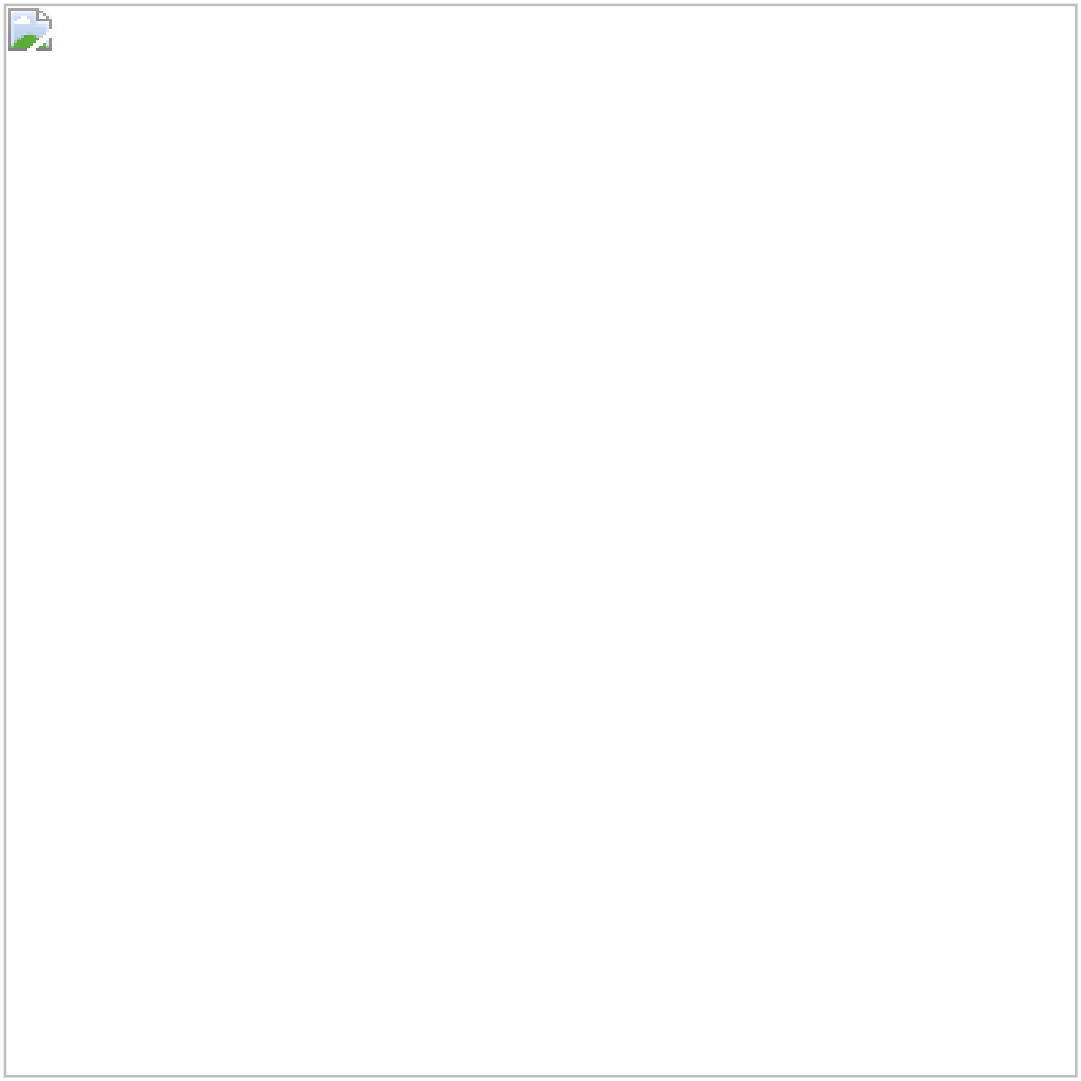


The genus Isophya Brunner von Wattenwyl (Orthoptera: Tettigoniidae: Phaneropterinae) from the Batı Karadeniz Region of Turkey, NW Anatolia

Author: Ünal, Mustafa

Source: Journal of Orthoptera Research, 12(2) : 93-103

Published By: Orthopterists' Society

URL: https://doi.org/10.1665/1082-6467(2003)012[0093:TGIBVW]2.0.CO;2

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

The genus *Isophya* Brunner von Wattenwyl (Orthoptera: Tettigoniidae: Phaneropterinae) from the Batı Karadeniz Region of Turkey, NW Anatolia

MUSTAFA ÜNAL

Abant İzzet Baysal Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 14280 Bolu, Turkey. E-mail: unal@ibu.edu.tr

Abstract

Nine *Isophya* species were studied from the Batı Karadeniz Region of Turkey and one new species, *Isophya yaraligozi*, described. Distributions, previous records, type material and type depositories are given. A key to the species of the region is provided.

Key words

Orthoptera, Phaneropterinae, *Isophya*, fauna, distribution, new species, Batı Karadeniz, West Black Sea, Turkey

Introduction

The genus *Isophya* Brunner von Wattenwyl 1878 contains about 80 species, distributed mainly through southeastern Europe, Anatolia and Caucasia. Several species are found from middle Asia, Middle East, middle and southwest Europe (Ramme 1951, Bei-Bienko 1954, Karabağ 1958, Harz 1969, Stolyarov 1997, Heller 1990, Heller *et al*. 1998). In addition, several Neotropical species [*aequatorialis* Giglio-Tos, *pulchella* Giglio-Tos, *punchtinervis* (Stål), *schoenemanni* Karsch, *brasiliensis* Br v. W., *melanochloris* Rehn] have been placed in this genus (Kirby 1906, Otte & Naskrecki 1997). However, their generic affinity needs confirmation. Forty-six species have been recorded from Europe including Caucasia and the European part of Turkey (Heller *et al*. 1998). In Turkey, 34 species have been found so far (Ramme 1951; Karabağ 1958, 1962, 1975; Maran 1958; Heller 1988; Demirsoy 1974; Naskrecki & Ünal 1995; Sevgili & Heller 2003).

The Batı Karadeniz (west Black Sea), is one of the 8 geographical regions of Turkey, and includes the provinces of Düzce, Bolu, Zonguldak, Bartın, Karabük, Kastamonu, Sinop, northern parts of Eskişehir, Çankırı and Ankara. The region is bordered by the Sakarya River in the west, Kızılırmak River in the East, the Sündiken and Köroğlu Mts in the south and the Black Sea in the north (Fig. 31). The first orthopteran records, including 2 *Isophya* species (*amplipennis, pavelii*), were given from this region by Retowski (1889). The other *Isophya* species have been recorded from the Batı Karadeniz Region by Ramme (1951), Karabağ (1958, 1964), Karabağ *et al*. (1980), Maran (1958), Heller (1988), Özdikmen (1994) and Ünal (1999, 2002). Four species (*ilkazi, obtusidens, obenbergeri, staneki*) have been described from the region by Ramme (1951) and Maran (1958).

The present paper is based on 685 specimens, belonging to 8 species, collected during the last 6 y by the author. In addition, *I. obtusidens* Ramme, which has not been recorded since its discovery, is discussed. One new species, *I. yaraligozi sp.n*., is described. A key to the species is provided for the region. Distributions, previous records in Turkey, new illustrations and type depositories are given. In addition, there are 3 maps showing the distributions of the species in the Batı Karadeniz Region.

Type material is deposited in the Abant İzzet Baysal Üniversitesi Entomoloji Müzesi, Bolu, Turkey.

Results

Isophya amplipennis Brunner von Wattenwyl, 1878
Isophya amplipennis: Brunner von Wattenwyl, 1878, Monog. Phanerop., p. 68.

Figs 1, 9, 17, 32

Type locality.— Turkey, Bursa Prov. *Syntypes* (♂♀) in the Naturhistorisches Museum, Wien.

Previous records in Turkey.— Br v. W. 1878: Bursa and Amasya provinces, 1 ♂, 2 ♀♀ (type material). Br v. W. 1882: İstanbul Prov., Bosphorus (leg. Br v. W.). Retowski 1889: Sinop and Samsun provinces (leg. O. Retowski). Ebner 1919: Turkey, Edirne Prov., Keşan, 7-1913, 1♀ (leg. Fahringer). Uvarov 1930: Kocaeli Prov., İzmit, 1928 (leg. Süreya Özek). Ramme 1951: Adana Prov., Kozan (leg. Fahringer); İstanbul Prov., Belgrad forest and Bosphorus (leg. H. Bischoff); Bilecik Prov., Bozüyük; Tokat and Urfa provinces (leg. Süreya Özek); [as *I. obtusa* Br v. W.], Sinop, Samsun (leg. O. Retowski); Karabağ 1958: Kastamonu Prov., 14-6-1949 (leg. T. Karabağ); İstanbul Prov., Kemerburgaz, Taşhavuz, 18-6-1952 (leg. E. Can). Can 1959: İstanbul Prov., Kemerburgaz, Taşhavuz, 18-6-1952 (leg. E. Can). Karabağ 1964: Kastamonu Prov., Kastamonu area, 21-7-1962, 1000 m, 2 ♂♂, 5 ♀♀ (leg. K.M. Guichard and D.H. Harvey). Karabağ et al. 1974: İstanbul Prov., Çatalca, Karacaköy, 25-6-1970, 1 ♂. Karabağ *et al*. 1980: Bursa Prov., Karacabey yolu, 10 km, 16-6-1976, 2 ♂♂, 3♀♀. Heller 1988: Bursa Prov., Uludağ, 1700 m, 23-7-1983 (leg. K.-G. Heller). Ünal 1999: Sakarya Prov., Pamukova, 110 m, 25-4-1992, 3 ♂♂ 6♀♀; Geyve, Şerefiye, 100 m, 24-4-1992, 1 ♂, 1 ♀ (leg. M. Ünal).

Material examined.— Bolu Prov., Aladağlar, Gölcük, 1200-1400 m, 12-7-1997, 2 ♂♂, 1 ♀; 11-7-1998, 10 ♂♂, 4 ♀♀; Yedigöller yolu, 1400 m, 7-6-2001, 17 ♂♂, 6 ♀♀; 1630 m, 7-6-2001, 9 ♂♂, 3 ♀♀; Aladağlar, 1550 m, 12-8-2001, 1 ♀ (leg. M. Ünal).

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

Distribution.— Known from Bulgaria, northern and northwest Turkey. In Turkey, recorded from the provinces of Edirne, İstanbul, Bursa, Bilecik, Kocaeli (İzmit), Sakarya, Kastamonu, Sinop, Samsun, Amasya and Tokat. In addition, recorded from Adana and Urfa provinces (S and SE Turkey) by Ramme (1951) [these records require confirmation]. Recorded from the Batı Karadeniz Region by Retowski (1889).

Remarks.— According to Bei-Bienko (1954) the presence of *I. obtusa* Br v. W. in Asia Minor (Sinop and Samsun) as reported by Retowski (1889) [cited by Ramme (1951)], is erroneous; in fact, that species is *I. amplipennis* Br v. W.

Isophya pavelii Brunner von Wattenwyl, 1878

Isophya pavelii: Brunner von Wattenwyl, 1878, Monog. Phanerop., p. 62.

Figs 2, 10, 18, 32.

Type locality.— Turkey, İstanbul Prov., Bosphorus. Syntypes (♂♀) in the Naturhistorisches Museum, Wien.

Previous records.— Br v. W. 1878: İstanbul Prov., Tarabya, ♂, ♀ (type material), (leg. Br v. W.). Retowski 1889: Sinop (leg. O. Retowski). Werner 1901: Bursa Prov., Gemlik (Mus. Budapest). Uvarov 1930: Ankara Prov., Elmadağ, 30-7-1930 (leg. Süreya Özek). Ramme 1951: Çanakkale Prov., Gelibolu (leg. Martin). Can 1959: İstanbul Prov., Kemerburgaz, Taşhavuz, 18-6-1952 (leg. E. Can).

Material examined.— Bolu Prov., Aladağlar, Gölcük, 1200-1400 m, 12-7-1997, 4 ♂♂, 2 ♀♀; Abant gölü, 1280 m, 22-7-1997, 1 ♂; Aladağlar, 1800 m, 11-7-1998, 11 ♂♂, 11 ♀♀ (leg. M. Ünal); Karabük Prov., Ahmetusta geçidi, 1030 m, 29-7-2000, 1 ♂, 1 ♀; Eflani, Çiftçiler Köyü, 19-7-2001, 1 ♂, 3 ♀♀; Kastamonu Prov., Devrekani, Hacıhasan Köyü, 1220 m, 17-7-2002, 4 ♂♂, 1 ♀; Sinop Prov., Gerze, Dranaz geçidi, 980 m, 19-7-2002, 3 ♂♂, 4 ♀♀ (leg. S. Ünal & M. Ünal).

Distribution.—Known only from NW Turkey. Recorded from European part of İstanbul and Çanakkale, Bursa, Sinop and Ankara provinces. Recorded from the Batı Karadeniz Region by Retowski (1889).

Isophya rectipennis Brunner von Wattenwyl, 1878

Isophya rectipennis: Brunner von Wattenwyl, 1878, Monog. Phanerop., p. 69.

Figs 3, 11, 19, 32

Type locality.— Turkey, Bursa Prov. Syntypes (♂♀) in the Naturhistorisches Museum, Wien.

Previous records in Turkey.— Br v. W. 1878: Turkey, Bursa Prov., ♂, ♀ (type material), (leg. Br v. W.). Werner 1901: Turkey, Bursa Prov., Balıklı, Uludağ, 7-1900, 1000 m, 1 ♂ (leg. F. Werner). Ramme 1951: Turkey, Bursa Prov., Karacabey (leg. Grohmann), Bursa (Türk, Mann); İzmir Prov., Petrota (leg. F. Werner); Özdikmen, 1994: [as *I. schneideri* Br v. W.], Ankara Prov., Kızılcahamam, Soguksu National Park, 1400 m, 7-8-1990, 2 ♂♂; 1500 m, 21-6-1991, 3 ♂♂; 1650 m, 2-7-1991, 1 ♂, 1 ♀; 3-7-1991, 1 ♀; [as *I. zernovi* Miram], Ankara, Kızılcahamam, Soguksu National Park, 1200 m, 11-7-1990, 1 ♀; 1400 m, 7-8-1990, 2 ♀♀ (leg. H. Özdikmen); Naskrecki 1991: 20 km E of Tekirdağ, 27, 30-6-1987, 3 ♂♂ (leg. P. Naskrecki); Ünal 1999: [as *Isophya ilkazi* Ramme], Turkey, Ankara Prov., Beştepe, 850 m, 15-6-1993, 1 ♂, 1 ♀ (leg. M. Ünal). Ünal 2002: Bolu Prov., Kartaltepe, 1950-2050 m, 1-7-2000, 1 ♂ (nymph), 1 ♀ (nymph); 13-7-2000, 10 ♂♂; 4-8-2000, 2 ♂♂, 4 ♀♀; 5-10-2000, 1 ♀; Köroğlutepe, 2200 m, 9-8-2000, 1 ♂, 1 ♀; 5 km N of Kartaltepe, 1700 m, 9-9-2000, 2 ♀♀; 5 km. NW of Tembel yaylası, 1800 m, 9-8-2000, 1 ♀ (leg. M. Ünal).

Material examined.— Düzce Prov., Gümüşova, Selamlar Köyü, 1000 m, 24-5-2001, 15 ♂♂, 2 ♀♀; Çilimli, 25-5-2001, 1 ♀; Büyükbalıklı-Ilıca yaylası, 14-6-2001, 1 ♀; 2 km S of Akçakoca, 90 m, 13-6-2000, 1 ♂, 3 ♀♀; Boğaziçi, 380 m, 13-6-2001, 1 ♀; İhsaniye Köyü, 100 m, 24-5-2001, 4 ♂♂, 1 ♀; Bolu Prov., AİBÜ kampüsü, 850 m, 10-7-1997, 3 ♂♂, 7 ♀♀; 20-8-1997, 1 ♀; Aladağlar, 1800 m, 11-7-1998, 1 ♂; Bolu, Merkez, Karamanlı Köyü, 6-6-1998, 2 ♀♀; Merkez, Kadıköy yaylası, 1550 m, 11-9-2001, 1 ♀; Kartalkaya, 26-6-1999, 3 ♂♂; 1950-2050 m, 5-7-2001, 5 ♂♂, 2 ♀♀; Kartalkaya yolu, Güvenlik yaylası, 1570 m, 1-7-2000, 2 ♂♂; 13-7-2000, 1 ♂; Gerede, Cankurtaran geçidi, 1560 m, 1-6-1998, 2 ♂♂, 2 ♀♀; Karabük il sınırı, 5-7-2000, 1 ♀; 5 km E of Gerede, 5-7-2000, 6 ♂♂, 3 ♀♀; Gökçeler Dağı, 1400 m, 5-7-2001, 2 ♂♂, 1 ♀; Gerede, Aktaş Köyü, 1300 m, 6-7-2001, 2 ♂♂, 2 ♀♀; Dörtdivan, 18-7-1997, 2 ♂♂; 8 km W of Yeniçağa, 27-6-1998, 18 ♂♂, 19 ♀♀; Yeniçağa, Dörtdivan yolu, 27-6-1998, 2 ♂♂; 1180 m, 6-7-2001, 1 ♂, 1 ♀; Yeniçağa, 1010 m, 6-7-2001, 3 ♂♂; Dörtdivan, Göynükören Köyü, 1160 m, 6-7-2001, 3 ♂♂, 1 ♀; Bolu, Yedigöller yolu, 20-7-1997, 4 ♂♂, 2 ♀♀; Yedigöller, Tuzak yayla, 1520 m, 24-6-2000, 3 ♂♂; 10-8-2000, 6 ♂♂, 1 ♀; Tuzak yayla, 1600 m, 7-6-2001, 6 ♂♂; Yedigöller yolu, 20th km, 1340 m, 24-6-2000, 5 ♂♂, 2 ♀♀; 4th km, 10-8-2000, 1 ♂, 2 ♀♀; 20th km, 1340 m, 2 ♀♀; Çele tepesi, 10-8-2000, 1 ♂, 2 ♀♀; Mengen, Kadısusuz Köyü, 18-7-1997, 8 ♂♂, 4 ♀♀; 27-6-1998, 11 ♂♂, 3 ♀♀; Mengen, Yumrutaş Köyü, 27-6-1998, 1 ♂; Mengen, 3 km E of Pazarköy, 750 m, 5-7-2000, 3 ♂♂, 7 ♀♀; 8-6-2001, 7 ♂♂, 6 ♀♀; 6 km E of Pazarköy, 1 ♂, 2 ♀♀; Mengen, Dorukhan geçidi, 850 m, 11-8-2000, 1 ♀; Pazarköy, 650 m, 8-7-2001, 1 ♂, 3 ♀♀; Mengen, Yellicedemirciler Köyü, 620 m, 8-6-2001, 1 ♂, 2 ♀♀; Devrek yolu, 700 m, 8-7-2001, 3 ♂♂; Salmanlar, Eskipazar yolu, 1230-1410 m, 8-7-2001, 7 ♂♂, 2 ♀♀; Seben, Taşlıyayla, 1400 m, 31-5-2001, 11 ♂♂, 8 ♀♀; Seben, Bozyer, 870 m, 31-5-2001, 20 ♂♂, 7 ♀♀; Kıbrıscık, Köseler Köyü, 11-5-1998, 1 ♂; Karlık Dağı, 1500 m, 15-6-1998, 2 ♂♂, 4 ♀♀; 6-7-2000, 6 ♂♂, 4 ♀♀; Bolu, Mudurnu yolu, Yenigüney Köyü, 27-6-1998, 3 ♂♂, 3 ♀♀; Mudurnu yolu, 29th km, 12-7-1998, 1 ♀; Topardıç Köyü, 1 ♂, 3 ♀♀; Güney Köy, 1110 m, 14-6-2000, 1 ♂; Mudurnu, Abant yolu, 850 m, 14-6-2000, 4 ♂♂, 1 ♀; Mudurnu yolu, 730 m, 14-6-2000, 4 ♂♂, 2 ♀♀; Göynük, Yeşilyazı Köyü, 19-7-2000, 1 ♂, 3 ♀♀; Göynük, Himmetoğlu, 720 m, 1-6-2001, 11 ♂♂, 8 ♀♀; Bey yayla, 1400 m, 1-6-2001, 15 ♂♂, 14 ♀♀; Zonguldak Prov., Dirgine, Yazıcık Köyü, 400 m, 8-6-2001, 3 ♂♂, 5 ♀♀; Karabük Prov., 7 km W of Eskipazar, 5-7-2000, 2 ♂♂, 2 ♀♀; Keltepe, 1750-1999 m, 18-8-2001, 13 ♂♂, 8 ♀♀ (leg. M. Ünal); Kastamonu Prov., Araç, Dikmen Dağı, 1570 m, 21-7-2001, 3 ♂♂, 2 ♀♀; Azdavay, Ballıdağ geçidi, 1390 m, 21-7-2001, 3 ♂♂, 1 ♀; Devrekani, Yaralıgöz Dağı, 1450 m, 17-7-2002, 1 ♂, 3 ♀♀; Esentepe, 1450 m, 17-7-2002, 1 ♀. Çankırı Prov., Işık Dağı, 1610 m, 18-7-2001, 6 ♂♂, 3 ♀♀; Çerkeş, Hasan Barajı, 1260 m, 18-7-2001, 1 ♀; Ankara Prov., Çeltikçi, 1-6-1998, 1 ♂, 4 ♀♀; 20 km N of Çeltikçi, 1-6-1998, 8 ♂, 7 ♀♀; Ayaş, Aysantı geçidi, 1190 m, 15-6-1998, 2 ♂♂, 1 ♀; Beypazarı, İnözü Vadisi, Uşakgöl Köyü, 15-6-1998, 14 ♂♂, 10 ♀♀; Küçükören Köyü, 1 ♂, 1 ♀; Küçükören Köyü, 11-5-1998, 7 ♂♂, 10 ♀♀; Nallıhan, Danişment, 880 m, 31-5-2001, 3 ♂♂, 2 ♀♀ (leg. S. Ünal & M. Ünal).

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

Distribution.— Known from Romania, Bulgaria and NW Turkey. Recorded in Turkey from Tekirdağ, İzmir, Bursa and Bolu provinces. Recorded from the Batı Karadeniz Region by Ünal (2002).

Remarks.— This species exibits minor differences in the shape of the cercus, tegmina, ovipositor and body size between populations from high and low elevations. Highland specimens are smaller than lowland ones. In addition, the male cercus is straighter over the basal 4/5, more curved in the apical 1/5; ratio of male tegmina to pronotum is smaller; the serrated apical part of the ovipositor is narrower in highland specimens. All other features are similar. This is the commonest species of the genus *Isophya* in the western part of Batı Karadeniz Region. Özdikmen (1994) recorded 2 species, *I. schneideri* Br v. W. and *I. zernovi* Miram, from Soğuksu National Park, Kızılcahamam, in Ankara Province. These records are erroneous and the specimens belong rather to *I. rectipennis* Br v. W.

Isophya obenbergeri Maran, 1958
Isophya obenbergeri: Maran, 1958, Acta Ent. Mus. Nat. Pragae, 32: 288.
Figs 4, 4a, 13, 20, 32

Type locality.— Turkey, Çankırı Prov., Ilgaz Dağı. Holotype ♂ in the Musei Nationalis Pragae.

Previous records.— Maran 1958: Çankırı Prov., Ilgaz Dağ, iyi su (eyi-su), 7-1931, 2 ♂♂, 1 ♀ (type material), (leg. J.V. Stanek).

Material examined.— Çankırı Prov., Ilgaz Dağı, 2080 m, 16-7-2002, 1 ♂; Kastamonu Prov., Kırık Köyü, 1180 m, 16-7-2002, 1 ♂; Saraycık Dağı, Çiftlik Köy, 1180 m, 19-7-2002, 2 ♂♂; 1240 m, 1 ♂, 1 ♀; Tosya, Tosya Ilgaz geçidi, 1650 m, 19-7-2002, 17 ♂♂, 6 ♀♀; Sinop Prov., Gerze, Hıdıllık yaylası, 1320 m, 18-7-2002, 2 ♂♂, 3 ♀♀ (leg. S. Ünal & M. Ünal).

Distribution.— Known only from the type locality, northwest Anatolia.

Remarks.— These are the first records of this species since the original description.

Isophya ilkazi Ramme, 1951
Isophya ilkazi: Ramme, 1951, Mitt. zool. Mus. Berlin, 27: 167.
Figs 5, 14, 21, 32.

Type locality.— Turkey, Çankırı Prov., Ilgaz Dağ. Holotype ♂ in the Natural History Museum London.

Previous records.— Ramme 1951: Çankırı Prov., Ilgaz Dağ (Ilkaz dagh), 6500 ft., 12-8-1931, 3 ♂♂, 9 ♀♀ (type material), (leg. B.P. Uvarov). Karabağ 1958: Ankara, 10-6-1948, 1 ♀; 4-6-1940, 1 ♂; 7-4-1940, 1 ♀; 13-6-1944, 1 ♂ (leg. T. Karabağ). Maran 1958: [as *Isophya ilgazi* Ramme], Çankırı Prov., Ilgaz Dağ, 7-1931, 2 ♂♂, 2 ♀♀ (leg. J.V. Stanek). Ünal 1999: Çankırı, Ilgaz Dağ, 2100 m, 19-8-1993, 1 ♀ (leg. S. Ünal).

Material examined.— Çankırı Prov., Ilgaz Dağı, 16-7-2002, 1780 m, 3 ♂♂, 6 ♀♀; 2080 m, 9 ♂♂, 3 ♀♀; Kastamonu Prov., Kırık Köyü, 1180 m, 16-7-2002, 2 ♂♂, 3 ♀♀; Taşköprü, Çiftlik Köy yolu, 1010 m, 19-7-2002 (leg. S. Ünal & M. Ünal).

Distribution.— Known only from Çankırı and Ankara provinces, northwest Anatolia.

Remarks.— Two specimens of *I. ilkazi* from Ankara Province recorded by Ünal (1999), are in fact *I. rectipennis*. Also, Karabağ's specimens from Ankara probably belong to *I. rectipennis*.

Isophya nervosa Ramme, 1951
Isophya nervosa: Ramme, 1951, Mitt. zool. Mus. Berlin, 27: 166.
Figs. 6, 6a, 12, 22, 33

Type locality.— Turkey, Ankara Prov., Hüseyin Gazi Dağ. Holotype ♂ in the Zoologischen Museum für Naturkunde der Humbolt-Universitat, Berlin.

Previous records.— Karabağ 1949: [as *Isophya nervosa* Ramme (in litt.)], Ankara Prov., Hüseyingazi Dağı, 5,6-1941, 1942; in steppe, 5,6-1939, 1941, 1942, many specimens (leg. T. Karabağ). Ramme 1951: Ankara Prov., Hüseyingazi Dağı, 13, 17-6-1941, 2 ♂♂, 2 ♀♀ (type material); Etlik, 10-6-1941, 1 ♀; Dikmen, 1 ♀ (leg. T. Karabağ); Ankara Prov., Elmadağ, 30-7-1930, 1 ♂ (leg. B.P. Uvarov); Ankara Prov., 10-6-1931, 2 ♂♂ (leg. Süreya Özek). Karabağ 1958: Ankara Prov., Emir gölü, 16-6-1942, 6 ♂♂, 3 ♀♀; 24-6-1954, 4 ♂♂, 6 ♀♀ (leg. T. Karabağ). Maran 1958: Ankara Prov., Baraj, 3, 4-7-1947, 5 ♀♀. Gümüşsuyu 1968: Ankara Prov., Güdül, Alagöz mevki, 14-6-1965, 1 ♂, 1 ♀; Avşar Köyü, Alpınar mevki, 15-6-1965, 14 ♂♂, 7 ♀♀; Sapanlı Köyü, 15-6-1965, 1 ♀ (leg. İ. Gümüşsuyu). Karabağ et al., 1971: Ankara Prov., Bağlum, 18-6-1969, 11 ♂♂, 8 ♀♀; 8-7-1969, 2 ♂♂; 22-5-1969, 4 ♂♂, 4 ♀♀. Karabağ *et al*. 1980: Eskişehir Prov., Sarıcakaya, 2-6-1974, 1 ♂, 5 ♀♀; Sarıcakaya, Ulubük Köyü, 2-6-1975, 3 ♂♂, 6 ♀♀; Nevşehir Prov., Hacıbektaş, Kütükçü Köyü, 26-6-1973, 3 ♂♂, 7 ♀♀; Avanos, Göynük Köyü, 26-6-1973, 2 ♂♂, 2 ♀♀. Ünal 1997: Nevşehir Prov., Avanos, Köybağı, 1100 m, 13-6-1992, 1 ♂; 15-6-1992, 1 ♀; 26-4-1993, 4 ♂♂, 6 ♀♀; 28-4-1993, 2 ♂♂, 3 ♀♀; 11-6-1993, 3 ♂♂, 2 ♀♀; Avanos, Ziyaret Dağı, 1565 m, 13-6-1993, 7 ♂♂, 1 ♀; Ürgüp, Boyalı, 1250 m, 11-6-1993, 18 ♂♂, 1♀; Ürgüp, Karacaören, 1300 m, 11-6-1993, 1 ♂, 2 ♀♀ (leg. M. Ünal). Ünal 1999: Ankara Prov., Bala, 1250 m, 10-6-1993, 1 ♀; Kurtboğazı, 1000 m, 27-6-1993, 2 ♂♂, 4 ♀♀; Eymir lake, 800 m, 5-6-1993, 3 ♂♂; Bağlum, 1200 m, 22-5-1994, 3 ♂♂, 6 ♀♀ (leg. M. Ünal); Ankara Prov., 10 km W of Ankara, 1000 m, 15-8-1993, 3 ♂♂, 1 ♀ (leg. A.Ö. Koçak).

Material examined.— Bolu Prov., Mengen, Salmanlar, Eskipazar yolu, 1230-1410 m, 8-7-2001, 3 ♂♂, 2 ♀♀; Karabük Prov., 9 km W of Eskipazar, 5-7-2000, 1 ♀; İsmetpaşa- Ovacık arası, 9-7-2001, 1250 m, 2 ♂♂, 3 ♀♀ (leg. M. Ünal); 1480 m, 17-7-2001, 9 ♂♂, 11 ♀♀ (leg. S. Ünal & M. Ünal); Keltepe, 1750-1999 m, 16-8-2001, 4 ♂♂, 2 ♀♀ (M. Ünal); Ankara Prov., Çeltikçi, 1-6-1998, 7 ♂♂, 7 ♀♀; Ayaş, Aysantı geçidi, 1190 m, 15-6-1998, 2 ♂♂, 1 ♀; Çankırı Prov., Kurşunlu, Kargöçüren beli, 1480 m, 21-7-2001, 3 ♂♂; Çankırı Prov., İndağ geçidi, 1420 m, 16-7-2002, 8 ♂♂, 5 ♀♀ (leg. S. Ünal & M. Ünal).

Distribution.— Known from Middle Anatolia and the southeast of Batı Karadeniz Region. Recorded from Ankara, Eskişehir and Nevşehir provinces. Found also in Kırşehir and Kırıkkale provinces in Middle Anatolia (unpub. data, Ünal 1997). Recorded from the Batı Karadeniz Region by Karabağ *et al*. (1980).

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

Isophya obtusidens Ramme, 1951
Isophya obtusidens: Ramme, 1951, Mitt. zool. Mus. Berlin, 27: 167.
Fig. 23, 33

Type locality.— Turkey, Çankırı Prov., Kay Dağ. Holotype ♀ in the Natural History Museum London.

Previous records.— Ramme 1951: Çankırı Prov., between Ankara and Çankırı, Kay Dağ, 10-8-1931, 2 ♀♀ (type material), (leg. B.P. Uvarov).

Distribution.— Known only from type locality, NW Anatolia.

Remarks.— Ramme (1951) has described this species on the basis of 2 females collected between the Batı Karadeniz and the Middle Anatolia Regions in Çankırı Prov. According to Ramme *I. obtusidens* closely resembles *I. nervosa,* and differs from it only in the blunt apical teeth of the ovipositor (Fig. 23). Bei-Bienko (1954) and Maran (1958) have also cited Ramme (1951). All my specimens collected from that region belong to *I. nervosa*. There are good images of types of both species in the OSF online (Otte & Naskrecki 1997). The holotype of *I. obtusidens* Ramme is probably just an older female of *I. nervosa*. Ramme's type material (2 females) need confirmation.

Isophya yaraligozi *sp.n.*
Figs 7, 7a, 15, 24, 26-30, 33

Type locality.— Turkey, Kastamonu Prov., Devrekani, Yaralıgöz Dağı. Holotype ♂ deposited in the Abant İzzet Baysal Üniversitesi Entomoloji Müzesi, Bolu.

Description.— **Male**: Fastigium of vertex slightly narrower than antennal scape (ratio 0.7:0.8), in one male slightly broader (0.9:0.8). Pronotum (Figs 28, 29) cylindrical in anterior part, moderately widened in metazona; anterior margin straight, in some males slightly concave; posterior margin convex; sulcus behind middle of pronotal disc; pronotum concave in lateral view, metazona weakly raised (Fig. 29). Tegmina (Figs 28, 29) reaching beyond 2nd abdominal tergite, slightly longer than pronotum; inner margin of left tegmen slightly protruding beyond outer margin of pronotum; stridulatory vein (Cu2) long and thick, as wide as 2nd antennal segment, only 1.26× shorter than hind margin of pronotum. Hind femur unarmed ventrally, in 1 male with 1 small spine at apical part of right hind femur. Ratio pronotum to fore femur— 1:1.2. Supraanal plate with broadly rounded apex (Fig. 27), in one male pentagonal (Fig. 27a); 1.7× broader than long. Cercus (Fig. 7) moderately stout; basal part widened and conical, strongly incurved just beyond middle; in some males cercus more inward curving (Fig. 7a), its apex blunt, with a large subapical tooth. Subgenital plate (Fig. 15) 1.7× longer than wide, strongly narrowed at apex with shallow, round incision; its apical lobes with rounded apices.

Female: Fastigium of vertex as broad or somewhat narrower than antennal scape. Pronotum (Fig. 30) cylindrical, slightly widened in metazona; almost straight in lateral view; anterior margin slightly concave, posterior margin convex in dorsal view. Tegmina (Fig. 30) reaching beyond half of 1st abdominal tergite, almost half of pronotal length; in one female 2.6× shorter than pronotum. Right hind femur with one spine at apical half ventrally, in other females hind femur unarmed. Supraanal plate 2× broader than long, with rounded apex. Cercus conical, slightly incurved at apex; a little longer than supraanal plate. Ovipositor (Fig. 24) relatively long, 2.3× longer than pronotum; ratio ovipositor to hind femur: 1:1.6; lower and upper valves with 6 apical teeth. Gonangulum and basal fold of lower valve as in Fig. 24. Subgenital plate (Fig. 26) distinctly broader than long, with small, round lobe at apex.

Color.— Body various shades of green yellow, reddish-brown and cream. Face light green. Dorsal surface of head, pronotum, hind femora and abdominal tergites with dark spots of various size. Metazona of pronotum with brown bands on both sides. Veins of tegmina dark green except Cu2, area between them greenish-brown; Cu2 cream; costal margin of tegmina with light green band along its length. All legs green; fore and middle tibia with irregular, dark green stripes. Abdomen with 2 light bands along its length, with reddish-brown spots. Ovipositor green and creamy-green; its apical teeth reddish-brown.

Measurements (mm).— Length of body: ♂ 20.7 to 23.1, ♀ 22 to 24; pronotum: ♂ 4.6 to 5, ♀ 5 to 5.2; tegmen: ♂ 5.2 to 5.7, ♀ 2 to 2.6; hind femur: ♂ 17 to 18.1, ♀ 17.8 to 19; ovipositor: 11.1 to 11.6.

Diagnosis.— This new species is distinguished from known related species in the genus *Isophya* Bei-Bienko by its broad fastigium vertictis, nearly as broad as or slightly broader than the antennal scape, by the male cercus with its larger subapical denticle that always protrudes beyond the cercal apex, by the longer or thicker stridulatory vein, the smaller size and the shorter ovipositor.

Other similarities and differences are as follows: this new species belongs to the *I. modesta* Frivaldsky group (see Bei-Bienko 1954). It is closely related to *I. obtusa* Br v. W. 1882 from Yugoslavia, Romania and Bulgaria by measurements of its ovipositor and hind femur, by the ratio of pronotum to ovipositor (1:2.3 to 1:2.5 in *I. obtusa*) and the general shape of the male cercus. But differs from it in pronotal shape, pronotum with convex hind margin, less concave in lateral view and in the shape of the male supraanal plate. It is also near to *I. modesta* Frivaldsky 1867 from the Western Balkans, but differs from it by the shape of the male cercus, supraanal plate, the measurements, the thicker stridulatory vein, and the shape of male subgenital plate. It differs from *I. rossica* Bei-Bienko 1951 from Ukraine by the shape of the pronotum, female subgenital plate, and by the measurements. From *I. rhodopensis* Ramme 1951 from Bulgaria by the longer stridulatory vein, the shape of the male cercus and the supraanal plate. Differs from *I. modestior* Br v. W., 1882 from Balkans and *I. costata* Br v. W. 1878 from Middle and Eastern Europe by the shape of the male cercus, subgenital plate, and supraanal plate, by the ratio of male pronotum to tegmina; the tegmina is always longer than the pronotum in the new species. In *I. costata,* the width of the fastigium of vertex is as in the new species. *I. yaraligozi* differs from *I. bureschi* Peschev 1959 of Bulgaria by having a longer stridulatory vein and by the shape of the supraanal plate. From *I. petkovi* Peschev 1959 also from Bulgaria it differs by the shape of supraanal plate, the smaller size, and the shorter ovipositor. It differs from *I. kisi* Peschev 1981 from Bulgaria by the shape of pronotum, tegmina, cercus and supraanal plate.

Type Material.— Kastamonu Prov., Devrekani, Yaralıgöz Dağı, 1450 m, 17-7-2002, 3 ♂♂, 3 ♀♀; Esentepe, 1450 m, 17-7-2002, 1 ♂ (leg. S. Ünal & M. Ünal).

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

Etymology.— The specific epithet is derived from "Yaralıgöz" Mountain, the type locality of this new species.

Habitat.— Open area within *Abies nordmanniana* and *Pinus sylvestris* forest.

Isophya staneki Maran, 1958
Isophya staneki: Maran, 1958, Acta Ent. Mus. Nat. Pragae, 32: 291. Figs 8, 16, 25, 33

Type locality.— Turkey, Çankırı Prov., Ilgaz Dağ. *Syntypes* (♂♀) in the Musei Nationalis Pragae.

Previous records.— Maran 1958: Çankırı Prov., Ilgaz Dağ, 7-1931, 4 ♂♂, 3 ♀♀ (type material), (leg. J.V. Stanek). Heller 1988: Kastamonu Prov., Ilgaz Dağ, 1800 m, 16, 17-8-1983 (leg. K.-G. Heller).

Material examined.— Çankırı Prov., Ilgaz Dağı, 2080 m, 17-7-2002, 6 ♂♂, 3 ♀♀ (leg. S. Ünal & M. Ünal).

Distribution.— Known only from Ilgaz Dağ in Çankırı and Kastamonu provinces, northwest Anatolia.

Key to the *Isophya* Br v. W. species of the Batı Karadeniz Region

1. Fastigium of vertex narrower than half width of antennal scape. Male pronotum strongly concave in lateral view. Male subgenital plate as in Fig. 9. Ovipositor (Fig. 17) shorter than 9 mm. Gonangulum and basal fold of lower valve as in Fig. 17 . . . . . *amplipennis*
– Fastigium of vertex broader than half of antennal scape. Male pronotum straight or slightly concave in lateral view. Ovipositor longer than 9 mm. Gonangulum and basal fold of lower valve as in Figs 18-25. 2

2. Fastigium of vertex much broader (nearly 2 times) than antennal scape. Male cercus short (Fig. 8). Female tegmina truncate at hind margin. Male subgenital plate as in Fig. 16. Gonangulum and basal fold of lower valve as in Fig. 25 . . . . . *staneki*
– Fastigium of vertex slightly narrower, as broad as or slightly broader than antennal scape. Male cercus relatively long (Figs 1-7a). Female tegmina rounded at hind margin. Gonangulum and basal fold of lower valve as in Figs 18-24 3

3. Ovipositor with blunt apical teeth (Fig. 23) . . . . . *obtusidens*
– Ovipositor with sharp apical teeth (Figs 18-22) 4

4. Stridulatory vein clearly longer than half breadth of pronotum hind margin, at least 2/3 of hind margin of pronotum (Fig. 28) . . 5
– Stridulatory vein as long as or slightly longer than half of hind margin of pronotum. In latter case never reaching to 2/3 of hind margin of pronotum 7

5. Ratio of stridulatory vein and hind margin of pronotum 3:4 (Fig. 28). Male cercus (Figs 7, 7a) relatively stout, sharply incurved at apical 1/3; with blunt apex, armed with a large subapical denticle. Male subgenital plate (Fig. 15) with shallow incision at apex. Gonangulum and basal fold of lower valve as in Fig. 24 . . . . . .*yaraligozi sp.n.*
– Ratio of stridulatory vein and hind margin of pronotum 2/3. Male cercus more slender, gradually incurved; pointed with 1 or 2 apical denticles (Figs 5-6a). Male subgenital plate with deep incision at apex (Figs 12, 14). Gonangulum and basal fold of lower valve as in Figs 21, 22 6

6. Male cercus with one apical denticle; incurved gradually along its lenght (Fig. 5). Male subgenital plate as in Fig. 14. Gonangulum and basal fold of lower valve as in Fig. 21 . . . . . *ilkazi*
– Male cercus with 2 contiguous apical denticles, upper one more distinct; incurved gradually at apical 2/5 (Figs 6, 6a). Male subgenital plate as in Fig. 12. Gonangulum and basal fold of lower valve as in Fig. 22 . . . . . *nervosa*

7. Fastigium of vertex slightly broader than antennal scape. Male pronotum cylindrical in anterior part, moderately widened in posterior part. Male cercus sharply tapering to apex, pointed with a large apical denticle (Fig. 2). Stridulatory vein very distinct. Tegmina clearly longer than pronotum. Male subgenital plate as in Fig. 10. Gonangulum and basal fold of lower valve as in Fig. 18 . . . *pavelii*
– Fastigium of vertex as broad as, or slightly narrower than, antennal scape. Male pronotum almost cylindrical along its length. Male cercus gradually tapering to apex, armed with a small apical denticle (Figs 3-4a). Stridulatory vein mostly indistinct. Tegmina just a little longer than pronotum. Male subgenital plate as in Figs 11, 13. Gonangulum and basal fold of lower valve as in Figs 19, 20 8

8. Fastigium of vertex mostly a little narrower than antennal scape. Male cercus slender, almost straight, incurved over apical 1/4 to 1/5, pointed with a small apical denticle (Fig. 3). Male subgenital plate as in Fig. 11. Gonangulum and basal fold of lower valve as in Fig. 19. . . . . .*rectipennis*
– Fastigium of vertex almost as broad as antennal scape. Male cercus stout, with blunt apex, incurved over apical 2/5 to 1/3, armed with more indistinct subapical denticle (Figs 4, 4a). Male subgenital plate as in Fig. 13. Gonangulum and basal fold of lower valve as in Fig. 20. . . . . *obenbergeri*

Acknowledgments

I would like to thank Dr. Daniela Pilarska for helping me to obtain some publications; thanks also to Drs Ayla Tüzün, Cevdet Zeki, Yasemin Özdemir and Mustafa Özdemir for their help during my studies in the Zoological Museum of Ankara University and the Zoological Museum of Ankara Plant Protection Research Institute. Thanks to Selma Ünal for helping me with collecting. The field studies in Bolu Province were partly supported by the Abant İzzet Baysal University research fund.

References

Bei-Bienko G.Ya. 1954. Fauna of the U.S.S.R. (Phaneropterinae, Tettigonioidea: Orthoptera). Zoological Institute of the U.S.S.R. Academy of the Sciences 59: 1-375.

Can E. 1959. Zur Kenntnis von *Isophya amplipennis* Br.v.W., *I. pavelii* Br.v.W and *I. tenuicerca* Rme. (Orth.. Tettigoniidae), als Schadlinge von Eichenniederwaldern in Südosteuropa, Teil I.- Zeitschrift für angewandte Entomologie 43: 387-411, Hamburg.

Demirsoy A. 1974. Some new Tettigoniidae (Orthoptera) from Turkey. Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg 4: 523-529.

Ebner R. 1919. VI. Orthopteren aus Kleinasien. Arch. F. Natg. Berlin 185: 148-161.

Gümüşsuyu İ. 1968. Ankara-Güdül Bölgesinin Orthoptera Faunası Üzerinde Sistematik Araştırmalar. Bitki Koruma Bülteni 8: 115-124.

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

Harz K. 1969. The Orthoptera of Europe (Die Orthopteren Europas). Dr. W. Junk N. V.,I. Series entomologica 5: The Hague, 1: 1-749.

Heller K.-G. 1988. Bioakustik der Europäischen Laubheuschrecken. J. Margraf, Weikersheim.

Heller K.-G. 1990. Evolution of song pattern in East Mediterranean Phaneropterinae: constraints by the communication System, pp. 130-151. In: Bailey W.J., Rentz D.C.F. (Eds) The Tettigoniidae: Biology, Systematics and Evolution. Crawford House Press, Bathurst, Australia, 395 pp.

Heller K.G., Korsunovskaya O., Ragge D.R., Vedenina V., Willemse F., Zhantiev R.D., Frantsevich L. 1998. Check-list of European Orthoptera. Articulata 7: 1-61.

Karabağ T. 1949. Ankara vilayeti dahilinde mevcut çekirgelerin ekolojik, cografik ve sistematik durumları üzerine arastırmalar. Ankara Üniversitesi yayınları 4: 1-121.

Karabağ T. 1953. Some new Orthoptera from Turkey. Eos 29: 177-200.

Karabağ T. 1957. Some new Orthoptera from Turkey. Communications Fac. Sci. Univ. Ankara (c) 8: 13-18.

Karabağ T. 1958. Türkiye'nin Orthoptera faunası (The Orthoptera Fauna of Turkey). Ankara Üniversitesi Fen Fakültesi yayınları. 81: 1-198.

Karabağ T. 1962. Some new and little known Phaneropterinae (Orthoptera: Tettigoniidae) from Turkey. The Proceedings of the Royal Entomological Society of London (B) 31: 4-10.

Karabağ T. 1964. Some new species and new records of Tettigoniidae (Orthoptera) from Turkey. Communications Fac. Sci. Univ. Ankara (c), 13:36-55.

Karabağ T., Gümüşsuyu İ., Balamir S.,Tutkun E. 1971. Türkiye Orthoptera Faunasının Tesbiti Üzerinde Arastırmalar. Bitki Koruma Bülten 11: 73-98.

Karabağ T., Gümüşsuyu İ., Balamir S., Tutkun E. 1974. Türkiye Orthoptera Faunasının Tesbiti Üzerinde Arastırmalar. Bitki Koruma Bülteni 14: 2-18.

Karabağ T. 1975. Studies in the Turkish Orthoptera (Insecta). I. New species and less known Tettigoniidae. Journal of Natural History 9: 337-350.

Karabağ T., Gümüşsuyu İ., Tutkun E. 1980. Türkiye Orthoptera Faunasının Tesbiti Üzerinde Arastırmalar. Bitki Koruma Bülteni 20: 1-25.

Kirby W.F. 1906. A Synonymic Catalogue of Orthoptera. Orthoptera Saltatoria (Achetidae et Phasgonuridae). Trustees of the British Museum, London, 562 pp.

Kis B. 1960. Revision der in Rumanien Vorkommenden *Isophya*- Arten (Orthoptera, Phaneropterinae). Acta Zoologica Academia Scientiarum Hungaricae 6: 349-369.

Maran J. 1958. Wissenschaftliche Ergebnisse der Zoologischen expedition des Nationalmuseums in Prag nach der Türkei. Orthoptera - Tettigoniidae – Gattung *Isophya* Br. W. Acta Entomologica Musei Nationalis Pragae 32: 285-293.

Miram E.F. 1938. New species of the Genera *Poecilimon* Fisch. Fr. and *Isophya* Br. W. (SubF. Phaneropterinae Fam. Tettigoniodea- Long Horned Grasshoppers) of the Fauna of the USSR. Zoologichesky Zhurnal 17: 348-372.

Naskrecki P. 1991. Contribution to the knowledge of Orthoptera of European Turkey, with description of *Poecilimon marmaraensis* sp.nov. (Orthoptera: Phaneropterinae). Priamus 5: 157-171.

Naskrecki P., Ünal M. 1995. The Orthoptera of Hatay Province, S. Turkey. Beitrage zur Entomologie 45: 393-419.

Otte D., Naskrecki P. 1997. Orthoptera Species File Online. http://tettigonia.com

Özdikmen H. 1994. On the Coleoptera, Orthoptera and Odonata (Insecta) of Soğuksu National Park (Kızılcahamam, Ankara). Gazi Üniversitesi Fen Bilimleri Dergisi 4: 21-38.

Peschev G. 1959. Une nouvelle espece du gengre *Isophya* Br v. W. (Orthoptera, Tettigoniidae) de Bulgarie. Acad. Bulg. Sci. Bull. Inst. Zool. Mus. 12: 251-253.

Peschev G. 1959. Une nouvelle espece d'*Isophya* Br v. W. (Orthoptera, Tettigoniidae) de Bulgarie. Acad. Bulg. Sci. Bull. Inst. Zool. Mus. 12: 255-258.

Peshev G. P. 1981. A contribution to the investigations on the species of the genus *Isophya* Br v. W. (Orthoptera, Tettgoniidae) from Bulgaria. Acta Zoologica Bulgarica 17: 27-37.

Peshev G. P. 1985. A contribution to the studies of the species of genus *Isophya* Br v. W. (Orthoptera, Tettgoniidae) in Bulgaria II. Acta Zoologica Bulgarica 29: 3-16.

Ramme W. 1951. Zur Systematik Faunistik und Biologie der Orthopteren von Südost Europa und Vorderasien. Mitteilungen aus dem Zoologischen Museum in Berlin 27: 1-431.

Retowski O. 1889. Verzeichnis der von mir auf meiner Reise von Konstantinopel nach Batum gesammelten Orthoperen Ber. Senkenberg. Nuturf. Ges. Frankfurtam Main, pp 217-223.

Sevgili H., Heller K.-G. 2003. A new species of the genus *Isophya* Brunner von Wattenwyl from Turkey (Orthoptera, Tettigoniidae, Phaneropterinae). Tijdschrift voor Entomologie 146: 39-44.

Stolyarov M.V. 1997. Peculiarities of the Genesis of the Orthopteran Fauna in Transcaucasia: 5. Endemism and Some General Peculiarities of the Genesis of the Fauna in This Region. Entomological Review 77: 66-74.

Uvarov B.P. 1930. Orthoptera collected by M. Sureya Bey in Turkey. Eos 6: 349-373.

Uvarov B.P. 1940. Two new Orthoptera from Turkey. Annals and Magazine of Natural History 6: 522-527.

Ünal M. 1997. Nevşehir ili Avanos çevresinin Orthopterlerinin eko-faunası üzerine araştırmalar. Priamus 9: 1-54.

Ünal M. 1997 (unpublished). Kırıkkale Orthopterlerinin Fauna, Ekoloji ve Taksonomisi Üzerine Araştırmalar. Ph. D. thesis, Gazi Üniversitesi Fen Bilimleri Enstitüsü, Ankara, 212 pp.

Ünal M. 1999. Notes on Orthoptera of Western Turkey, with description of a new genus and four new species. Journal of Orthoptera Research 8: 243-255.

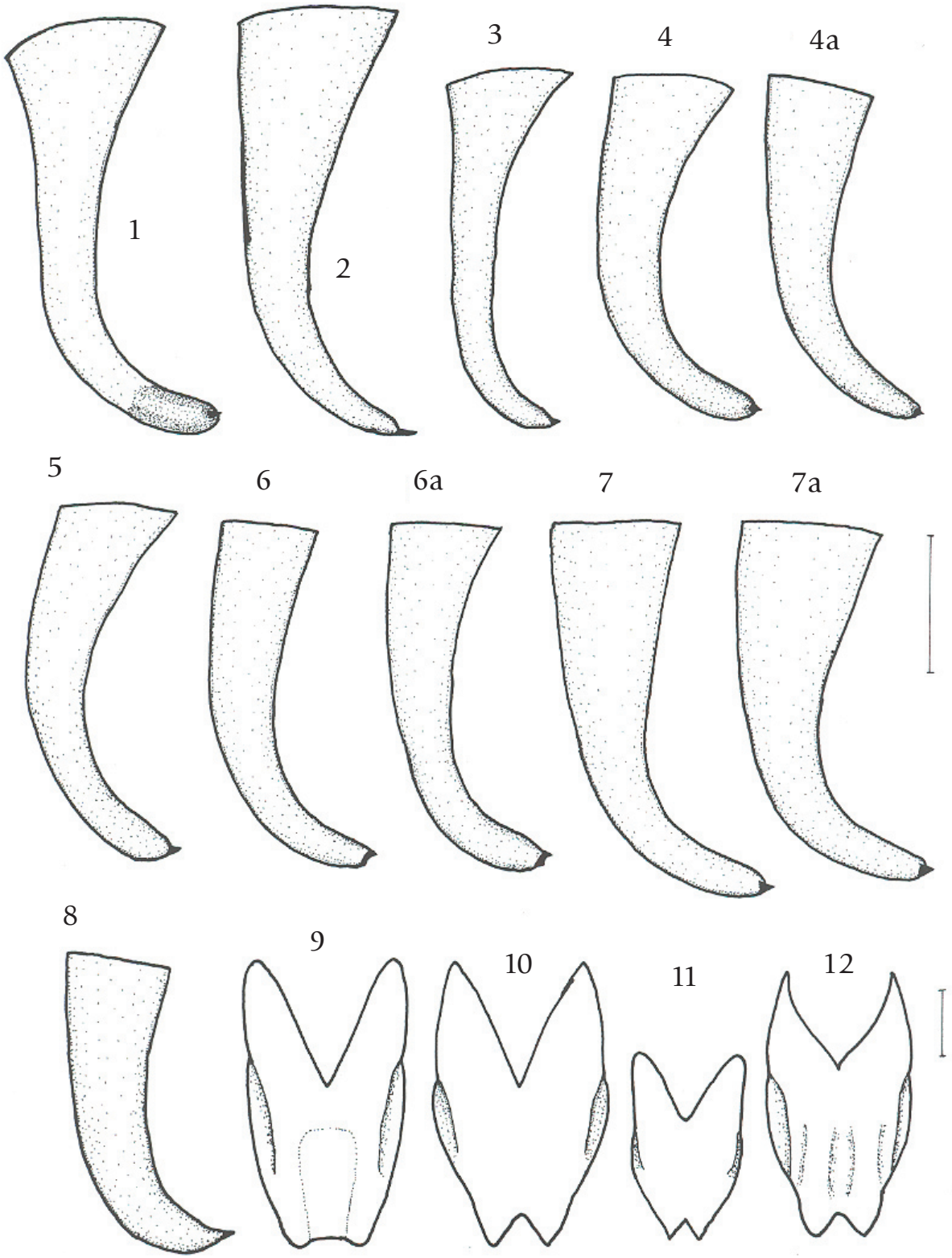
Ünal M. 2002. First data on Orthoptera of Mount Köroğlu, NW Anatolia, with description of three new taxa. Entomological News 113(4): 275-288.

Ünal M. 2003. Checklist of the Turkish Orthoptera. http://www.members.tripod.com/Cesa88/orthtr.htm

Werner F. 1901. Die Dermapteren und Orthopterenfauna Kleinasiens. Sitzb.Akad. Wiss. Mathem.-nat. 110: 259-306.

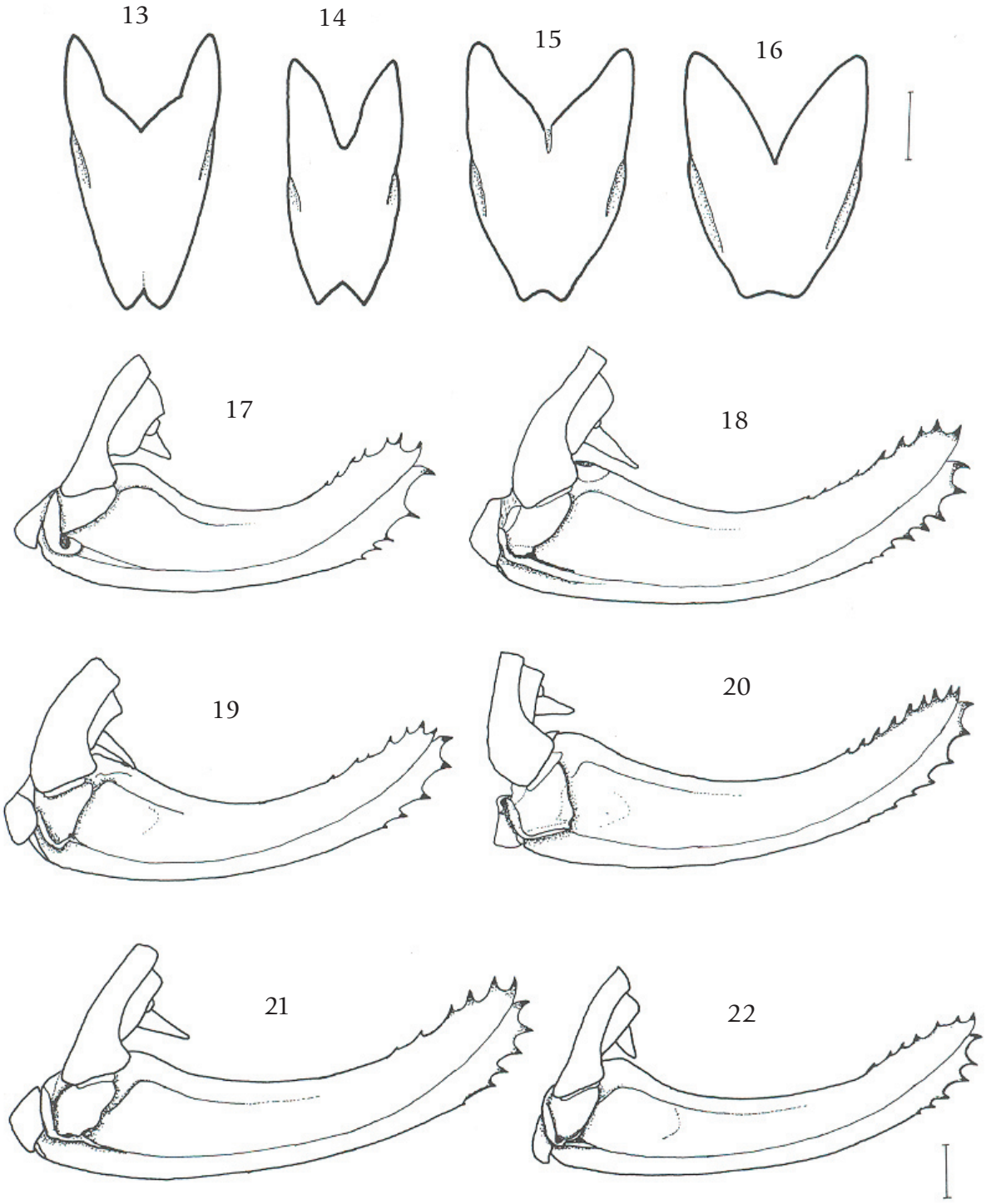
Willemse F. 1984. Catalogue of the Orthoptera of Greece. Fauna Greciae 1: 1-275.

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use



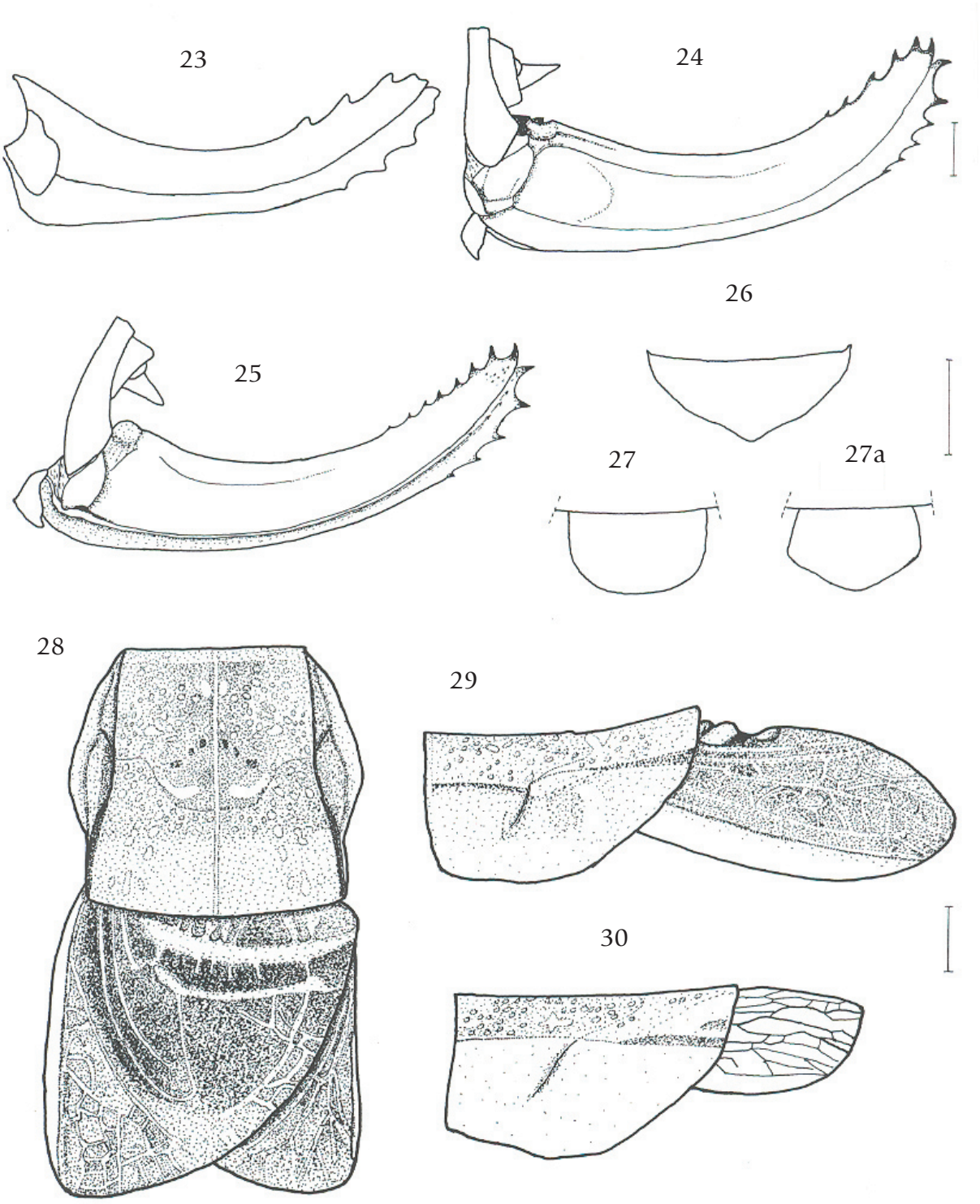
Figs 1-8. Male left cercus, *Isophya* spp.: **1** *amplipennis*; **2** *pavelii*; **3** *rectipennis*; **4, 4a** *obenbergeri*; **5** *ilkazi*; **6, 6a** *nervosa*; **7, 7a** *yaraligozi* sp.n.; **8** *staneki*. **9-12.** Male subgenital plate: **9** *amplipennis*; **10** *pavelii*; **11** *rectipennis*; **12** *nervosa*. Scales 1 mm.

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use



Figs 13-16. Male subgenital plate: **13** *obenbergeri*; **14** *ilkazi*; **15** *yaraligozi* sp.n.; **16** *staneki*. **17-22.** Ovipositor: **17** *amplipennis*; **18** *pavelii*; **19** *rectipennis*; **20** *obenbergeri*; **21** *ilkazi*; **22** *nervosa*. Scales 1 mm.

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use



Figs 23-30. Ovipositor: **23,** *obtusidens* (from Ramme 1951); **24,** *yaraligozi* sp.n.; **25** *staneki*. **26-30** *Isophya yaraligozi* sp.n.: **26** female subgenital plate; **27, 27a** supra-anal plate; **28** male pronotum and tegmina, dorsal view; **29** same in lateral view; **30** female pronotum and tegmina, lateral view. Scales 1 mm.

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

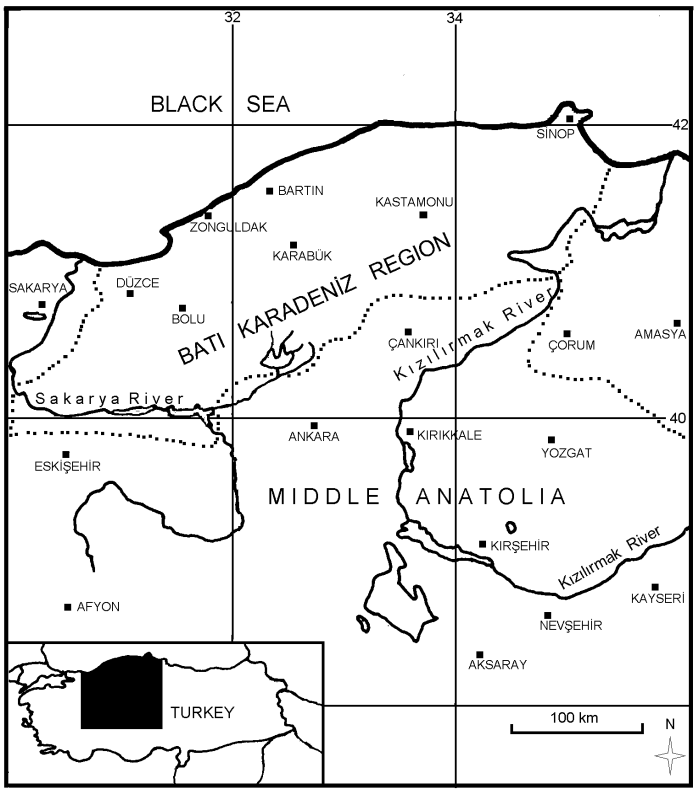


Fig 31. Study area: Batı Karadeniz Region.

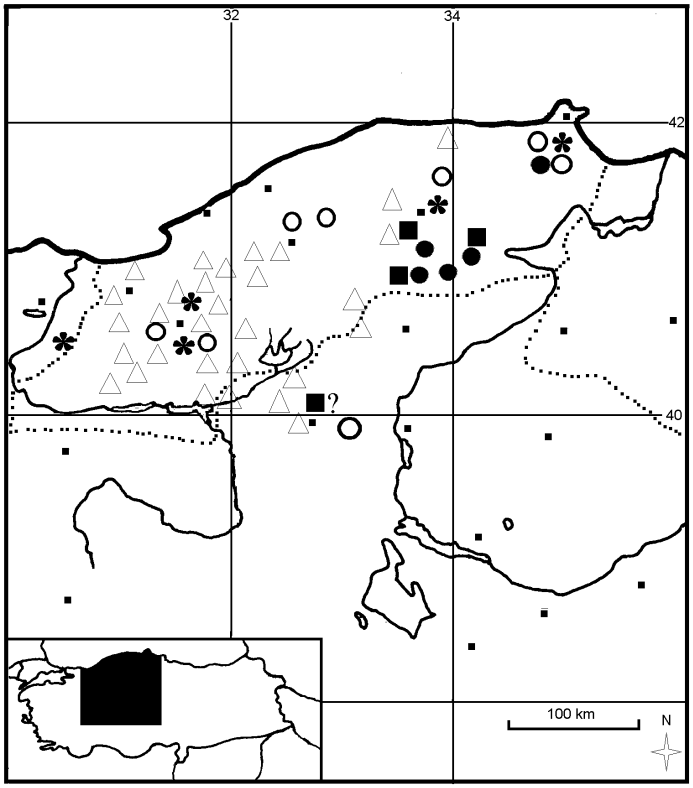


Fig 32. Distribution of 5 *Isophya* species in the study area.
✱ *amplipennis* ○ *pavelii* △ *rectipennis* ● *obenbergeri* ■ *ilkazi*

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use

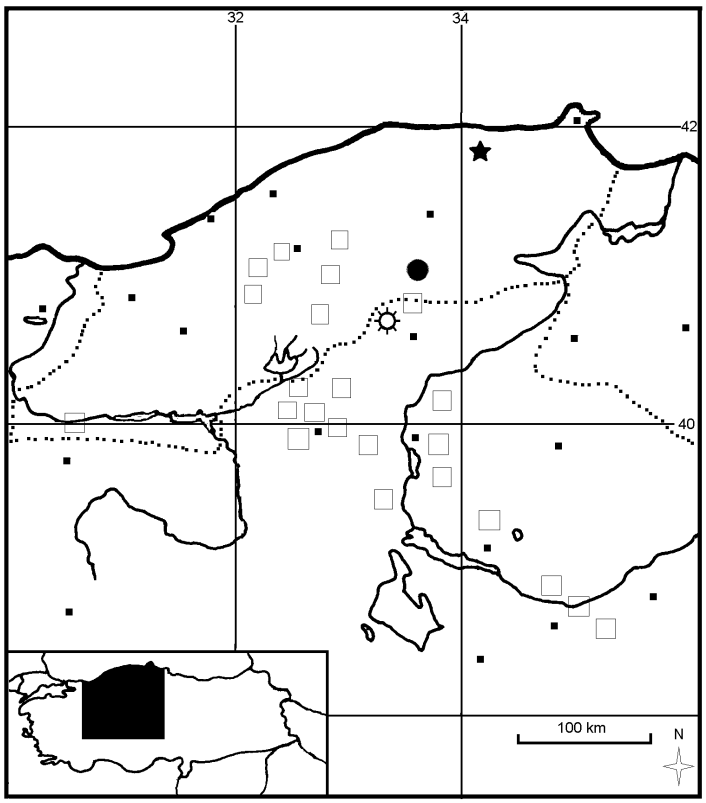


Fig 33. Distribution of 4 *Isophya* species in the study area.
□ *nervosa* ☼ *obtusidens* ★ *yaraligozi sp.n.* ● *staneki*

Downloaded From: https://staging.bioone.org/journals/Journal-of-Orthoptera-Research on 17 Feb 2025
Terms of Use: https://staging.bioone.org/terms-of-use