Rhopalocera of Turkey. 6. On the geographical variation of *Satyrium ilicis* (Esper) with description of *S. ilicis zabni* n. ssp. from South East Turkey (Lepidoptera: Lycaenidae)

H. van Oorschot & H. van den Brink

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Abstract: The variation of *Satyrium ilicis* (Esper, 1779) is discussed. A new subspecies is described from the southeastern part of Turkey. The subspecies *S. i. caudatula* (Zeller, 1847), *S. i. cilicica* (Holtz, 1897), *S. i. syra* (Pfeiffer, 1932) and *S. i. prinoptas* (Zerny, 1932) are established to be identical with the nominotypical subspecies, and their names are sunk in synonymy of *S. ilicis ilicis* (Esper, [1779]).

Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Plantage Middenlaan 64, 1018 DH Amsterdam.

Introduction

The first results of our study on the geographical variation of *Satyrium ilicis* were presented at the 5th European Congress of Lepidopterology at Budapest, 7-10 April 1986 (Van Oorschot & Van den Brink, in press). Now after 4 years of additional data collection in East Turkey we can further conclude on the status of the subspecies of *S. ilicis*. Because the Budapest lecture has not been published yet we include the relevant findings of that lecture in this article.

Satyrium ilicis (Esper, [1779])

Due to lack of material it was quite acceptable up to the moment at which our systematic investigation in Turkey started to distinguish five subspecies (including the nominotypical) within Turkey:

- *S. i. ilicis* (Esper, [1779]), type locality: Erlangen, Germany
- *S. i. caudatula* (Zeller, 1847), type locality: southwest Turkey; described as a species but considered a subspecies by Zerny (1932), Higgins (1966), and others, not by Koçak (1975, 1989)
- *S. i. cilicica* (Holtz, 1897), type locality: in the province of Içel, South of the Taurus; described as a variety of *ilicis* on the basis of only two specimens
- *S. i. syra* (Pfeiffer, 1932), type locality Kahraman Maras, South East Turkey
- *S. i. prinoptas* (Zerny, 1932), type locality Lebanon

Satyrium ilicis has been recorded presently from more than 180 localities all over Turkey, from sea level up to 2050 m and collected between 12 May and half August. We have studied some 1200 specimens from 165 localities.

It appears that the species displays a significant local as well as geographical variation. We have found a remarkable transition in the morphological characters of the species roughly along the line Kahraman Maras-Elazig-Van (fig. 1). We do not see any reason for separating the populations West and North of that line from the European populations of the subspecies *ilicis*, despite of some variation in morphological characters between different populations. Our investigations showed that the specimens from the Mediterranean area, South of the Taurus mountains, display a slightly richer marking on the underside, in comparison with specimens from Sultanda-

Fig. 1. Distribution of *Satyrium ilicis ilicis* (•), *S. ilicis zabni* (▲) and unidentified records of *S. ilicis* (○) in Turkey. △ indicates localities where both subspecies are found.

glari. The richest underside marking has been found in specimens from the provinces Içel to Hatay and from the northeastern provinces near the Black Sea. Generally underside markings are found to be less pronounced in very dry biotopes. On the North-West side of forementioned transition line, the most remarkable observation was made at the Topuzdagi Geçidi, East Cappadocia, at an elevation of 1500 m, where we found a population of mainly small and dark specimens with hardly recognizable markings on the underside, but also some specimens of the nominotypical subspecies and several transitional forms were observed. Therefore we consider that population to belong to the subspecies *ilicis* as well. The populations of South East Turkey appear to be lighter and less marked on the underside than in the rest of Turkey. We now consider those populations as a new subspecies as discussed below. Preceding the description of the new subspecies we discuss the validity of currently distinguished subspecies of *S. ilicis*.

Satyrium ilicis caudatula (Zeller, 1847)

42 specimens from the province of Mugla, close to the type locality of *caudatula* (type material unknown), cannot be separated from the other material (450 specimens) from the western half of Turkey. The characters, mentioned by Zeller for *caudatula* are displayed in many populations of the nominotypical subspecies. These features are: generally long tail at vein 2 of hind wing, further on underside: (1) white internervular markings on forewing slightly curved (concave outwards), (2) white marking in 2 of hind wing almost straight, with small hook, (3) red marking in 2 of hind wing sickle-shaped (concave outwards), and on the upper side: (4) rust ferruginous spot in female small and vague or absent.

All above led us to the conclusion that *Thecla caudatula* Zeller, 1847 is a junior subjective synonym of *Satyrium ilicis illicis* (Esper, [1779]).

Satyrium ilicis cilicica (Holtz, 1897)

39 specimens from the province of Içel, the type locality of *cilicica* (type material unknown) cannot be separated from the other material (450 specimens) from the western half of Turkey. The main character mentioned by Holz for *cilicica*, a large blue spot in the anal angle on the hind wing underside, is present in many populations of the nominotypical subspecies. We conclude that *Thecla ilicis* Esp. var. *cilicica* Holtz, 1897 is a junior subjective synonym of *Satyrium ilicis ilicis* (Esper, [1779]).

Satyrium ilicis syra (Pfeiffer, 1932)

The type series of *Thecla ilicis* ssp. *syra* Pfeiffer, 1932, in the Zoologische Sammlung des Bayerischen Staates in München consists of 5 males and 4 females, one male and one female bearing a red type label and the rest having red cotype labels; 2 males without a cotype label apparently belong to the type series. In 1986 in Budapest we concluded erroneously, that the type material does not agree with Pfeiffer's description (Van Oorschot & Van den Brink, in press). In fact all type specimens belong to the darker western form, indistinguishable from subspecies *ilicis*. We thought that Pfeiffer described the paler and less marked southeastern form because of the phrase: "Die Tiere sind in ihrer Entwicklung eine Parallelerscheinung zu *acaciae gerhardi*, indem auf der Hfl.-Us. die rotbraunen Saumflecken stark reduciert sind, bei einige 'Mänchen' sogar ganz verschwinden". However Pfeiffer's description is rather vague and could as well be applied to the lighter form in South East Turkey as to the nominotypical subspecies we found near the type locality Kahraman Maras. Bearing in mind that the species displays a rather wide range of local and geographical variation, it becomes easily understandable that due to lack of material from Turkey, Pfeiffer gave a separate name to the material from Kahraman Maras.

Moreover, we felt some uncertainty about Pfeiffer's description in 1986, because we found that Kahraman Maras, the type locality, is situated in the transitional area between the western form (ssp. *ilicis*) and the lighter southeastern form. We found both forms near Kahraman Maras. But after study of the types we must conclude, as already presented in our 1986 lecture, that all type specimens do not exceed the variation range of the subspecies *ilicis* and hence *Thecla ilicis* ssp. *syra* Pfeiffer, 1932 is a junior subjective synonym of *Satyrium ilicis ilicis* (Esper, [1779]).

***Satyrium ilicis prinoptas* (Zerny, 1932)**

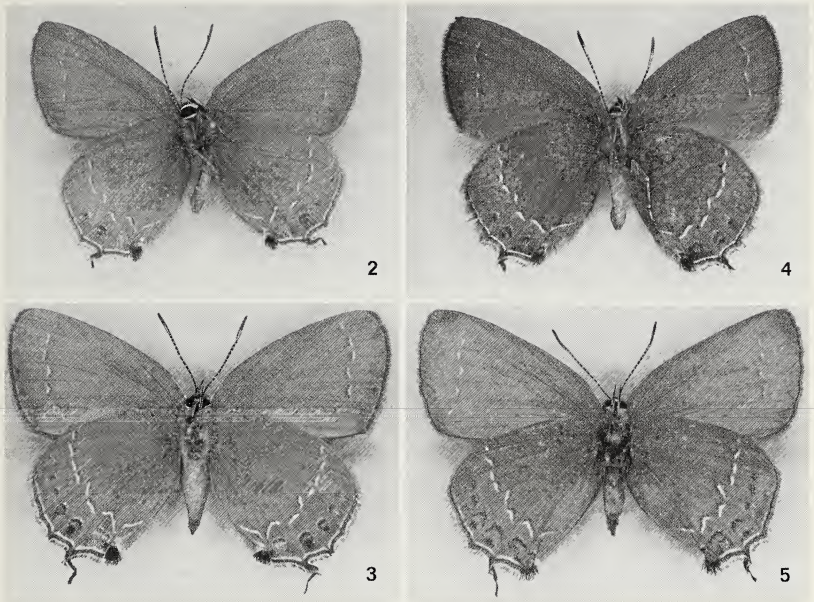
Zerny (1932) described *prinoptas* on the basis of 4 males and 1 female from Becharré, Lebanon. He separated *prinoptas* from the subspecies *caudatula* and *syra*, mainly by the larger reddish yellow submarginal spots on the hind wing underside. We found similar larger reddish yellow spots locally in Turkey, in the provinces of Hatay (close to Syria) and Içel and far to the North East in the provinces of Erzurum and Rize as well. These specimens were collected together with specimens showing more common smaller spots, whilst all intermediates occurred at the same localities or very nearby. Zerny (1932) reported also that, "according to Fountaine, Nicholl and Graves, the subspecies *caudatula* was present in Lebanon", but he assumed these records to refer to *prinoptas*. Other characteristics of *prinoptas*, as mentioned by Zerny, are within the range of variation of the nominotypical subspecies. From these findings we conclude, that *Thecla (Nordmannia) ilicis prinoptas* Zerny, 1932 is a junior subjective synonym of *Satyrium ilicis ilicis* (Esper, [1779]).

***Satyrium ilicis zabni* n. ssp.**
(figs. 2-3)

The lighter *S. ilicis* form of South East Turkey, described here as *zabni* n. ssp., also displays a remarkable local and geographical variation, but despite that there is an abrupt transition on the underside colour and markings between populations of South East Turkey and those of the rest of the country. The southeastern form is characterized by a paler underside in both sexes and reduced submarginal markings, in which the reddish yellow spots are distinctly less reddish, whilst the blue spot in 1b appears relatively large due to almost complete absence of the inward border of reddish yellow scales.

The two forms overlap 25 km only, having been observed in sympatry at two localities: 6 males of *zabni* with 8 males and 8 females of the nominotypical subspecies North East of Kahraman Maras and one female of each form 20 km SW of Bitlis.

This sympatric occurrence in a narrow zone does not allow separation of the southeastern populations at species level. However, the very distinct transition with hardly overlapping



Figs. 2-5. Subspecies of *Satyrium ilicis*, undersides. 2-3, *S. ilicis zabni*, 2, male holotype, 3, female paratype; 4-5, *S. ilicis ilicis*, 4, male, province of Maras, Turkey, 5, female, province of Tunceli, Turkey.

ranges in the variation of the underside colour and markings does give reason to establish for the populations of South East Turkey a new subspecies.

Type material

TURKEY, specimens collected by H. v. Oorschot & H. v. d. Brink: HOLOTYPE: "Turkiye/Hakkari/H. v. Oorschot & H. v. d. Brink/st. 249/35-40 km E. of Uludere/1200-1300 m/13.vi.1985", PARATYPES: 85 ♂♂ and 11 ♀♀, labelling as holotype, 4 ♂♂ and 2 ♀♀, Mardin, 22 km W of Midyat, 1000 m, 8.vi.1984, st. 175, 4 ♂♂, Mardin, 18 km E of Midyat, 900 m, 8.vi.1984, st. 176, 3 ♂♂, Hakkari, Env. Uludere, 1200 m, 9/10.vi.1984, st. 179, 2 ♂♂, Hakkari, 10 km SE of Uludere, 1000 m, 9.vi.1984, st. 180, 8 ♂♂, Siirt, 51 km W of Baykan, 700 m, 4.vi.1985, st. 229, 2 ♀♀, Siirt, 5-7 km S of Siirt, 1000 m, 9.vi.1985, st. 240, 1 ♂ and 1 ♀, Siirt, 3 km E of Eruh, 1000 m, 9.vi.1985, st. 242, 22 ♂♂ and 1 ♀, Hakkari, Env. Uludere, 1200 m, 10.vi.1985, st. 244, 7 ♂♂ and 1 ♀, Hakkari, 5 km E of Uludere, 1400-1600 m, 10.vi.1985, st. 245, 1 ♂, Hakkari, 8 km E of Uludere, 1700-1900 m, 11/13.vi.1985, st. 246, 25 ♂♂ and 5 ♀♀, Hakkari, 10 km SE of Uludere, 1000 m, 12.vi.1985, st. 247, 4 ♂♂, Hakkari, 50 km E of Uludere, 1300 m, 14.vi.1985, st. 250, 6 ♂♂ and 5 ♀♀, Hakkari, Zab valley road to Çukurca, 35 km SW of Hakkari, 950-1100 m, 15/16.vi.1985, st. 253, 1 ♂ and 2 ♀♀, Hakkari, Zab valley, 32 km SW of Hakkari, 1200 m, 16.vi.1985, st. 254, 1 ♂ and 5 ♀♀, Hakkari, Zab valley, 24-26 km SW of Hakkari, 1250 m, 16.vi.1985, st. 255, 7 ♂♂ and 1 ♀, Hakkari, Zab valley, 15 km NE of Hakkari, 1300 m, 17.vi.1985, st. 256.

TURKEY, collected by S. Wagener and H. Falkner: 8 ♂♂, Siirt, 22 km W Uludere, 1120 m, 2.vi.1985, loc. 52, 1 ♂, Siirt, 5 km E Sirnak, 1260 m, 2.vi.1985, loc. 50, 1 ♂, Siirt, 10 km E Sirnak, 1360 m, 2.vi.1985, loc. 51, 8 ♂♂, Mardin, 30 km NW Mardin, 1100 m, 31.v.1985, loc. 42, 10 ♂♂, Mardin, 40 km NW Mardin, 1100 m, 31.v.1985, loc. 43, 6 ♀♀, Mardin, 4.5 km NW Mazidagi, 1100 m, 31.v.1985, loc. 44, 5 ♂♂ and 5 ♀♀, Mardin, 10 km NE Derik, 1100 m, 31.v.1985, loc. 45, 5 ♂♂ Mardin, 13 km SE Midyat, 900 m, 1.vi.1985, loc. 48, 1 ♀, Hakkari, Suvarihalil Geç. E-side, 1320 m, 5.vi.1985, Loc. 65, 5 ♂♂, Hakkari, 20 km NE Hakkari, 1500 m, 6.vi.1985.

IRAQ, collected by L. G. Higgins: 12 ♂♂ and 1 ♀, Irak, Kurdistan, Sallahuddin, 3400 ft, 3/10.vi.1957.

The holotype and most paratypes are deposited in the collection of the Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Amsterdam. Other paratypes are in the collections of the British Museum (Natural History),

London (BMNH), the Rijksmuseum van Natuurlijke Historie, Leiden and in the private collections of Dr. S. Wagener (Bocholt, BRD) and Mr. G. Hesselbarth (Diepholz, BRD).

Description

Male: Wingspan (n = 40) 23-34 (30) mm. Upper side: brown as in nominate subspecies. Underside: light greyish brown, paler than in nominotypical subspecies so that the white postdiscal markings have less contrast; zigzag shape of white postdiscal markings in 1b, 1c and 2 of hind wing showing an inwardly pointing V-shape in 1c as often present in females of nominotypical subspecies; hind wing submarginal markings very reduced; small submarginal black spot in 2 bordered inwards by orange, black and white scales; submarginal area in 1b filled with blue scales hardly bordered inwardly; anal lobe black, inwardly bordered by whitish scales; black tail with white scales at the tip is attached to vein 2.
Female: Wingspan (n = 40) 29-37 (33) mm. Upper side: slightly lighter brown than in male, postdiscal field of forewing mostly with more or less orange scales. Underside: light greyish brown, paler than in nominotypical female; zigzagging of white postdiscal markings in 1b to 2 including V-shape in 1c on hind wing more pronounced than in male, other markings as in male.

Variation: The orange scales on the forewing upper side of the female are completely absent in only 15% of the specimens studied (about 70% in the nominotypical subspecies). The underside colour has a minor variation, but in both sexes the darkest specimen is still lighter than the lightest specimen of the nominotypical subspecies. The hind wing underside submarginal markings are more or less pronounced, but on the average less than in the nominotypical subspecies. The blue area in 1b is inwardly bordered with orange scales in only a few specimens, whilst this feature is very common in the nominotypical subspecies. The postdiscal white markings can be vague or almost absent on the forewing underside, and the zigzagging of those markings on the hind wing underside can vary somewhat but are most pronounced, in particular the V-shape, in populations in the hot wet biotopes in the province of Hakkari and in the specimens studied from North Iraq and West Iran. The length of the tail is variable from population to population as in the nominotypical subspecies and hence the tail can not be used as a distinguishing character.

Biotope

We found *S. i. zabni* in dry hot biotopes with scarce vegetation as well as in wet biotopes in deep hot valleys with rich vegetation and different kinds of broad-leaved trees. The food plant, *Quercus* brushwood, was always present. Most of the wet localities become dry towards the end of the flight period of *Satyrium ilicis*.

Derivation of the name

During our study we were informed by Mr. Campbell Smith of the BMNH, London, of a series of *S. ilicis* (12 ♂♂, 1 ♀) from the Zab valley in North Iraq with handwritten notes of the late Dr. L. G. Higgins. From these notes we learned that Higgins once had thought of describing his series under the name *zabni*. We have included Higgins' series in the type series because Higgins' specimens from North Iraq are similar to the populations of the Zab valley in the Turkish province of Hakkari. We have chosen the name *zabni* as a tribute to the entomological merits of L. G. Higgins.

Distribution

The distribution of *S. i. zabni* in Turkey is as indicated in figure 1. From material of the BMNH, London, and of some private collections, a.o. Wagener (Bocholt, BRD), Hesselbarth (Diepholtz, BRD), Eckweiler (Frankfurt, BRD) and Rose (Mainz, BRD) we found that the distribution of *zabni* extends at least to North Iraq and to the Zagros mountains in Iran, from which areas we have not seen any specimen of the nominotypical subspecies.

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