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First Record of *Larra transcaspica* (Hymenoptera: Crabronidae) from Turkey

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Abstract

In this study, *Larra transcaspica* F. Morawitz, 1894 (Hymenoptera: Crabronidae) is recorded for the first time from Turkey. With the previously known species, *Larra anathema* (Rossi, 1790), the number of species belonging to the *Larra* genus has increased to two in the country. Important morphological characters of *L. transcaspica* are photographed and the two species are compared in terms of genital structures for the first time.

Keywords: Hymenoptera, Crabronidae, new record, *Larra transcaspica*, Turkey

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Larra transcaspica (Hymenoptera: Crabronidae)'nın Türkiye'den ilk kaydı

Özet

Bu çalışmada, *Larra transcaspica* F. Morawitz, 1894 (Hymenoptera: Crabronidae) Türkiye'den ilk kez kaydedilmiştir. Ülkede daha önceden bilinen *Larra anathema* (Rossi, 1790) ile *Larra* cinsine ait türlerin sayısı ikiye çıkmıştır. *L. transcaspica* örneklerinin önemli morfolojik karakterleri fotoğraflanmış, iki tür genital yapılar açısından ilk kez karşılaştırılmıştır.

Anahtar kelimeler: Hymenoptera, Crabronidae, yeni kayıt, *Larra transcaspica*, Türkiye

1. Introduction

Solitary wasp genus *Larra* Fabricius, 1793 belongs to the family Crabronidae of Hymenoptera. Most members of this family are predatory insects that prey on other insects and spiders, with the exception of the genus *Larra* living as parasitoids. Species belonging to this genus temporarily paralyze their hosts, mole crickets (Orthoptera: Gryllotalpidae) and lay eggs on it. Although the mole cricket recovers from its temporary paralysis and continues its normal activities, feeding of the wasp larvae on cricket's haemolymph eventually causes its death [1]. Due to their parasitoid relationships and possibility to be a potential control agent of an agricultural pest, mole cricket, many valuable studies have been conducted on some species of *Larra* to date [1, 2, 3, 4, 5].

The genus *Larra* has currently 65 species and 13 subspecies worldwide. Most of them are distributed through the tropics, but some species also exist in temperate regions. Only five of the 12 Palearctic species are found in the Western Palaearctic Region. The most common species in the Western Palaearctic Region is *Larra anathema* (Rossi, 1790), while others have a narrow distribution such as *L. anathema nudiventris* Costa, 1893 (in Tunisia), *L. betsiela proditor* Kohl, 1891 (in Morocco and Algeria), *L. diversa* (Walker, 1871) (in Egypt), *L. mediterranea* Gistel, 1857 (in Greece) [6].

Up to date, *Larra* genus has been represented only by one species *L. anathema* in Turkey [7, 8]. By this study, the species *L. transcaspica* was recorded for the first time in the country and its male genital structure was compared with that of the similar species *L. anathema*.

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2. Materials and methods

Insect materials were collected from different natural habitats in Turkey between 2001 and 2018 using insect net. Specimens were identified according to identification key established by Schmid-Egger for *Larra* species from Western and Central Palaearctic region [9]. The materials were deposited in the Entomology Research Laboratory of the Biology Department in Tokat Gaziosmanpaşa University, Tokat/Turkey. The male genitalia of *L. transcaspica* and *L. anathema* were dissected and photographed.

3. Results and discussion

Family Crabronidae Latreille, 1802
Subfamily Crabroninae Latreille, 1802
Genus *Larra* Fabricius, 1793

***Larra anathema* (Rossi, 1790) (Figure 1a, 1 b)**

Material examined: Çankırı: 900 m, 28.VI.2001, 1 ♀, 1 ♂, Leg: M. A. Kırpık; **Erzincan:** Refahiye, Çat, 1250 m, 26.VII.2017, 2 ♀♀; 12.VII.2018, 1 ♀, Leg: İ. Can; **Iğdır:** Kağızman, Kötek, 1400 m, 04.IX.2009, 2 ♀♀, Leg: M. A. Kırpık; **Kars:** Road of Kafkas University, 1750 m, 05.IX.2009, 1 ♂, Leg: M. A. Kırpık; **Sivas:** Akıncılar, Şenbağlar, 1110 m, 18.VIII.2015, 2 ♀♀; 13.VII.2017, 1 ♀; 11.VII.2018, 2 ♀♀; Suşehri, Çokrak village, 1040 m, 05.VII.2018, 1 ♀, 1 ♂, Leg: İ. Can.

General Distribution: Algeria, Austria, Azerbaijan, Bahrain, Bulgaria, China, Croatia, Czech Republic, Egypt, France, Germany, Greece, Hungary, Iran, Iraq, Italy, Kazakhstan, Libya, Macedonia, Morocco, Portugal, Romania, Russia, Slovenia, South Africa, Spain, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine [6].

Distribution in Turkey: Adana, Adıyaman, Aksaray, Amasya, Ankara, Antalya, Artvin, Aydın, Balıkesir, Burdur, Bilecik, Bursa, Erzincan, Erzurum, Hatay, Iğdır, Isparta, İstanbul, İzmir, Kahramanmaraş, Kars, Kırşehir, Konya, Malatya, Manisa, Mersin, Niğde, Ordu, Rize, Tokat, Trabzon, Tunceli, Samsun, Yalova [7, 8, 10, 11, 12].

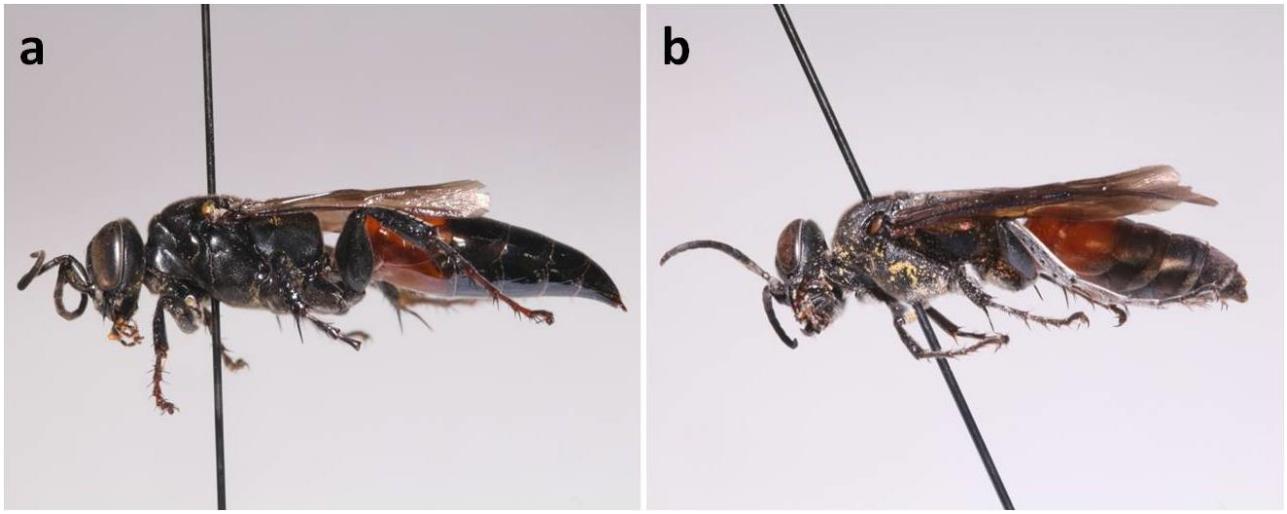

Figure 1. Lateral view of *Larra anathema*, a) female; b) male

***Larra transcaspica* F. Morawitz, 1894 (Figure 2)**

Material examined: Çankırı: 900 m, 15.VIII.2001, 1 ♂, Leg: M. A. Kırpık; **Tokat:** 650 m, 10.VII.2011, 1 ♂, Leg: F. T. Çubuk.

General Distribution: Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, United Arab Emirates [6].

Remark: This species is newly recorded from Turkey.

Figure 2. Lateral view of *Larra transcaspica*, male

Morphological diagnosis and comparison with *Larra anathema* (Rossi, 1790)

Morphologically, *L. transcaspica* is very similar to *L. anathema* but its last sternite is rounded apically (deeply notched in *L. anathema*) (Figure 3c, 3f) and the punctuation on the frons and mesopleuron is sparse (close and dense in *L. anathema*) (Figure 4a, 4b). There are slight differences in the structure of the male genitalia of both species. In fact the gonostyle of *L. transcaspica* is wider medially, deeply indented at the base of the inner edge (Figure 3a, 3d) and more pointed at the apex (Figure 3b, 3e). The apex of the penis valve is slightly curved, and the curved part is elongated in *L. transcaspica* (Figure 3b, 3e). In contrast to the volsella of *L. anathema* short not reaching the curved area on the apex of the penis valve (Figure 3a, 3d).

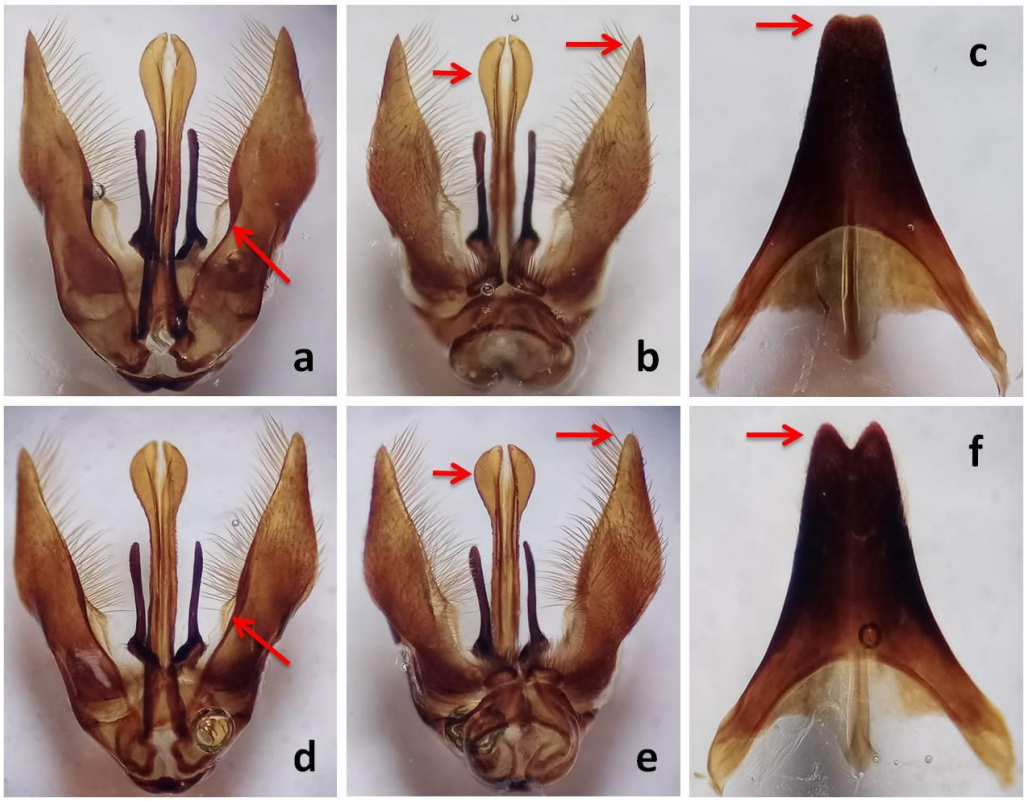

Figure 3. Genitalia and last sternites of *Larra transcaspica* (a-c) and *Larra anathema* (d-f); a, d) dorsal; b, e) ventral; c, f) last sternite

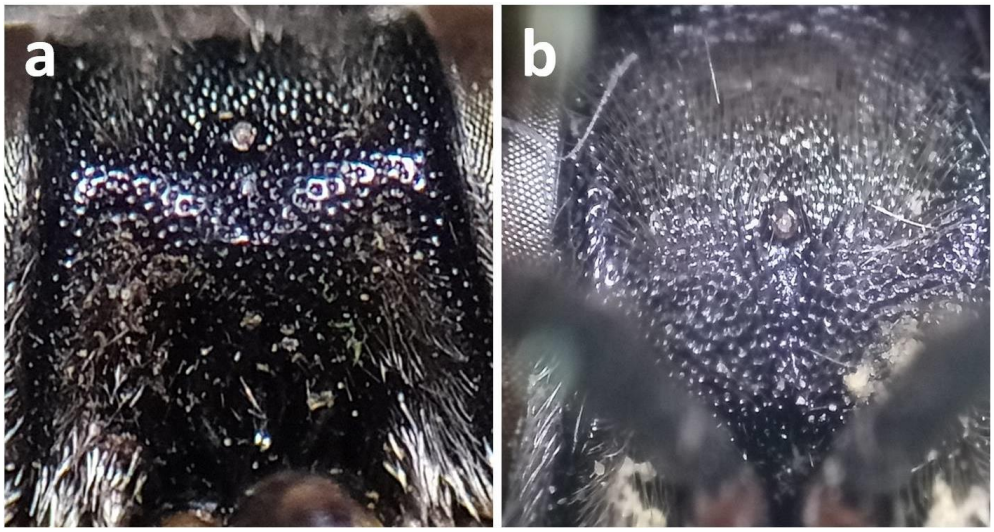

Figure 4. Frons of *Larra transcaspica* (a) and *Larra anathema* (b)

Larra transcaspica has a narrow distribution area in the world, which is so far from only from Central Asia, Iran, and United Arab Emirates (Figure 5). Far from the current distribution area, its determination in Turkey, is interesting zoogeographically. How it reached this country by overcoming geographical barriers such as the Caspian Sea and whether it is found in other countries between Turkey and the original distribution area is a subject of further research.

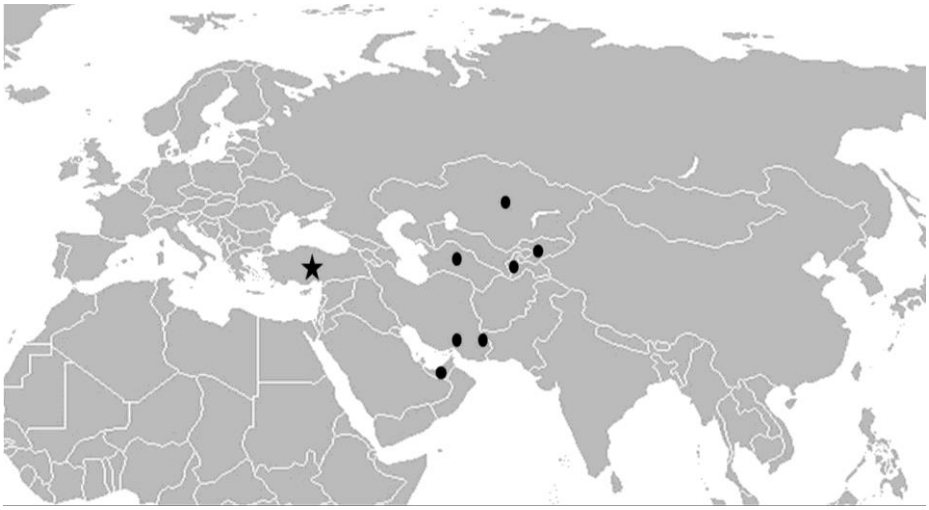

Figure 5. World distribution map of *Larra transcaspica (*Circle: previous record; Star: new record)

Since the early 1900s, many studies have been conducted on the use of *Larra* species for the control of mole cricket which qualified as an important agricultural pest. Among them, *L. bicolor* (Fabricius, 1804) species originating from South America has been successfully applied in the south of America and Puerto Rico against non-native crickets [13, 14]. Similarly, *L. polita* (F. Smith, 1858) and *L. anathema* species were tried to be settled in Hawaii for biological control of crickets [3]. However, the biology of *L. transcaspica* is not yet known and further studies are required to determine whether this species is a parasitoid of mole crickets and its role that it can play in controlling them.

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