

# Description of a new subspecies of *Anthocharis gruneri* HERRICH-SCHÄFFER, [1851], *Anthocharis gruneri zamanii* ssp. n., from the Southeast of Iran, Kerman (Lepidoptera, Pieridae)

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**Abstract:** A new subspecies of *Anthocharis gruneri* HERRICH-SCHÄFFER, [1851] is described here: *A. gruneri zamanii* ssp. n. It is differentiated from other related described taxa by very regular and much denser green and white marking of hindwing underside, bigger and irregular discal spot and more concaved outer margin of orange apex in male. The female is still unknown.

**Beschreibung einer neuen Unterart von *Anthocharis gruneri* HERRICH-SCHÄFFER, [1851] aus dem Südostiran, Kerman: *A. gruneri zamanii* ssp. n.**

**Zusammenfassung:** Eine neue Unterart von *Anthocharis gruneri* HERRICH-SCHÄFFER, [1851] wird beschrieben: *A. gruneri zamanii* ssp. n. Sie unterscheidet sich von verwandten Unterarten durch die regelmäßige und kräftiger grün und weiß gefärbte Unterseitenzeichnung der Hinterflügel sowie durch den größeren und weniger regelmäßigen Diskoidal-fleck und stärker konkaven Außenrand des orangen Apex bei den Männchen. Das Weibchen ist noch unbekannt.

توصیف زیر گونه جدیدی از *Anthocharis gruneri* HERRICH-SCHÄFFER, [1851] با نام *A. gruneri zamanii* ssp. n. از جنوب شرق ایران

در اینجا زیر گونه جدیدی از پروانه *Anthocharis gruneri* HERRICH-SCHÄFFER, [1851] با نام *A. gruneri zamanii* nova ssp. توصیف می شود. این زیر گونه جدید که توسط نویسنده اول مقاله در دامنه های غربی کوه لاله زار در کرمان کشف شده است با مشخصات زیر از سایر زیرگونه های موجود قابل تشخیص است: جنس نر: روی بال به رنگ سفید و نارنجی چرک، الگوی سبز و سفید پشت بال عقب متراکم ولی منظم، خال حجره بال جلو در نر درشت و نسبتاً عمودی و لبه خارجی حاشیه نارنجی به سمت داخل دارای گودرفتگی شده است. جنس ماده هنوز جمع آوری و شناخته نشده است. این زیر گونه جدید به نام دوست و همکار نویسنده اول به نام آقای علیرضا زمانی عنکبوت شناس معروف ایرانی نامگذاری شده است.

## Introduction

During a research project for finding new localities for some early flying Lepidoptera species the first author discovered a new population of *Anthocharis gruneri* in the western slopes of Lalezar Mountains in Kerman. It differs from the closest relatives further to the North and West sufficiently to describe it here as a new subspecies.

## *Anthocharis gruneri zamanii* ssp. n.

**Holotype** ♂: Kerman, Ghale Asgar, western slopes of Lalezar Mountains, 2900–3000 m, 22.–24. III. 2018, leg Alireza NADERI, coll. NHM of Iran, Tehran (Natural History Museum & Genetic Resources).

**Paratypes** (2 ♂♂): 1 ♂, same data, coll. Werner BACK. 1 ♂, Kerman, Dehaj, 2500 m, 26.–28. III. 2014, leg. et coll. A. R. NADERI.

**Etymology:** The new subspecies is named after Mr. Alireza ZAMANI who is a famous Iranian Arachnologist and a friend of the first author.

## Description

(Figs. 1–4, 13–14, map Fig. 16.)

**Male:** length of the forewing 17.0–17.5 mm (holotype 17.5 mm).

**Upperside: Forewing:** The apex is black in tip with wide dull orange area which is confined by a concave black margin in the discal area. The discal spot is big and totally black with a very weak white dot inside or sometimes without it.

The black basal suffusion is very dark and confined to a circle around the body in all wings.

**Hindwing:** Dusty and relatively dirt-white background. A yellowish tint sometimes appears on the white background.

**Underside; Forewing:** Dark green tip with weak white apical dots which is confined to dusty orange area with curved outer margin with white dusty background.

**Hindwing:** Dark dusty green background with whitish rounded spots with relatively regular arrangement.

The female remains unknown so far.

## Discussion

*Anthocharis gruneri* HERRICH-SCHÄFFER, [1851] has a wide range from the Balkan Peninsula to the Middle East. Its type locality is Amasya in Turkey which is more than 2000 km far from its last known distribution in the South of Iran.

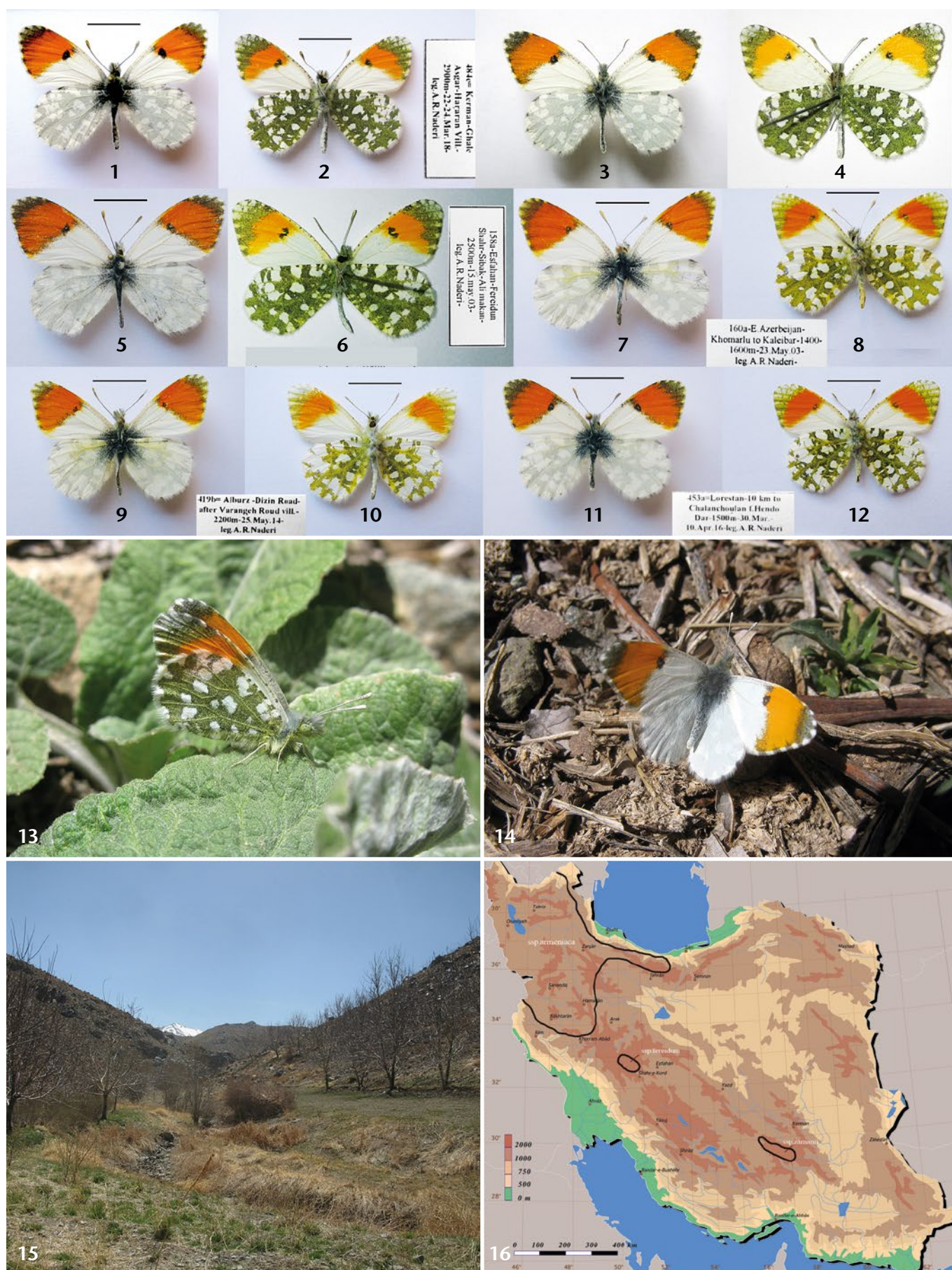
Apparently the new locality appears to be the southernmost distribution of this species in the Palearctic region.

The last described subspecies was *A. g. fereiduni* CARBONELL & BACK, 2009 from the northern part of the central Zagros Mountain range in Iran (Figs. 5–6, map Fig. 16).

As this species prefers semihumid habitats, its range has been divided into many smaller areas after the last glacial period in which ecological factors vary with precipitation. Many of these areas now are disconnected from each other and depending on what time they are separated we can divide them into some groups.

The nominal subspecies flies from Balkan to Turkey. The subspecies *armeniaca* CHRISTOPH, 1893 lives from eastern Turkey to the Caucasus and northern and western Iran (Figs. 7–12, map Fig. 16). The most eastern distribution known for ssp. *armeniaca* is north Lorestan in the Zagros Mountains range.





Figs 1–14: ♂♂ specimens of *Anthocharis gruneri* spp. — Figs. 1–4: *Anthocharis gruneri zamanii* n. ssp. Figs. 1–2: Holotype ♂; upperside (1), underside (2), label (for both specimens). Figs. 3–4: Paratype ♂; upperside (3), underside (4, with pin and shadow). Figs. 5–6: *Anthocharis gruneri fereiduni*. Fig. 5: ♂; upperside (5), underside (6), label. — Figs. 7–12: *Anthocharis gruneri armeniaca*. Figs. 7–8: ♂; E. Azerbaijan; upperside (7), underside (8), label (for both specimens). Figs. 9–10: ♂; Alburz; upperside (9), underside (10), label. Fig. 11–12: ♂; Lorestan; upperside (11), underside (12), label. — Fig. 13–14: *Anthocharis gruneri zamanii*, live ♂ specimen. Not to the same scale. — Fig. 15: Biotope of *Anthocharis gruneri zamanii* in Kerman, Lalezar Mountains. — Fig. 16: Map, distribution of different subspecies of *Anthocharis gruneri* in Iran.

In the eastern part of the central Zagros in a relatively confined area another population flies which is rightly named as a separate subspecies *fereiduni*. This latter is the largest one among the other subspecies and even after further molecular and biological investigation may be able to later arise to the level of species.

Surprisingly between the two latter subspecies in Lorestan province there is no important natural barrier so this matter can possibly correspond to specific rank of the taxon *fereiduni* which needs further studies.

This area seems to be a refugial area for butterfly species after the glacial periods in which many species remained separated from their formerly conspecific relatives at northern latitudes or higher altitudes.

Moving to south the habitats tend to be drier and more isolated. The complete distribution of *A. gruneri* in Zagros is still unknown. But it is predictable to be found in other areas in south Zagros.

*Anthocharis gruneri* is an early flier so its emergence in some localities depends on ecological conditions like precipitation. During the last years, due to lesser precipitation in many parts of Iran, finding them during their flight season is more difficult.

## Ecology

The new taxon was found in a riverside garden at about 2900 m altitude with newly emerged vegetation and a few wild flowers on which it was nectaring on (Fig. 15).

In northern areas the foodplants of *Anthocharis gruneri* are *Aethionema* spp. and *Thlaspi* spp. (both family Brassicaceae), but in Lalezar Mts. none of these plant species could be seen. So its foodplant here is unknown.

At that time, the only accompanying species in this biotope was *Pieris persis* (VERITY, 1922) (Pieridae).

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