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The first record of endangered *Lycaena helle* ([Denis & Schiffermüller], 1775) for Turkey (Lepidoptera: Lycaenidae)

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Abstract

Lycaena helle ([Denis & Schiffermüller],1775), is listed as "endangered" on the European Red List of butterflies. We report the first record of this species from Turkey. The EUNIS habitat information and photographs of the area where adult individuals was collected together with habitus dorsal and ventral photographs of the species were provided. The distribution status and habitat of the species in the Palaearctic region were evaluated.
KEY WORDS: Lepidoptera, Lycaenidae, *Lycaena helle*, new record, Eunis, Turkey.

Primer registro de *Lycaena helle* ([Denis & Schiffermüller], 1775) en peligro de extinción para Turquía (Lepidoptera: Lycaenidae)

Resumen

Lycaena helle ([Denis & Schiffermüller],1775), está en la lista Roja Europea de mariposas en peligro de extinción. Citamos el primer registro de esta especie en Turquía. Se porporciona información y fotografías del hábitat EUNIS del área donde se colectó un individuo adulto, junto con una fotografía de la especie de su habitus dorsal y ventral. Fueron evaluadas la distribución, estatus y hábitat de la especie en la región Paleártica.
PALABRAS CLAVE: Lepidoptera, Lycaenidae, *Lycaena helle*, nuevo registro, Eunis, Turquía.

Introduction

Lycaena helle ([Denis & Schiffermüller], 1775), is a species with the relict Boreo-montane Palaearctic distribution (POPOVIĆ *et al*., 2014; BOZANO, 2004; HABEL *et al*., 2014). It is found in most of Fennoscandia throughout Central and Northern Europe (POPOVIĆ *et al*., 2014). It extends from Siberia to the Ussuri region in Russia Belarus, Estonia, Georgia, Kazakhstan, Lithuania, Ukraine to Mongolia and China in the Far East (TUZOV *et al*., 2000; NEKRUTENKO & TSHIKOLOVETS, 2005; BOZANO & WEIDENHOFFER, 2001; KORB & BOLSHAKOV, 2016). The presence of this species in Serbia and Bulgaria in the Balkan Peninsula is an important zoogeographic record (KOLEV & SHTINKOV, 2015).

This species uses peat and sphagnum swamps, flowering moist meadows, forest edges and openings, creeks and slopes as its habitat (TSHIKOLOVETS, 2011). It is a postglacial relict in Central Europe and lives mostly in the highlands (HABEL *et al*., 2011; MARTIN *et al*., 2014). However, some populations are found in moist low meadows (SKORKA *et al*., 2007). The population of the species in Europe has expanded to places where suitable habitats are found (POPOVIĆ *et al*., 2014).

There was a significant decrease in the populations of *Lycaena helle* in many countries in the last decade (VAN SWAAY & WARREN, 1999; KUDRNA *et al*., 2011). Populations in Western and

Central Europe decreased considerably (by 50 to 80%) in the last century. It is currently considered extinct in Hungary, the Czech Republic, Italy, Latvia, and Slovakia (VAN SWAAY *et al*., 2010a).

L. helle is listed in the European Red Data Book and in the Annexes of the Habitats Directive (VAN HELSDİNGEN *et al*., 1996; VAN SWAAY & WARREN 1999; VAN SWAAY *et al*., 2010a).

The aim of this study is to provide information about and discuss the distribution and habitat of this butterfly species in Turkey, which was recorded for the first time in Turkey.

Materials and Methods

A specimen of *Lycaena helle* species was collected in Posof district of Ardaham province in 17 Juny 2020 (Map 1). The specimen was collected during the TANAP (Trans-Anatolian Pipeline), project monitoring studies. The line transect method was employed in monitoring studies (Fig. 1). The specimen prepared in accordance with the museum methods is preserved in the Zoology Museum of Gazi University (ZMGU, Ankara, Turkey). Photographs of the dorsal and ventral wing of the specimen were taken with a Canon camera EOS 50D (Fig. 2).

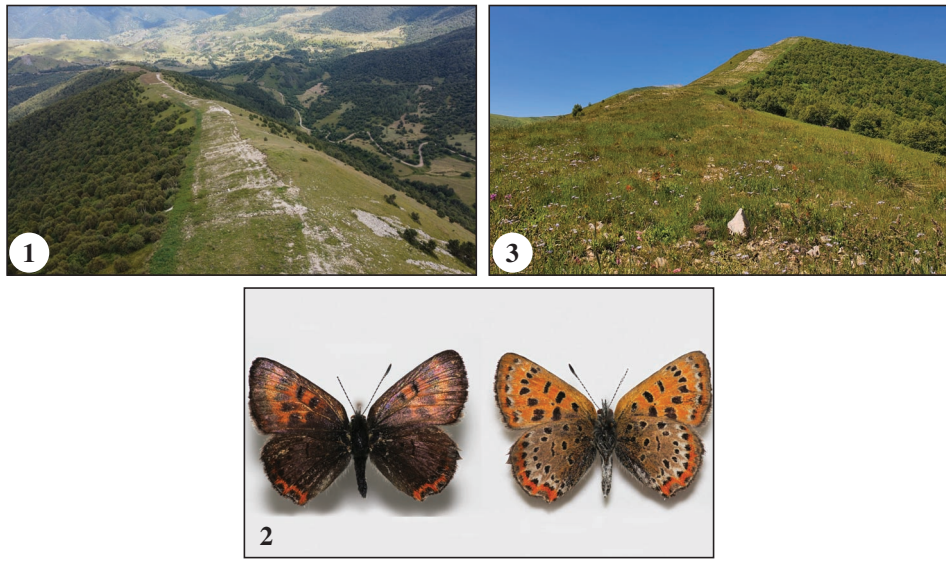
Map 1.– The location of the specimen of *L. helle* ([D. & Schiff.]) collected in Turkey (red pin).

Result and discussion

Within the scope of the Trans-Anatolian Pipeline (TANAP), which is being carried out in Turkey, fauna monitoring studies were carried out along the line. Critical butterfly species were identified, and the EUNIS types of habitats where they spread were determined according to DAVIES *et al*. (2004). The habitat where the species was caught is the "Calcareous alpine and subalpine grassland", located between 2100-2400 m (Fig. 3). The EUNIS habitat code of this habitat is "E4.4". This habitat is suitable for *L. helle*, and it is usual for the species to survive in this habitat. The larvae feed from *Polygonum amphibium* L., *P. bistorta* L., *P. viviparum* (L.) Ronse Decr., *Rumex acetosa* L., *R. acetosella* L., *R. aquaticus* (Trautv.) Hiitonen (TSHIKOLOVETS, 2011). Records of the larval food plant of the Lepidoptera (*Polygonum bistorta* L.) were reported in the same habitat near the location where the

species was collected (TANAP, 2014). This plant species is widely found in the high mountain steppe in the Eastern Anatolia region in Turkey. *Polygonum bistorta* ssp. *carneum* (K. Koch) is a mountain element of Blacksea region and spreads out through Middle and Eastern Blacksea sections, Erzurum-Kars section and Hakkari section (GÜNER, 2012). The fact that the larval food plant is widespread indicates that the necessary conditions exist for *L. helle* to settle and reproduce in the area.

Lycaena helle, which was identified in the monitoring studies carried out in the province of Ardahan in 2020, is the new record for Turkey. This is an important zoogeographic discovery regarding



Figures 1-3.– 1. Aerial photograph of the habitat where the samples were collected. **2.** Habitus of *Lycaena helle* ([D. & Schiff.]). **3.** Acid alpine and subalpine grassland (E4.4) habitat.

the spread of this species. The closest record of the species to Turkey is known as Georgia (Abkhazeti) (DIDMANIDZE, 2004). The available data in Europe show that the very limited habitat base of the species has been deteriorating at an alarming rate over the past two decades. New records of *L. helle* shift the known area of the species in Europe further to the south, which make them very important (POPOVIĆ *et al*., 2014). The identification of the species in Turkey supports that the current distribution area is shifting towards the south.

The reason why only one individual belonging to *L. helle* was caught in this study is that it is a monitoring study carried out along the pipeline, which is a limited area. It is necessary to urgently carry out comprehensive studies in the field to determine the distribution area of the species and the population density. Otherwise, the only known population of the violet copper in Turkey may be on the verge of extinction, as in Europe, without being included in the scope of conservation studies due to insufficient data.

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