

Research article

Hesperiidae Latreille, 1809 (Lepidoptera: Hesperioidea) fauna of Lower Kelkit Valley

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Abstract: In this study, 12 species belonging to 7 genera of the Hesperiidae family have been recorded from surrounding Lower Kelkit Valley. All species are new records for the research area. The species *Erynnis tages* (Linnaeus, 1758) was a new record for Tokat province. This species is quite common in Türkiye, but there is no record from Tokat province so far. Moreover, in this study, the chorotypes of Hesperiidae species were examined to determine their geographical distribution and origin. It has been determined that the Hesperiidae species distributed in the Lower Kelkit Valley are in 6 different chorotypes.

Keywords: Hesperiidae, Lower Kelkit Valley, Chorotypes, new record

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Introduction

The source of the Kelkit Stream is the Çimen Mountains of Gümüşhane province. Kelkit Stream merges with Yeşilırmak in Kale Village of Tokat's Erbaa district and flows into the Black Sea from Samsun Çarşamba. The valley formed by the Kelkit Stream is one of the important basins of our country (Kılıç, 2010; Aydın, 2014).

The geomorphological and topographic structures of the basin are effective on the climate. Partially Mediterranean climate characteristics are observed, especially in the west of the valley, and this effect decreases towards the east and the continental climate effect increases. As you move towards the northern parts of the valley, the Black Sea climate increases its influence, while as you move towards the southern regions, the continental climate increases its influence. It is possible to see

characteristics of both climates in some parts of the basin. For this reason, the geographical position of Kelkit Valley is important because of its location between Central Anatolia and the Black Sea regions for the dispersal corridor for different faunal elements (Dursun & Fent, 2009).

Approximately 160,000 species belonging to the Lepidoptera Linnaeus, 1758 order have been described in the world and it is estimated that there are around 255,000 Lepidoptera species. The order Lepidoptera is divided into 4 suborders: Glossata Fabricius, 1775, Zeugloptera Chapman, 1916, Aglossata Speidel 1977 and Heterobathmiina Kristensen, 1983. The suborder Glossata constitutes the richest group with 122 families. Butterflies represent approximately 9% of known Lepidoptera species, with 23,500 species. To date, 412 butterfly

species in 9 families have been recorded in Türkiye. (Atay et al., 2016; Koçak & Kemal, 2018).

According to the available literature, in Amasya province 25 species belonging to the HesperIIDae family were recorded throughout the Amasya province, of those, 2 species were recorded in the Taşova district and in the Tokat province 23 species, of those, 4 species in the Niksar district, 6 species in the Erbaa district, 2 species in the Başçiftlik district, 1 species in the Reşadiye district, and 1 species in the Almus district have been recorded so far (Zeller, 1847; Lederer, 1855; Staudinger, 1878; Higgins, 1974; Koçak, 1982; De Jong, 1987; Hesselbarth et al., 1995; Koçak & Çalışkan, 1995; Gülmez, 1996; Avcı, 2002; Koyuncu, 2012).

Until this study, there had been no specific study of the HesperIIDae fauna of the Lower Kelkit Valley. The purpose of this study is to give new records for the HesperIIDae fauna of Lower Kelkit Valley, to available ecological data for the species given, and to open a new way for scientific and ecological studies in the region.

Materials and Methods

Kelkit Valley is important to divide into 3 sub-regions Lower Kelkit Valley, Middle Kelkit Valley, and Upper Kelkit Valley to facilitate the studies to be carried out (Kılıç, 2010). Lower Kelkit Valley lies

within the borders of Amasya and Tokat provinces. Taşova district of Amasya province, Erbaa, Niksar, Başçiftlik, Almus, and Reşadiye districts of Tokat province are the areas within the Lower Kelkit Valley (Kılıç, 2010). This study was carried out within the borders of 6 districts in the Lower Kelkit Valley in 2022-2023, between March and September, when butterflies are active during the day. 41 samples were collected from 15 localities with different habitat characteristics and elevations (220 m – 1920 m) (Table 1; Figure 1).

The specimens were collected on trees, grass, and shrubs using insect nets with a mouth diameter of 50 cm and telescopic handle. Captured specimens were killed by squeezing the thorax area. The killed samples were placed in triangular envelopes and sequence numbers, date, and location information were written on the envelopes. A stretching board, number 2 or 3 insect needles, and tracing paper were used to stretch the materials to be stretched on the same day. Canon EOS 70D camera, Canon EF 100mm f/2.8L Macro IS USM Lens, a tripod, computer, appropriate software (Microsoft Excel, Adobe Photoshop, Canon EOS Utility), ring flash, eva for soft background paper, needle clamp, and external flashes were used to photograph the stretched and dried materials.

Table 1. Provinces and districts where the detected species are found

Familiya	Cins	Tür	Amasya	Taşova	Tokat	Niksar	Almus	Başçiftlik	Reşadiye	Erbaa
HesperIIDae	<i>Carcharodus</i>	<i>alceae</i>			+	+				+
HesperIIDae	<i>Carcharodus</i>	<i>lavatherae</i>			+		+			
HesperIIDae	<i>Carcharodus</i>	<i>orientalis</i>			+		+			
HesperIIDae	<i>Erynnis</i>	<i>tages</i>			+				+	+
HesperIIDae	<i>Muschampia</i>	<i>tessellum</i>			+					+
HesperIIDae	<i>Ochlodes</i>	<i>venatus</i>	+	+	+					+
HesperIIDae	<i>Pyrgus</i>	<i>cinarae</i>			+		+			
HesperIIDae	<i>Pyrgus</i>	<i>melotis</i>			+					+
HesperIIDae	<i>Pyrgus</i>	<i>sidae</i>			+					+
HesperIIDae	<i>Spialia</i>	<i>orbifer</i>			+					+
HesperIIDae	<i>Thymelicus</i>	<i>lineolus</i>			+		+			+
HesperIIDae	<i>Thymelicus</i>	<i>sylvestris</i>	+	+	+		+			+

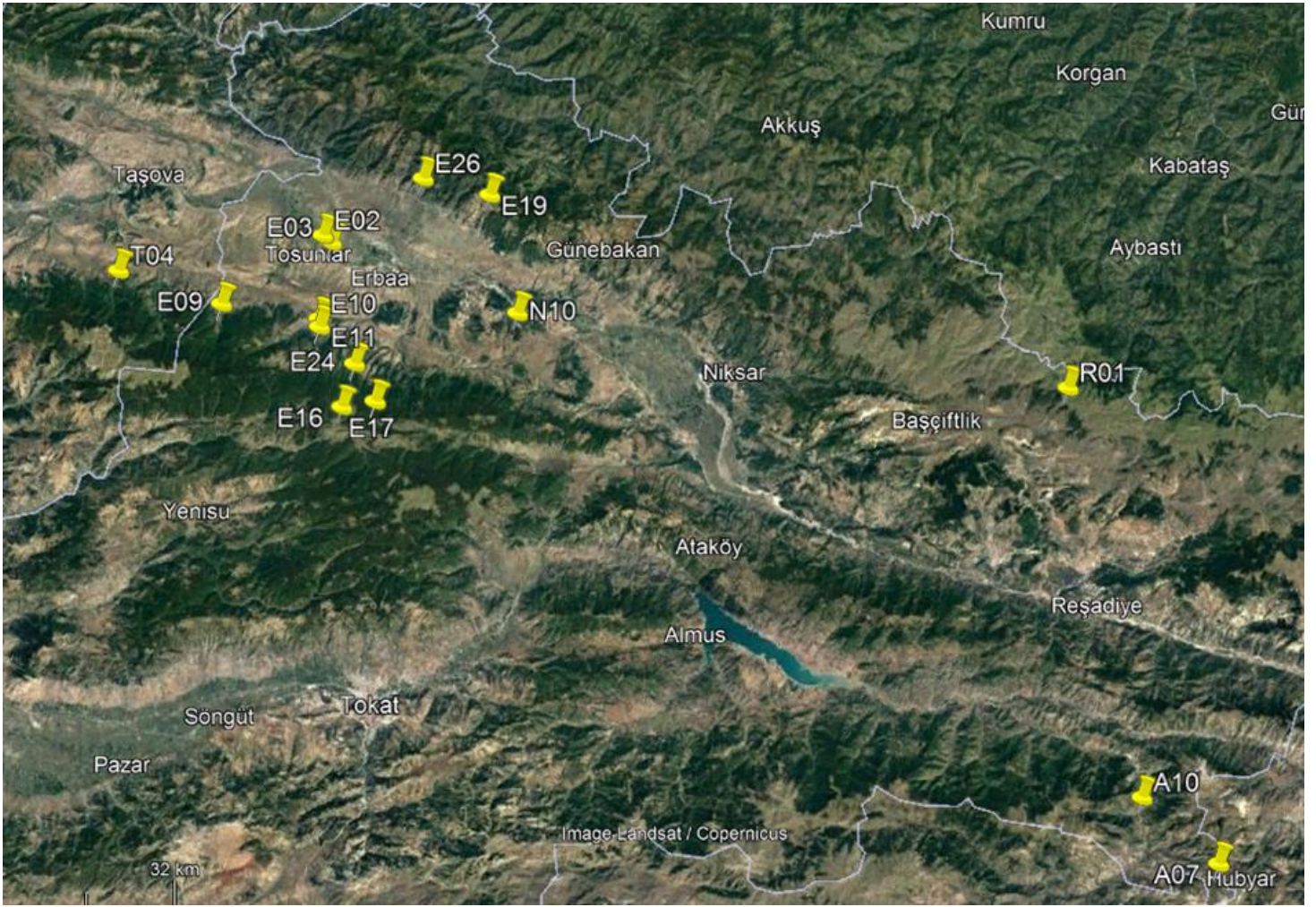


Figure 1. The area of study in Lower Kelkit Valley (from google earth)

The specimens were investigated under a stereomicroscope (Leica EZ4) and keys of Higgins & Riley (1973), Thomas (1989), Hesselbarth et al. (1995), Koçak & Kemal (2018), Raymond & Gibbons (2022) and Trakel (2023). Chorotypes of HesperIIDae species were given according to Vigna Taglianti et al. (1999). The material is deposited in the collection of Amasya University, Faculty of Science and Arts, Department of Biology (Amasya, Türkiye).

Results

Ordo: Lepidoptera Linnaeus, 1758

Superfamily: Hesperioidea Latreille, 1809

Family: HesperIIDae Latreille, 1809

Genus: *Carcharodus* Hübner, [1819]

Carcharodus alceae (Esper, 1780)

Material examined: Tokat: Erbaa: Evyaba (Pürlü Tepe), 10.IV.2022, 1 ♂; 28.IV.2022, 2 ♂ ♂; Güveçli, 03.

VIII.2022, 1 ♀; Niksar: Gökçeli (Boğama Çamlığı), 10.VIII.2022, 1 ♂.

Chorotype: Palearctic.

Distribution in Palearctic Region. Europe: Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Netherlands, North Macedonia, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland, Türkiye (European Part), Ukraine. **Asia:** Afghanistan, Armenia, Azerbaijan, China, Cyprus, Georgia, Iran, Iraq, Israel, Kazakhstan, Lebanon, Russia, Turkmenistan, Türkiye, Yemen. **North Africa:** Algeria, Morocco, Tunisia. Extralimital: Pakistan (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Ağrı, Amasya, Ankara, Antalya,

Ardahan, Artvin, Aydın, Balıkesir, Bartın, Batman, Bingöl, Bitlis, Burdur, Bursa, Çanakkale, Denizli, Diyarbakır, Elazığ, Erzincan, Erzurum, Eskişehir, Gaziantep, Gümüşhane, İstanbul, İzmir, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karabük, Karaman, Kars, Kayseri, Kütahya, Kırıkkale, Kırklareli, Kilis, Kocaeli, Konya, Malatya, Manisa, Mardin, Mersin, Muğla, Muş, Nevşehir, Niğde, Osmaniye, Rize, Siirt, Sivas, Şanlıurfa, Şırnak, Tokat, Tunceli, Van, Yozgat, Zonguldak (Lederer, 1855; Staudinger, 1878; Fontaine, 1904; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

***Carcharodus lavatherae* (Esper, 1783)**

Material examined: Tokat: **Almus:** Hubyar-Tekeli, 05.VII.2022, 1 ♀.

Chorotype: West Palearctic.

Distribution in Palearctic Region. Europe: Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, France, Germany, Greece, Hungary, Italy, North Macedonia, Romania, Slovakia, Slovenia, Spain, Switzerland, Türkiye (European Part), Ukraine. **Asia:** Iran, Russia, Türkiye. North Africa: Algeria, Morocco, Tunisia (Seven & Yıldız, 2018).

Distribution in Türkiye: Adana, Afyonkarahisar, Ağrı, Aksaray, Amasya, Ankara, Antalya, Ardahan, Artvin, Bartın, Batman, Bingöl, Bitlis, Bolu, Çanakkale, Çankırı, Çorum, Diyarbakır, Elazığ, Erzincan, Erzurum, Gümüşhane, Hakkari, Iğdır, Isparta, Kahramanmaraş, Karabük, Karaman, Kars, Kastamonu, Kayseri, Kırklareli, Kırşehir, Kocaeli, Konya, Malatya, Mersin, Muş, Nevşehir, Niğde, Siirt, Sivas, Şırnak, Tokat, Tunceli, Van, Yozgat (Lederer, 1855; Staudinger, 1878; Hesselbarth et al., 1995; Gülmez, 1996; Koyuncu, 2012; Koçak & Kemal, 2018; Seven & Yıldız, 2018).

***Carcharodus orientalis* Reverdin, 1913**

Material examined: Tokat: **Almus:** Hubyar-Tekeli, 05.VII.2022, 2 ♂♂.

Chorotype: Centralasiatic-Europeo-Mediterranean.

Distribution in Palearctic Region. Europe: Albania, Belarus, Bulgaria, Croatia, Greece, North Macedonia, Türkiye (European Part), Ukraine. **Asia:**

Iran, Iraq, Israel, Jordan, Lebanon, Russia, Türkiye (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Amasya, Ankara, Antalya, Artvin, Balıkesir, Bartın, Batman, Bayburt, Bitlis, Bolu, Bursa, Çanakkale, Çankırı, Çorum, Denizli, Diyarbakır, Elazığ, Erzincan, Erzurum, Gaziantep, Gümüşhane, İstanbul, İzmir, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karaman, Kars, Kayseri, Kütahya, Kırklareli, Konya, Malatya, Mardin, Mersin, Muğla, Muş, Nevşehir, Niğde, Siirt, Sivas, Şanlıurfa, Şırnak, Tokat, Tunceli, Van, Yozgat (Staudinger, 1878; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

Genus: *Erynnis* Schrank, 1801

***Erynnis tages* (Linnaeus, 1758)**

Material examined: Tokat: **Erbaa:** Karayaka, 01.VI.2022, 1 ♀; Koçak (Dineğin Dere), 01.VI.2022, 2 ♂♂; Güveçli, 03.VIII.2022, 1 ♂ 1 ♀; Reşadiye: Bozçalı, 12.VIII.2023, 1 ♂.

Chorotype: Asiatic-European.

Distribution in Palearctic Region. Europe: Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye (European Part), Ukraine, United Kingdom. **Asia:** China, Iran, Iraq, Kazakhstan, Lebanon, Mongolia, Russia, Türkiye (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Afyonkarahisar, Amasya, Ankara, Antalya, Ardahan, Artvin, Bayburt, Bilecik, Bingöl, Bitlis, Bolu, Bursa, Çanakkale, Çankırı, Diyarbakır, Edirne, Elazığ, Erzincan, Erzurum, Eskişehir, Gaziantep, Gümüşhane, Giresun, İstanbul, İzmir, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karabük, Karaman, Kars, Kastamonu, Kayseri, Kırıkkale, Kırklareli, Kocaeli, Konya, Malatya, Manisa, Mersin, Muş, Nevşehir, Niğde, Ordu, Sakarya, Siirt, Sivas, Şanlıurfa, Şırnak, Tekirdağ, Tunceli, Van, Yozgat, Zonguldak (Staudinger, 1878; Hesselbarth et al., 1995; Koçak & Kemal, 2018).

Genus: *Muschampia* Tutt, 1906

***Muschampia tessellum* (Hübner, 1802)**

Material examined: Tokat: Erbaa: Koçak (Dineğin Dere), 01.VI.2022, 1 ♂; Hacıali, 23.VI.2022, 1 ♂; Sokutaş (Süleymançeşme), 23.VI.2022, 1 ♂.

Chorotype: Asiatic-European.

Distribution in Palaearctic Region. Europe:

Albania, Belarus, Greece, North Macedonia, Ukraine. Asia: Azerbaijan, Celestial Mountains, China, Georgia, Iran, Israel, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Türkiye (Koçak & Kemal, 2018).

Distribution in Türkiye: Afyonkarahisar, Ankara, Ardahan, Artvin, Bayburt, Bingöl, Bolu, Bursa, Düzce, Diyarbakır, Erzincan, Erzurum, Gümüşhane, İstanbul, Iğdır, Kahramanmaraş, Karabük, Kars, Kütahya, Muğla, Siirt, Tokat, Zonguldak (Lederer, 1855; Staudinger, 1878; Fontaine, 1904; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

Genus: *Ochlodes* Scudder, 1872

***Ochlodes venata* (Bremer & Grey, 1853)**

Material examined: Amasya: Taşova: Tatlıpınar, 22.VI.2022, 1 ♀; **Tokat: Erbaa:** Hacıali, 23.VI.2022, 1 ♀; Zoğallıçukur, 16.VII.2023, 1 ♂.

Chorotype: Asiatic-European.

Distribution in Palaearctic Region. Europe:

Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom. Asia: Celestial Mountains, China, Iran, Iraq, Kazakhstan, Kyrgyzstan, Lebanon, Russia, Syria, Türkiye (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Amasya, Ankara, Antalya, Ardahan, Artvin, Balıkesir, Bartın, Batman, Bayburt, Bilecik, Bitlis, Bolu, Bursa, Çanakkale, Düzce, Erzincan, Erzurum, Eskişehir, Gümüşhane, İstanbul, İzmir, Hakkari, Hatay, Isparta, Kahramanmaraş, Karabük, Kars, Kastamonu, Kütahya, Kırklareli, Kocaeli, Konya, Mersin, Ordu, Rize, Siirt, Sivas,

Şırnak, Tokat, Trabzon, Tunceli, Van, Yozgat (Mann, 1861; Staudinger, 1878; Hesselbarth et al., 1995; Gülmez, 1996; Koyuncu, 2012; Koçak & Kemal, 2018).

Genus: *Pyrgus* Hübner, [1819]

***Pyrgus cinarae* (Rambur, 1839)**

Material examined: Tokat: Almus: Bağtaşı, 13.VII.2023, 1 ♂.

Distribution in Palaearctic Region. Europe:

Albania, Bulgaria, Greece, North Macedonia, Serbia, Spain, Türkiye (European Part), Ukraine. Asia: Russia, Türkiye (Popović et al., 2014; Koçak & Kemal, 2018).

Chorotype: Turano-European.

Distribution in Türkiye: Adana, Afyonkarahisar, Amasya, Ankara, Artvin, Bitlis, Burdur, Bursa, Edirne, Erzurum, Gümüşhane, İzmir, Hakkari, Iğdır, Kars, Kayseri, Kütahya, Konya, Mersin, Rize, Sivas, Tokat, Tunceli, Van (Lederer, 1855; Staudinger, 1878; Hesselbarth et al., 1995; Koçak & Kemal, 2018).

***Pyrgus melotis* (Duponchel, 1834)**

Material examined: Tokat: Erbaa: Koçak (Hapandüzü), 20.V.2022, 1 ♀; Tanoba, 01.VI.2022, 1 ♀; Koçak (Dineğin Dere), 01.VI.2022, 1 ♀.

Chorotype: Turano-European.

Distribution in Palaearctic Region. Europe: Greece.

Asia: Iran, Israel, Jordan, Lebanon, Syria, Türkiye (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Ağrı, Amasya, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bayburt, Bingöl, Bitlis, Bolu, Çankırı, Denizli, Diyarbakır, Elazığ, Erzincan, Erzurum, Gaziantep, Gümüşhane, Giresun, İzmir, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karaman, Kars, Kayseri, Kütahya, Kırıkkale, Konya, Malatya, Mersin, Muğla, Muş, Nevşehir, Niğde, Ordu, Osmaniye, Rize, Siirt, Sivas, Şırnak, Tokat, Trabzon, Van, Yozgat (Lederer, 1855; Staudinger, 1878; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

***Pyrgus sidae* (Esper, 1784)**

Material examined: Tokat: Erbaa: Sokutaş (Süleymançeşme), 23.VI.2022, 3 ♂♂.

Chorotype: Centralasiatic-European.

Distribution in Palaearctic Region. Europe: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, France, Greece, Italy, North Macedonia, Romania, Slovenia, Spain, Türkiye (European Part), Ukraine. **Asia:** Celestial Mountains, Georgia, Iran, Kazakhstan, Kyrgyzstan, Russia, Turkmenistan, Türkiye (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Afyonkarahisar, Ağrı, Amasya, Ankara, Antalya, Ardahan, Artvin, Balıkesir, Bartın, Batman, Bayburt, Bingöl, Bitlis, Bolu, Bursa, Çanakkale, Çankırı, Düzce, Denizli, Diyarbakır, Elazığ, Erzincan, Erzurum, Gümüşhane, Giresun, İstanbul, İzmir, Hakkari, Iğdır, Isparta, Kahramanmaraş, Kars, Kayseri, Kırıkkale, Kırklareli, Kocaeli, Konya, Mersin, Muş, Nevşehir, Niğde, Rize, Siirt, Sivas, Şırnak, Tekirdağ, Tokat, Trabzon, Tunceli, Van, Yozgat (Lederer, 1855; Staudinger, 1878; Fountaine, 1904; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

Genus: *Spialia* Swinhoe, 1912

***Spialia orbifer* (Hübner, 1823)**

Material examined: Tokat: Erbaa: Sokutaş (Süleymançeşme), 23.VI.2022, 1 ♂.

Chorotype: Centralasiatic-European.

Distribution in Palaearctic Region. Europe: Albania, Belarus, Bulgaria, Croatia, Greece, Hungary, North Macedonia, Romania, Slovakia, Slovenia, Türkiye (European Part), Ukraine. **Asia:** Afghanistan, Armenia, Celestial Mountains, China, Iran, Iraq, Israel, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Russia, Türkiye. Extralimital: Pakistan (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Ağrı, Aksaray, Amasya, Ankara, Antalya, Ardahan, Artvin, Aydın, Balıkesir, Bartın, Batman, Bayburt, Bilecik, Bingöl, Bitlis, Bolu, Burdur, Bursa, Çanakkale, Çankırı, Çorum, Denizli, Diyarbakır, Elazığ, Erzincan, Erzurum, Gaziantep, Gümüşhane, Giresun, İstanbul, İzmir, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karaman, Kars, Kastamonu, Kayseri, Kütahya, Kırıkkale,

Kırklareli, Kırşehir, Konya, Malatya, Manisa, Mardin, Mersin, Muğla, Muş, Nevşehir, Niğde, Ordu, Osmaniye, Rize, Sakarya, Samsun, Siirt, Sivas, Şanlıurfa, Şırnak, Tekirdağ, Tokat, Trabzon, Tunceli, Uşak, Van, Yalova, Yozgat (Lederer, 1855; Staudinger, 1878; Fountaine, 1904; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

Genus: *Thymelicus* Hübner, 1819

***Thymelicus lineolus* (Ochsenheimer, 1808)**

Material examined: Tokat: Almus: Hubyar-Tekeli: 05.VII.2022, 2 ♂♂; Erbaa: Sokutaş (Süleymançeşme): 23.VI.2022, 1 ♂. **Chorotype:** West Palearctic.

Distribution in Palaearctic Region. Europe: Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye (European Part), Ukraine, United Kingdom. **Asia:** Afghanistan, Azerbaijan, Celestial Mountains, China, Georgia, Iran, Israel, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Russia, Turkmenistan, Türkiye. **North Africa:** Algeria, Morocco, Tunisia (Koçak & Kemal, 2018).

Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Ağrı, Amasya, Ankara, Antalya, Ardahan, Artvin, Balıkesir, Bartın, Bayburt, Bingöl, Bitlis, Bolu, Burdur, Bursa, Çankırı, Çorum, Denizli, Diyarbakır, Edirne, Elazığ, Erzincan, Erzurum, Eskişehir, Gaziantep, Gümüşhane, İstanbul, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karabük, Karaman, Kars, Kayseri, Kütahya, Kırıkkale, Kırklareli, Kırşehir, Konya, Malatya, Mardin, Mersin, Muğla, Muş, Nevşehir, Niğde, Osmaniye, Siirt, Sivas, Şanlıurfa, Şırnak, Tokat, Tunceli, Van, Yozgat (Lederer, 1855; Staudinger, 1878; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

***Thymelicus sylvestris* (Poda, 1761)**

Material examined: Amasya: Taşova: Tatlıpınar, 22.VI.2022, 3 ♂♂; Tokat: Almus: Bağtaşı, 13.VII.2023, 2 ♂♂; Hubyar-Tekeli, 13.VII.2023, 1 ♂;

Erbaa: Evyaba, 08.VI.2022, 1♂; Sokutaş (Süleymançeşme), 23.VI.2022, 1♂ 1♀.

Chorotype: Turano-Europea-Mediterranean.

Distribution in Palaearctic Region. Europe: Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, North Macedonia, Poland, Portugal, Romania, Slovakia, Spain, Switzerland, Türkiye (European Part), Ukraine, United Kingdom. **Asia:** Armenia, Azerbaijan, Georgia, Iran, Iraq, Jordan, Lebanon, Russia, Syria, Türkiye. **North Africa:** Algeria, Morocco (Khramov, 2023; Koçak & Kemal, 2018).

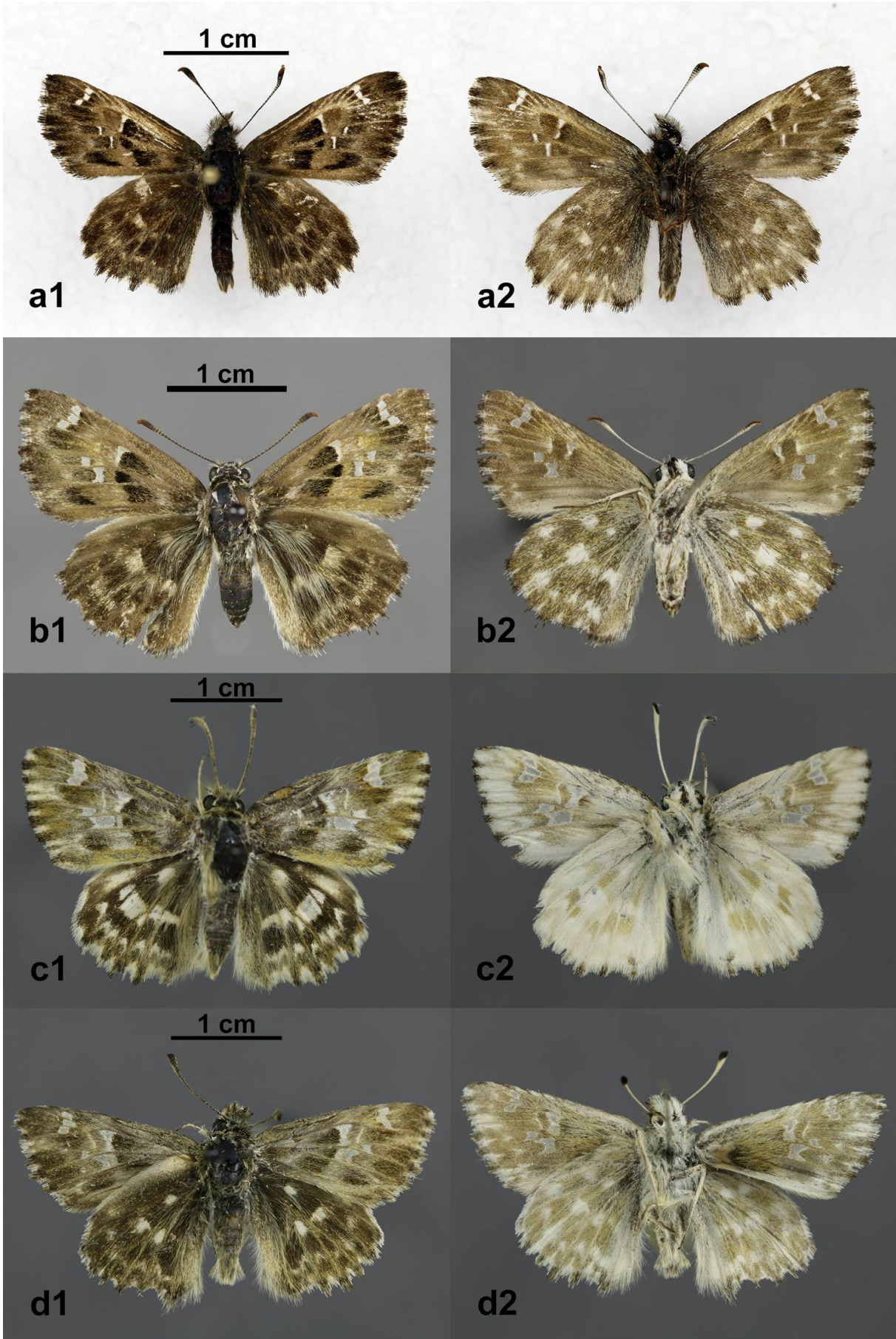
Distribution in Türkiye: Adana, Adıyaman, Afyonkarahisar, Ağrı, Amasya, Ankara, Antalya, Ardahan, Artvin, Balıkesir, Bartın, Batman, Bayburt, Bilecik, Bingöl, Bitlis, Bolu, Burdur, Bursa, Çanakkale, Çankırı, Çorum, Düzce, Denizli, Diyarbakır, Edirne, Elazığ, Erzincan, Erzurum, Eskişehir, Gaziantep, Gümüşhane, Giresun, İstanbul, İzmir, Hakkari, Hatay, Iğdır, Isparta, Kahramanmaraş, Karabük, Karaman, Kars, Kastamonu, Kayseri, Kütahya, Kırıkkale, Kırklareli, Kırşehir, Konya, Malatya, Manisa, Mardin, Mersin, Muğla, Muş, Nevşehir, Niğde, Siirt, Sivas, Şanlıurfa, Şırnak, Tokat, Trabzon, Tunceli, Uşak, Van, Yozgat, Zonguldak (Lederer, 1855; Staudinger, 1878; Hesselbarth et al., 1995; Gülmez, 1996; Koçak & Kemal, 2018).

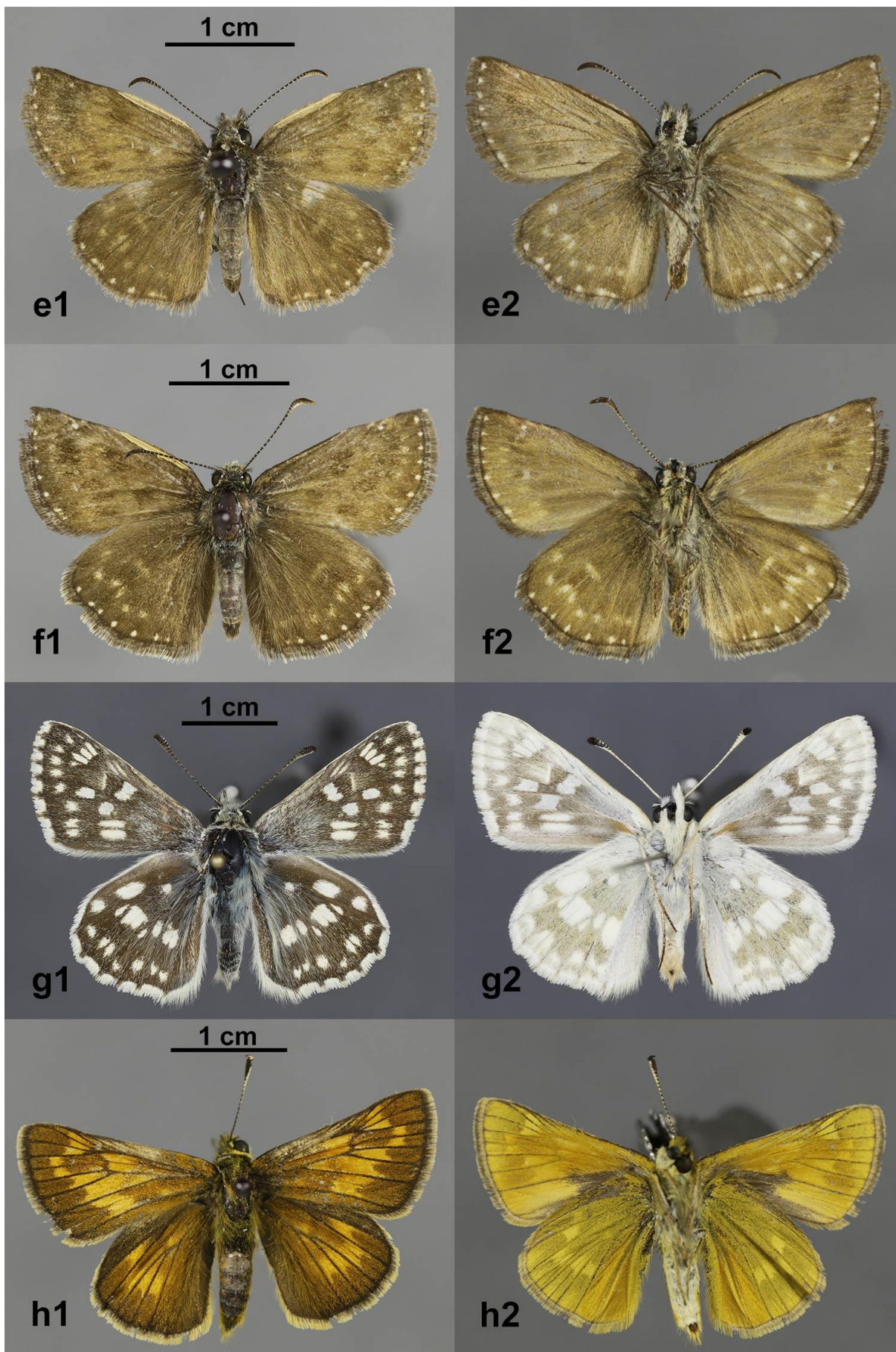
Discussion

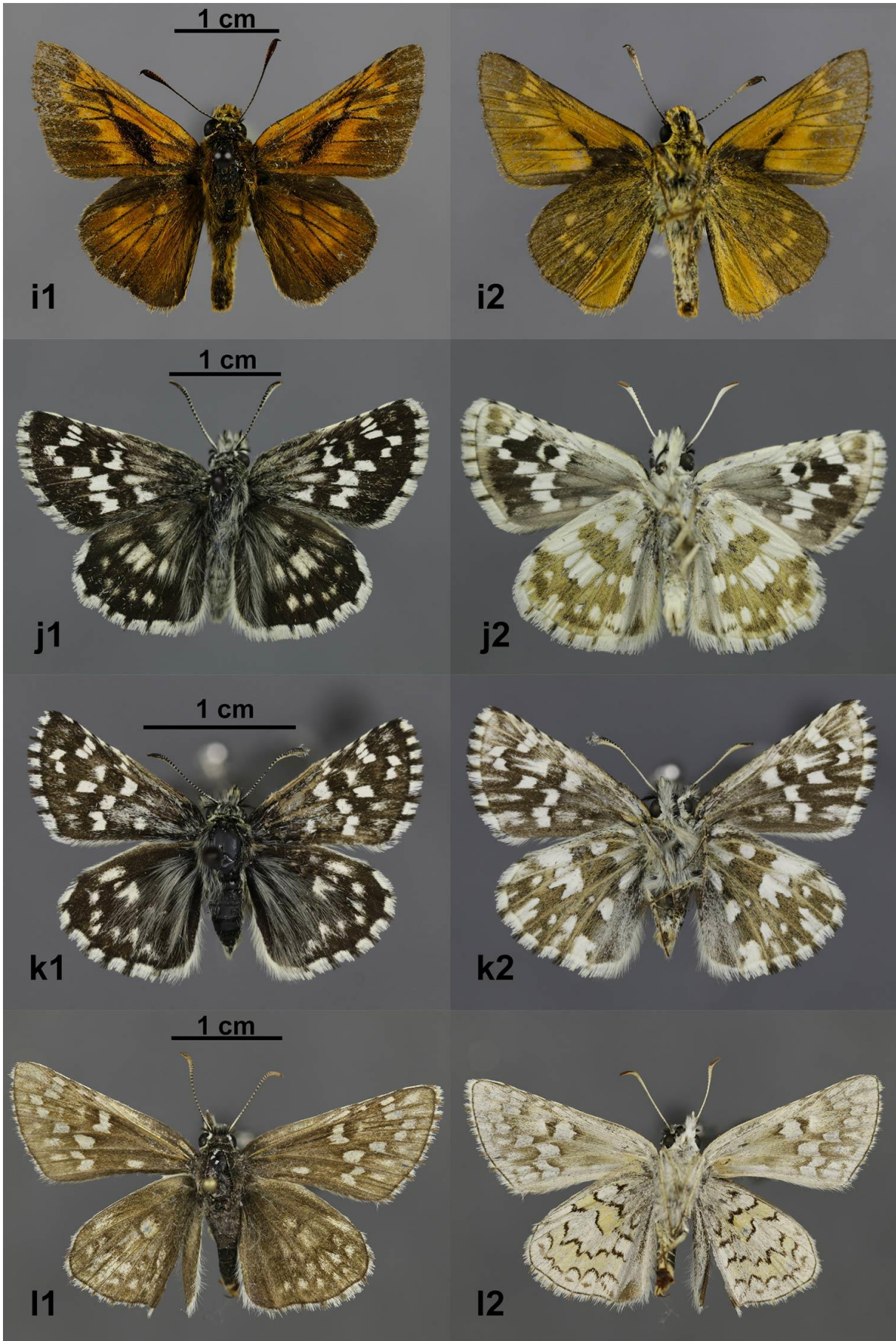
In this study, the recognition of the specimens collected from 15 different localities in Lower Kelkit Valley revealed 12 species belonging to 7 genera of the Hesperiiidae family (Figure 2). All of the species identified are new records for the Lower Kelkit Valley, which is the research area. In addition, it was determined that the *Erynnis tages* (Linnaeus, 1758), one of the identified species, was a new record for Tokat province (Figure 2 e-f). It is known that this species is quite common in Anatolia and Thrace, but there is no record from Tokat province so far. Among the identified species, *Carcharodus lavatherae*,

Carcharodus orientalis, *Pyrgus cinarae*, *Pyrgus sidae* and *Spialia orbifer* taxa were determined to be very rare in the research area, although they are widely distributed in our country. It is seen that the taxon *Carcharodus lavatherae*, one of the species identified in the research area, is an NT (Near Threatened) species on the List Category (Europe) IUCN (van Swaay et al., 2010). The fact that a single specimen of this species was caught in the research area and was not seen in any other locality during field studies shows that the population density of this species is very low. Species other than the *Carcharodus lavatherae* appear to be LC (Least Concern) in the List Category (Europe) IUCN (van Swaay et al., 2010). Vigna Taglianti et al. (1999) reported that information about the place of origin of faunal elements and the geographical distribution of plants and animals can be obtained through chorotype studies. Therefore, chorotype studies can provide a useful tool for biogeographical research in a region. In this study, the chorotypes of Hesperiiidae species were examined to determine their geographical distribution and origin. When the chorotypes of the Hesperiiidae species we identified in the research area were examined; It seems that the *Carcharodus alceae* (Palearctic chorotype) is the species with the widest distribution. It is seen that the chorotypes of *Carcharodus lavatherae* and *Thymelicus lineolus* are West Palearctic, while *Erynnis tages*, *Muschampia tessellum* and *Ochlodes venata* are Asiatic-European chorotypes. *Spialia orbifer* and *Pyrgus sidae* are with Central Asian-European chorotype.

Pyrgus melotis and *Pyrgus cinarae* appear to be species in the Turano-European chorotypes. *Carcharodus orientalis* is a species in the Centralasiatic-European-Mediterranean chorotype and *Thymelicus sylvestris* is a species in the Turano-European-Mediterranean chorotype. The presence of Hesperiiidae species in different chorotypes can be explained by the fact that the Kelkit Valley is rich in flora and microclimate and is on a transition route between the Black Sea, Eastern Anatolia, and Central Anatolia regions. The valley also allows the east-west distribution of fauna elements that entered our country from the Caucasus and Thrace (Dursun & Fent, 2009).







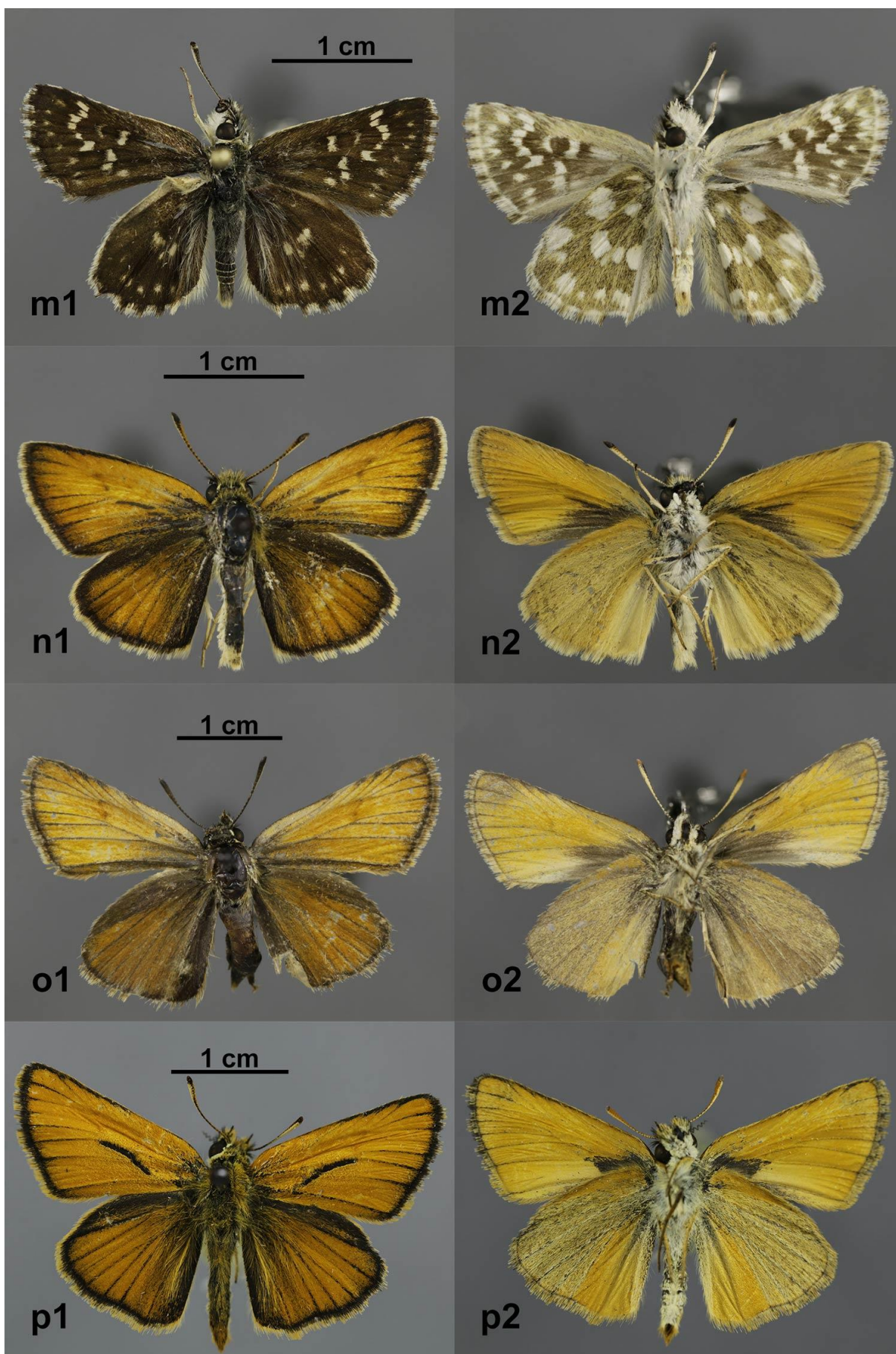


Figure 2. a1) *Carcharodus alceae* (♂-Dorsal), a2) *Carcharodus alceae* (♂-Ventral), b1) *Carcharodus alceae* (♀-Dorsal), b2) *Carcharodus alceae* (♀-Ventral), c1) *Carcharodus lavatherae* (♀-Dorsal), c2) *Carcharodus lavatherae* (♀-Ventral), d1) *Carcharodus orientalis* (♂-Dorsal), d2) *Carcharodus orientalis* (♂-Ventral), e1) *Erynnis tages* (♂-Dorsal), e2) *Erynnis tages* (♂-Ventral), f1) *Erynnis tages* (♂-Dorsal), f2) *Erynnis tages* (♂-Ventral), g1) *Muschampia tessellum* (♂-dorsal), g2) *Muschampia tessellum* (♂-ventral), h1) *Ochlodes venatus* (♀-dorsal), h2) *Ochlodes venatus* (♀-ventral), i1) *Ochlodes venatus* (♂-dorsal), i2) *Ochlodes venatus* (♂-ventral), j1) *Pyrgus cinarae* (♂-dorsal), j2) *Pyrgus cinarae* (♂-ventral), k1) *Pyrgus melotis* (♀-dorsal), k2) *Pyrgus melotis* (♀-ventral), l1) *Pyrgus sidae* (♂-dorsal), l2) *Pyrgus sidae* (♂-ventral), m1) *Spialia orbifer* (♂-dorsal), m2) *Spialia orbifer* (♂-ventral), n1) *Thymelicus lineolus* (♂-dorsal), n2) *Thymelicus lineolus* (♂-ventral), o1) *Thymelicus sylvestris* (♀-dorsal), o2) *Thymelicus sylvestris* (♀-ventral), p1) *Thymelicus sylvestris* (♂-dorsal), p2) *Thymelicus sylvestris* (♂-ventral).

It is important to protect habitats through studies to protect biodiversity. Events such as chemical control methods applied especially in agricultural practices, urbanization, and the expansion of the distribution of exotic species as a result of global warming threaten butterfly species as well as other faunal elements.

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Ethical Approval

No need to etichal approve for this study.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Funding Statement

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