR THE FAUNA OF IRAN

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ABSTRACT: Until recently, the ants' fauna of Iran has been rather poorly known. In this study, we recorded eight ants' species new to Iran, during 2008-2010. The species are as follow: *Aphaenogaster splendida* Roger, 1859; *Cardiocondyla emeryi* Forel, 1881; *Monomorium acutinode* Collingwood & Agosti, 1996; *Pheidole sculpturata* Mayr, 1866; *Camponotus lateralis* Olivier, 1792; *Lepisiota melas* Emery, 1915; *Lepisiota niger* Dalla Torre, 1893 and *Plagiolepis schmitzii* Forel, 1895. All species had symbiotic relationship with *Nipaecoccus viridis* (Newstead).

KEY WORDS: Formicidae, ant, fauna, Fars, Iran.

Among all the wide variety of insect life on the planet, ants are one of the few forms universally recognized. This is because as a group they are truly ubiquitous, and usually quite conspicuous (Bolton, 1994). They thrive in most ecosystems, and may form 15-25% of the terrestrial animal biomass (Schultz, 2000). Their Social organization and behaviors, ability to change different habitats and exploit the useful resources lead them to have success and survive in diverse environments. Ants are classified in a single family named Formicidae with about 288 extant ant genera currently recognized and with more than 12,000 described species (Ward, 2007).

Iran is located in the Middle East and occupies 1,648,195 km². From a biogeographical viewpoint, the Iranian fauna and flora are much more diverse than those of its neighbours due largely to its geographic positioning between two distinct biogeographic realms, the Palaearctic and the Oriental. The Iranian ant fauna has been poorly investigated and many areas were sampled only sporadically. Paknia et al. (2008) listed 110 ants' species from Iran and discussed their distribution in detail. Recently the ant fauna of Iran has been studied by Iranian Entomologist: Mossadegh et al. (2008), Ghahari et al. (2009), Rafinejad et al. (2009), Paknia et al. (2010), Radchenko & Paknia (2010) and Firouzi et al. (2011). So far, 148 species belonging to 32 genera have been recorded from Iran. Among them, 16 species have been collected from Fars province (Seifert, 2003; Tirgari & Paknia, 2004). This province has an area of about 133299 km² and covers 8.1 percent of Iran. It is located between 27° 3' to 31° 42' northern latitude and 50° 30' to 55° 36' eastern longitude. The climate of the province is arid to semiarid. This study mainly was conducted in central parts of the province, with relatively rainy mild winters and hot dry summer.

Here, is a report of 8 new species for the fauna of Iran. All species were collected in a study on symbiotic ants with *N. viridis* which is one of the most important pests of citrus orchards in Fars province.

MATERIALS AND METHODS

A study was worked out on symbiotic ants in citrus orchards of Fars province, South Iran. From November 2008 to November 2010, the fruits, leaves, buds, stem and foliage of citrus trees were visited and the ants species which were feeding on honeydew of *N. viridis* were collected by hand, forceps and soft brush. The specimens were preserved in 75% alcohol in small glass vials and were transferred to the laboratory. The morphological keys such as Collingwood & Agosti (1996) and Agosti & Collingwood (1987) were used for identification. Voucher specimens of all ants' species were deposited in Insect and Mite Collection of Ahvaz (IMCA), Plant Protection Department, Shahid Chamran University of Ahvaz, Iran.

Measurements (in millimeters) were taken with a stereomicroscope fitted with an ocular micrometer. Standard measurements are:

TL (Total Length): total outstretched length of a specimen, from mandibular apex to gastral apex.

HL (Head Length): length of head, in full-face view, excluding mandibles, measured in a straight midline.

HW (Head Width): maximum width of head, excluding eyes, measured in full-face view.

EL (Eye Length): maximum diameter of the eye.

SL (Scape Length): straight-line length of antennal scape excluding condylar bulb.

SI: (Scape Index): $SL \times 100$ divided by HW.

PW (Petiole Width): maximum width of petiole in dorsal view.

PL (Petiole Length): maximum length of petiole in profile view.

PPW (Postpetiole Width): maximum width of postpetiole in dorsal view.

PPL (Postpetiole Length): maximum length of postpetiole in profile view.

Symbol used in this paper: ♀ worker.

RESULTS

Including the present records, the current total number of recorded ant species in Iran is 157. All the species we deal with here were collected from Fars province, South Iran. It has been pointed out that all species have a symbiotic relationship with *N. viridis*.

Subfamily Myrmicinae Lepeletier de Saint-Fargeau, 1835

Genus *Aphaenogaster* Mayr, 1855

Aphaenogaster splendida, Roger, 1859

Measurements: TL: 5.2, HL: 1.46, HW: 1.08, SL: 1.68, SI: 155.55, PW: 0.28, PPW: 0.36.

Identification: Head is longer than broad. Occipital margins are oval. Head is only with a few longitudinal striae from mandibles not reaching the occiput. Anterior margin of clypeus has wide and shallow notch. All funiculus segments are at least twice as long as broad. Mesonotum is not raised above the pronotum. Metanotal groove is quite distinct. Propodeum is armed with two acute spines. Nodes are smooth. Mesosoma is sculptured. Gaster, except basal area of first segment which is sculptured, is smooth. Whole body is reddish yellow.

Materials: 2 ♀: Karadeh (28° 59' N, 53° 08' E), 1434 m, 28.8.2009.

Distribution: Spain (Collingwood, 1978), Greece, former Yugoslavia (Agosti & Collingwood, 1987), Malt Island (Schembri & Collingwood, 1981) and Israel (Vonshak & Ionescu, 2009).

Genus *Cardiocondyla* Emery, 1869

***Cardiocondyla emeryi* Forel, 1881**

Measurements: TL: 2.4-2.8, HL: 0.48-0.52, HW: 0.43-0.48, SL: 0.38-0.43, PW: 0.14-0.16, PPW: 0.24-0.28, PPL: 0.14-0.16.

Identification: It has a small size. Head's length is slightly more than its width (HL/HW: 1.1-1.11). Scape is short, clearly not reaching occiput (SI: 84.21-94.44). Propodeal spines are distinct and acute. The propodeal dorsum is convex behind the groove. Petiole represents a flattened dorsum in profile view and it is longer than its width in dorsal view. Petiolar peduncle is approximately long. Postpetiole appears wider than length in dorsal view. The body has different colors: whole body except black gaster is yellowish or dark brown.

Materials: 4 ♀, Shiraz (29° 37' N, 52° 32' E) 1540 m, 07.10.2009.

Distribution: Angola, Cameroon, Egypt, Israel, Madagascar, Morocco, Nepal, Nigeria, Polynesia, Rwanda, South Africa, Spain, Sri Lanka, Sudan, Uganda, Tanzania, Yemen and Zimbabwe (Seifert, 2003).

Genus *Monomorium* Mayr, 1855

***Monomorium acutinode* Collingwood & Agosti, 1996**

Measurements: TL: 3.04, HL: 0.84, HW: 0.67, SL: 0.72, EL: 0.22, SI: 107.46.

Identification: Head is elongated in a rectangular shape. Apical segment of funiculus is slightly shorter than the preceding 2 segments combined. Petiole shows a high triangle in side view (0.27 mm) and narrow in dorsal view (0.2 mm). Occiput is without projecting hairs. There are no erect hairs on dorsum of alitrunk. Petiole has one pair and the postpetiole has two pairs of hairs. Color of whole body is brown.

Materials: 1 ♀, Jahrom (28° 30' N, 53° 33' E), 1043 m, 08.9.2009.

Distribution: Oman (Collingwood & Agosti, 1996).

Genus *Pheidole* Westwood, 1839

***Pheidole sculpturata* Mayr, 1866**

Measurements: TL: 2.64, HL: 0.6, HW: 0.58, SL: 0.72.

Identification: Length of head is as long as its width with rounded corners. The scape extends back beyond the occipital margin. Propodeal spine is sharp and short. A few long hairs occur on the alitrunk and shorter on the head. Promesonotum is strongly convex and the mesonotum is distinctly impressed transversely. Metanotal groove is deep. Alitrunk is without promesonotal suture, slightly shiny, finely reticulate and irregular rugous. Color of entire body is reddish brown except appendages which are lighter.

Materials: 1 ♀, Shiraz (29° 37' N, 52° 32' E), 1540 m, 29.7.2009.

Distribution: Oman, Yemen and Tropical Africa (Collingwood & Agosti, 1996).

Subfamily Formicinae Latreille, 1809

Genus *Camponotus* Mayr, 1861

***Camponotus lateralis* Olivier, 1792**

Measurements: TL: 4.38, HL: 1.01, HW: 0.92, SL: 1.03.

Identification: Head is as long as width, lateral sides and occipital margin are slightly convex. The scapes are surpassing the occipital margin. middle area of alitrunk has sparse pale hairs. Propodeum has a transverse row of erect hairs. Petiole has 8 standing hairs. Mesopropodeal has a deep furrow. It has a propodeum dorsum with posterior half concave longitudinally. *C. lateralis* and *C. staryi* Pisarski are similar, except for the propodeal dorsum being lower than the highest point of the mesonotum in *C. lateralis*, as opposed to a propodeal dorsum exceeding the highest point of the mesonotum in *C. staryi* (Ionescu, 2009). Whole body is moderately shiny. Head and alitrunk are reddish brown and the gaster is black.

Materials: 1 ♀, Karadeh (28° 59' N, 53° 08' E), 1434 m, 02.8.2009.

Distribution: Israel, Spain, Italy, Greece, Cyprus, Syria, Crimea, Caucasus, Morocco and Eastern Mediterranean (Ionescu, 2009).

Genus *Lepisiota* Santschi, 1921

***Lepisiota melas* Emery, 1915**

Measurements: TL: 3.31-3.64, HL: 0.67-0.72, HW: 0.57-0.72, SL: 0.98-1.1.

Identification: Head is a little longer than width; it has a rounded rectangle. Scape is long (SI: 154-179). Whole body is covered by thin pale hairs. Propodeal spines are short and not unturned. Petiol owns spine like teeth. Whole body is moderately shiny. Except a small area of the mesonotum that is reddish and the antennae, mandibles, tibia and tarsi which are orange-brown, the entire body is black.

Materials: 4 ♀, Shiraz (29° 37' N, 52° 32' E), 1540 m, 6.7.2009; 14 ♀, Jahrom (28° 30' N, 53° 33' E), 1043 m, 2.5.2010; 14 ♀ Fasa (28° 56' N, 53° 38' E), 1378 m, 15.7.2009, 7 ♀ Jannat Shahr (28° 39' N, 54° 41' E), 1156 m, 3.5.2009.

Distribution: Greece and former Yugoslavia (Agosti & Collingwood, 1987).

Lepisiota niger Dalla Torre, 1893

Measurements: TL: 3.19. HL: 0.74, HW: 0.65, SL: 1.03.

Identification: Head is longer than width. Scape is long (SI: 159). Entire body is covered by pail hairs which are less than in *L. melas*. Propodeal spines are short and straight. Petiole dorsum is narrow and rounded without teeth. Body is dark except antennae, tarsi and mandibles which are orange-brown. Entire body is shiny.

Materials: 1 ♀, Fasa (28° 56' N, 53° 38' E), 1378 m, 15.7.2009.

Distribution: South East Europe, Oman and U.A.E (Collingwood & Agosti, 1996), Italy and Egypt (Mohamed et al., 2001).

Genus *Plagiolepis* Mayr, 1861

Plagiolepis schmitzii Forel, 1895

Synonym: *Plagiolepis barbara* Santschi, 1951

Measurements: TL: 1.9-2.2. HL: 0.43-0.51, HW: 0.4-0.46, SL: 0.36-0.43.

Identification: Head is as long as width, antennal scape is fairly long (SI: 88-111). Dorsal outline of alitrunk is interrupted by raised metanotum. First funiculus segment is as long as combined second to forth. Third funiculus segment is longer than second. Third and fourth funiculus segments are subequal longer than broad (Collingwood, 1985). There is a row of hair at the end of each segment of gaster. Body color is dark brown and the appendages are clearly paler than rest of the body.

Materials: 20 ♀, Shiraz (29° 37' N, 52° 32' E), 1540 m, 8.9.2009.

Distribution: South West Europe, North Africa and Saudi Arabia (Collingwood & Agosti, 1996).

DISCUSSION

Considering the variety of climate and different ecological conditions which led to heterogeneity of flora and fauna in Iran, descriptions of additional new ant taxa are still to be expected. Nevertheless, faunistic investigations of Iranian ants are scarce. 148 species been recorded so far which in comparison with Iran's adjacent countries such as Arabian Peninsula (300 species in 2.1 million km² area), Turkmenistan (100 species in 488 km² area) or Armenia (70 species in a 30 000 Km²) is so incomplete. In addition to my result and any other possible investigations, much more efforts should be made to identify more information about the distribution of the Iranian myrmecofauna. In order to reach this appoint, complementary techniques of sampling should be applied.

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