Description of a new subspecies of *Polyommatus ciloicus* DE FREINA & WITT, 1983: *alamuticus* ssp. n. from North Iran (Alburz Mts.) (Lepidoptera: Lycaenidae)

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Abstract: In the present paper a new subspecies of *Polyommatus ciloicus* DE FREINA & WITT, 1983 from western part of Central Alburz (Iran) is described and illustrated: ***alamuticus* ssp. n.** (male holotype in coll. Pest and Plant Diseases Research Institute [PPDRI], Tehran, Iran). Males of the new taxon can be distinguished by broader wings, deep blue colour with completely black marginal line on upperside, fine and definitive markings of underside and totally white fringes. Information on ecology and distribution is provided.

Eine neue Unterart von *Polyommatus ciloicus* DE FREINA & WITT, 1983: *alamuticus* ssp. n. aus Nordiran (Lepidoptera: Lycaenidae)

Zusammenfassung: Eine neue Subspezies von *Polyommatus ciloicus* DE FREINA & WITT, 1983 wird aus dem westlichen zentalen Elburs (Iran, Qazvin) beschrieben und abgebildet: ***alamuticus* ssp. n.** (Holotypus Männchen in coll. Pest and Plant Diseases Research Institute [PPDRI], Teheran, Iran). Männchen der neuen Unterart unterscheiden sich durch breitere Flügel und die dunkler blaue Grundfarbe mit kompletter schwarzer Marginallinie auf der Flügeloberseite von den anderen Unterarten. Die Zeichnungselemente der Flügelunterseite sind fein, jedoch scharf gezeichnet, die Fransen rein weiß. Angaben zur Verbreitung und Ökologie werden ergänzt.

توصيف يک زير گونه جديد از پروانه *P. ciloicus* DE FREINA & WITT, 1983 به نام *P. ciloicus alamuticus* ssp. nov. از شمال ايران (کوههای البرز) (Lepidoptera: Lycaenidae)

در اين مقاله زير گونه جديدي پروانه ازخانواده Lycaenidae با نام *Polyommatus ciloicus alamuticus* (n. ssp.) همراه با تصاوير رنگي براي اولين بار از منطقه کوههاي البرز غربي واقع درشمال قزوين (ايران) توصيف مي گردد. اين تاکسون جديد با مشخصاتي مانند بالهاي وسعيتر ،رنگ زمينه آبي عميق و نقوش مشخص طرح زير بال از ديگر تاکسونهاي وابسته و مشابه به راحتي قابل تشخيص مي باشد . همچنين زيستگاه اين زير گونه جديد از زيرگونه هاي ديگر بسيار دور وايزوله بوده که بدين سبب با ديگر تاکسونهاي وابسته حالت غيرهمبوم (allopatric) را به نمايش مي‌گذارد . اطلاعات بيشتري نيزدر رابطه با پراکنش و اکولوژي اين تاکسون جديد همراه با نقشه پراکنش در متن مقاله آورده شده است . اين تاکسون که توسط همکار نويسنده مقاله آقاي جلال الدين بهرامي (قزوين) براي اولين بار کشف و صيد گرديده به علت همجواري زيستگاه آن با منطقه کوهستاني و تاريخي الموت *alamuticus* ناميده شد.

Introduction

While searching for new early-flying butterflies in northern Iran, our colleague Mr. Jaleleddin BAHRAMI discovered a new entity of the genus *Polyommatus* LATREILLE, 1804 north of Qazvin at the westernmost part of Central Alburz. The new taxon is interpreted as a new subspecies of *Polyommatus ciloicus* DE FREINA & WITT, 1983, which is known very locally from SE Anatolia, province Hakkari (DE FREINA & WITT 1983). Recently also another subspecies of *P. ciloicus* has been detected and described from NW Iran, province Azarbayjan-e Gharbi: *P. ciloicus azarisorum* WEIDENHOFFER, 2002.

We also provide interesting new distributional information about the presence of the scarce *Pseudophilotes bavius* (EVERSMANN, 1832) at the type locality of the new subspecies.

P. ciloicus from Qazvin can be distinguished from both other subspecies and is described as follows:

Polyommatus ciloicus alamuticus ssp. n.

Holotype ♂: Iran, Qazvin prov., N. Qazvin, 2000 m, 23. v. 2005, leg. A. R. NADERI, coll. Pest and Plant Diseases Research Institute (PPDRI), Tehran, Iran. Fig. 1.

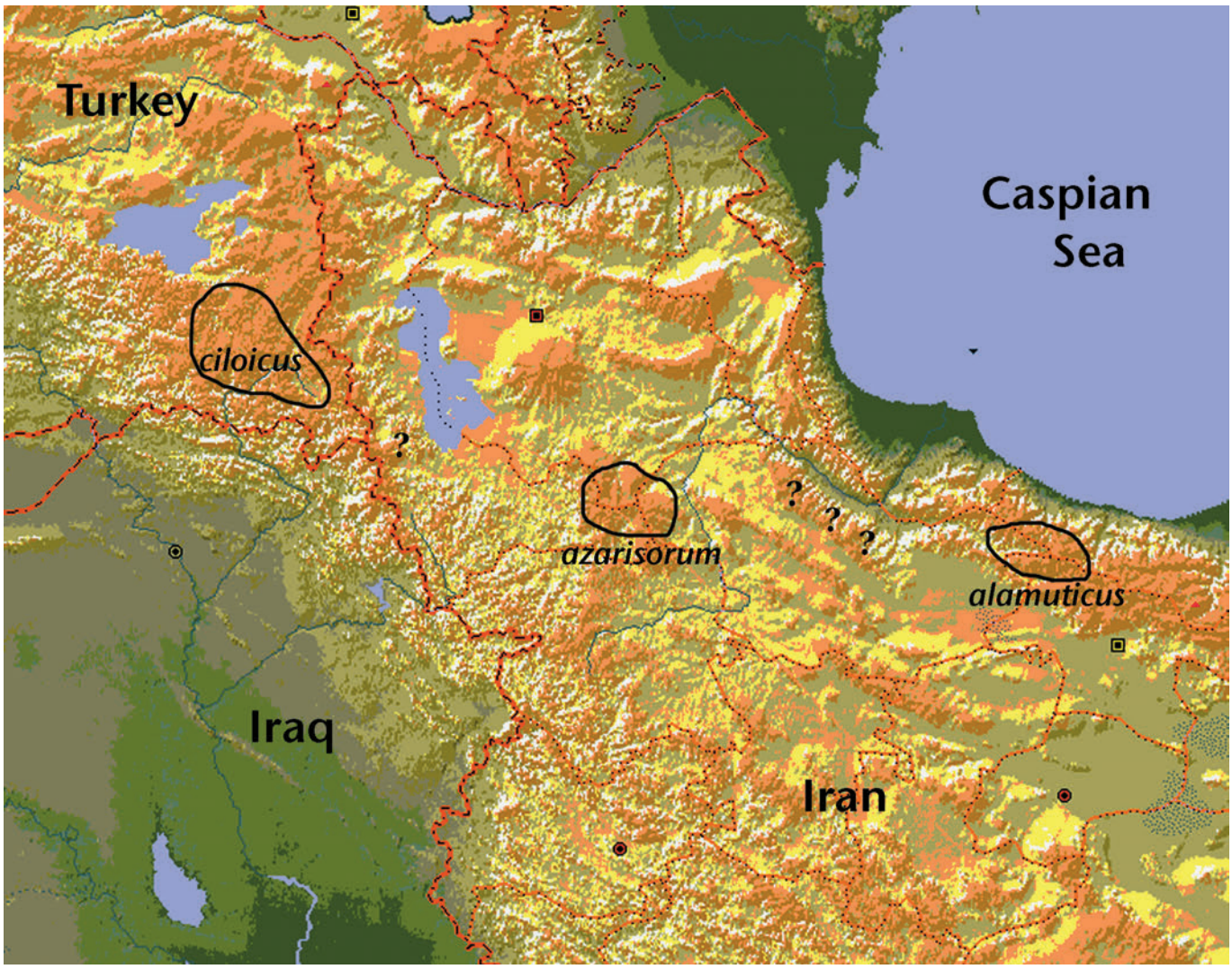
Paratypes (in total 50 ♂♂, 14 ♀♀, alle **Iran**): 4 ♂♂, N. Qazvin, 2000 m, 20. v. 2004, leg. et coll. J. BAHRAMI (Qazvin). 2 ♂♂, same data, leg. J. BAHRAMI, coll. NADERI. 3 ♂♂, N. Qazvin, 2000 m, 5. VI. 2004, leg. et coll. J. BAHRAMI. 1 ♂, same data, leg. J. BAHRAMI, coll. NADERI. 16 ♂♂, 2 ♀♀, same data as holotype; in collections: 2 ♂♂, 1 ♀, leg. et coll. J. BAHRAMI; 10 ♂♂, 1 ♀, leg. et coll. NADERI; 1 ♂, leg. NADERI, coll. W. TEN HAGEN; 1 ♂, leg. NADERI, coll. W. ECKWEILER (Frankfurt am Main); 1 ♂, leg. NADERI, coll. G. BETTI (Courmes, France); 1 ♂, leg. NADERI, coll. F. CARBONELL (Saint-Ouen-l'Aumône, France). 5 ♂♂, 5 ♀♀, same locality as holotype, 31. v. 2006, leg. et coll. NADERI (1 ♂ will be deposited in coll. Staatliches Museum für Naturkunde Karlsruhe, SMNK). 9 ♂♂, 4 ♀♀, Qazvin, 50 km NE Qazvin, 1950–2200 m, 3. VI. 2006, leg. et coll. SCHURIAN (Kelkheim). 8 ♂♂, 3 ♀♀, same data, leg. et coll. TEN HAGEN (1 ♂ of these will be deposited in Senckenberg-Museum, Frankfurt am Main, SMFL). 2 ♂♂, Qazvin, 40 km NE Qazvin, 2300 m (Paßhöhe), 3. VI. 2006, leg. SCHURIAN, 1 ♂ in coll. SCHURIAN, 1 ♂ in coll. TEN HAGEN.

Etymology: The new taxon is named after the famous ancient Alamut castle and mountainous area in the vicinity of the type locality.

Description

♂ (Figs. 1 [holotype], 3): Forewing length (from apex to base) 16–18 mm (HT: 18 mm). Forewing apex pointed. Upperside: ground colour of both wings deep blue, completely whitish fringes covered by short black scales on base, outer margin of wings about 0.5 mm likewise black. Veins of both wings from margin to postdiscal area narrowly covered with black scales. A shadow of underside markings can be seen as black spots rounded by white from upperside view in the blue ground colour. The outer margin of hindwings is covered by a black dust in costal area.

Underside: The ground colour is dark cream. A greenish-blue dust extends from base of hindwings to discoidal area. Markings, typical for *Polyommatus,* are well defined.



Distribution map of the subspecies of *Polyommatus ciloicus*.

Basal ocelli, black with white ring, are usually present (missing in holotype). Discoidal spots of both wings are clear as black reniform ocelli surrounded by white. Similar spots in postdiscal area of both wings which are almost of the same size. All ocelli are smaller on hindwing. On forewing a clear, small, white ray in M2 can be seen extending from marginal spots to inferior part of discoidal spot; in M3 a shorter white triangle. A very wide, wedge-shaped, white strike reaches from submarginal to inferior part of discoidal spot of hindwings, cutting the row of postdiscal ocelli. A sequencing row of light brown dots, proximally and distally bordered by white, partly with very light yellowish scales proximally, can be seen in submarginal area of both wings.

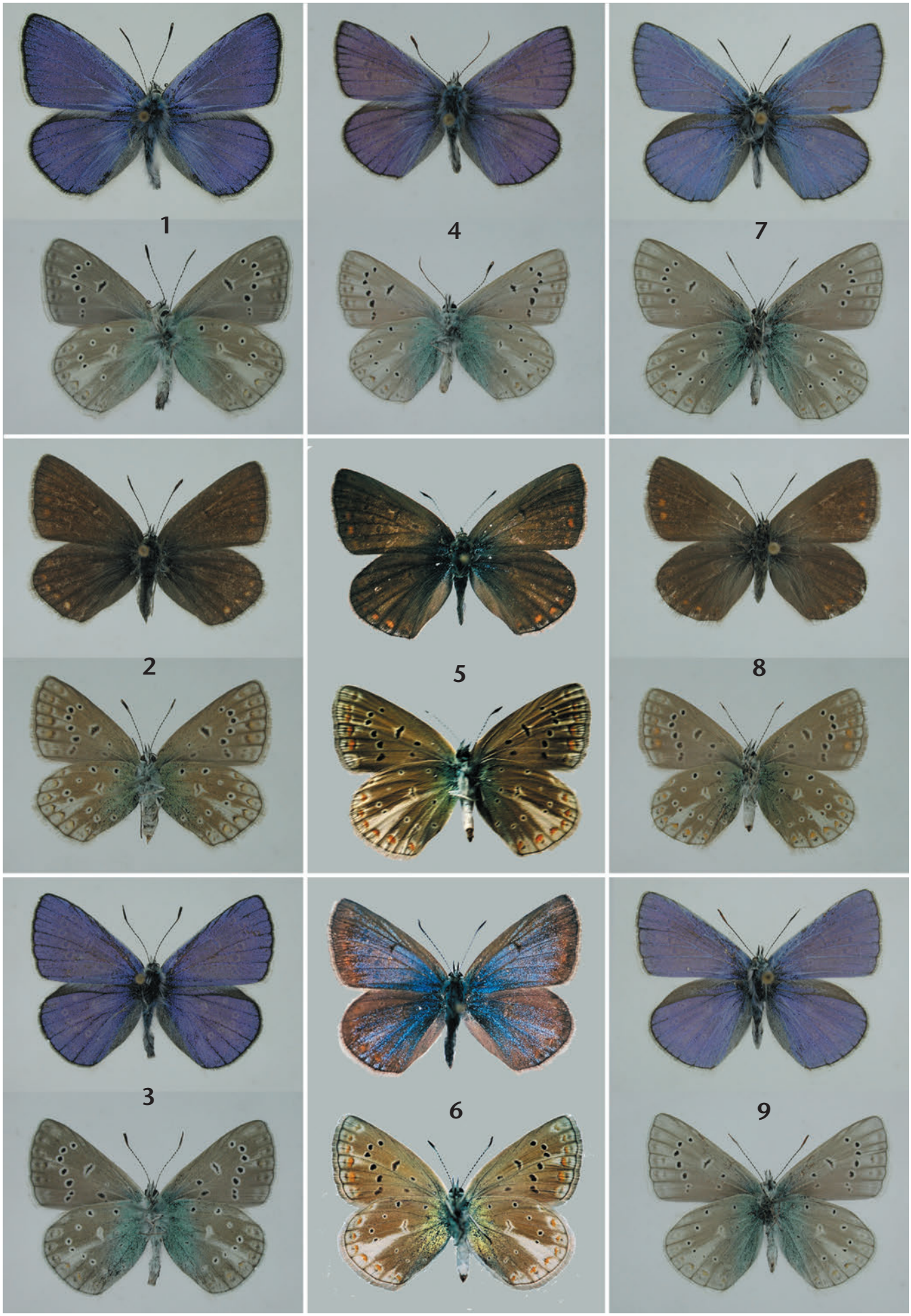
♀ (Fig. 2): Somewhat smaller than ♂: 15–16 mm. Upperside: forewing triangular and pointed with dark brown ground colour. Discoidal spot of forewing conspicuous, darker. There is a row of yellow-orange spots in submarginal area of both wings, clearer and lighter in hindwings. Fringes light brown, basally covered with dark scales.

Underside: Ground colour light brown. Markings and ocelli like in ♂♂, but more conspicuous. Whitish submarginal dots with little dark nucleus, proximally bordered by dark triangles. Submarginal light orange spots more regular and visible than in males. Little white triangles between postdiscal ocelli and submarginal area of both wings. Additionally prominent white triangle on hindwing reaching inferior part of discoidal spot. Basal area dusted with blue-green scales.

Variation

There is no significant variation within the collected type series of *P. c. alamuticus*. Wing length of ♂♂ varies from 16 to 18 mm. Little variation in deep blue ground colour of ♂ upperside. Basal spots sometimes absent. In most specimens postdiscal spots on hindwing underside are cut by the broad white strike, sometimes the white wedge-shaped strike is a little bit reduced and all postdiscal spots are present.

Colour plate: The subspecies of *Polyommatus ciloicus* (upper- and underside). **Figs. 1–3:** *P. ciloicus alamuticus* ssp. n. Fig. 1: ♂, holotype, Iran, Qazvin Prov., N Qazvin, 2000 m, 23. v. 2005, leg. A. R. Naderi, coll. PPDRI. Fig. 2: ♀, paratype, same data as holotype, leg. et coll. Naderi. Fig. 3: ♂, paratype, same data as holotype, leg. et coll. Naderi. **Figs. 4–6:** *P. ciloicus ciloicus*. Fig. 4: ♂, Turquie, Hakkari, Zap carr., Yuksekova, 1700–2000 m, 9. vi. 2002, leg. G. Betti, coll. ten Hagen. Figs. 5–6: ♀, same data, leg. et coll. G. Betti, photos C. Castelain. **Figs. 7–9:** *P. ciloicus azarisorum,* Iran, Zanjan, NE Takab, 2200 m, 9./10. vi. 2003, leg. et coll. ten Hagen. Figs. 7, 9: ♂♂. Fig. 8: ♀.



Differential diagnosis

Unfortunately only limited butterfly material, photos (kindly provided by Dr. Georges Betti and Christian Castelain, France) and pictures (de Freina & Witt 1983, Hesselbarth et al. 1995, Weidenhoffer 2002) had been available for comparison. All subspecies of *ciloicus* are extremely rare in collections.

♂: The most important characteristic differentiating *alamuticus* ssp. n. from nominotypical ssp. *ciloicus* and ssp. *azarisorum* beside the slightly bigger size is especially the deep blue ground colour of ♂ upperside which resembles that of *Polyommatus thersites* (Cantener, [1835]). Ground colour is lighter blue in *azarisorum* (Figs. 7, 9) and deep violet-blue in ssp. *ciloicus* (Fig. 4). Every single ♂ could be assigned to a subspecies just by the upperside ground colour. Forewings are pointed and wings are a little broader which are good signs to differentiate it from the two other subspecies.

In *alamuticus* ssp. n. fringes are totally white, basally covered by short, deep black scales; similar in ssp. *ciloicus,* but differing from white and dark brown in *azarisorum*. The contrast between the white and dark parts of the fringes is best seen in *alamuticus* ssp. n. and pointed by the black marginal line. The costal area of hindwings is mostly covered by a black dust which is absent or faint in the other subspecies.

Underside: The dark creamy ground colour in *alamuticus* ssp. n. is different from lighter ones in *ciloicus* and *azarisorum*. On forewing the series of inconspicuous white patches between submarginal and postdiscal area of *ciloicus* and *azarisorum* is limited to a couple of clear white patches in spaces M2, M3 (nomenclature as in Hesselbarth. et al. 1995) in *alamuticus*.

♀: Upperside: The discal spot of the forewings is clearly visible on the dark brown background in *alamuticus* ssp. n., while nearly invisible in *azarisorum*. The yellow marginal spots tend to be more orange in *ciloicus* (Figs. 5, 6) and *azarisorum* (Fig. 8). Only a single *ciloicus*-♀ with beautiful blue upperside (Fig. 6), belonging to the nominotypical subspecies, has been found. Due to the limited material nothing can be said on the occurrence of this form in the other subspecies.

Underside: The dark creamy ground color in *alamuticus* is different from lighter ones in *ciloicus* and *azarisorum*. The inconspicuous white patches between submarginal and postdical areas in *ciloicus* and *azarisorum* are limited to a single clear white patch in space M3 of forewing in *alamuticus* ssp. n.

As in the ♂♂, the forewings of ♀♀ are pointed and broader in *alamuticus*.

Ecology and distribution

The type locality of *alamuticus* ssp. n. is a small green valley with dense cover of different plants and a small stream of water at an altitude of about 2000 m. In the steep sides of the valley some cushion-like plants such as *Onobrychis cornuta, Astragalus* species (Fabaceae) and *Acantholimon* species (Plumbaginaceae) are growing. In less steep parts there are also many different herbs, different species of Fabaceae, e.g. *Vicia* sp., densely grown among tall grasses. The type locality is cold and humid with snow coverage of about one meter in winter.

♂♂ are attracted to blooms of Fabaceae and tend to hide amongst their stems in cloudy times and at night. One of this Fabaceae is likely to be the larval foodplant of *alamuticus,* but we could not observe ovipositing ♀♀. Only 2 ♀♀ have been observed and it is hard to find them on the wing. One of the collected ♀♀ was found on a *Vicia* bush sheltered in the shadow of a *Salix* tree. It remains unknown whether the larval habitat is different or identical to the mentioned habitat.

♂♂ tend to have a very fast and short flight. In warm hours of the day, accompanied by at least 15 other butterfly species, mostly lycaenids, the ♂♂ congregate for mud-puddling behaviour on wet patches of soil.

The following butterfly species were observed syntopic and synchronous: *Parnassius mnemosyne nubilosus* Christoph, 1873, *Anthocharis damone eunomia* (Freyer, [1851), *Lycaena (Thersamonia) asabinus* (Herrich-Schäffer, [1851]), *Lycaena (L.) tityrus* (Poda, 1761), *Tomares callimachus* (Eversmann, 1848), *Cupido staudingeri* (Christoph, 1873), *Pseudophilotes vicrama schiffermuelleri* (Hemming, 1929), *Pseudophilotes bavius* (Eversmann, 1832), *Polyommatus (Cyaniris) semiargus* (Rottemburg, 1775), *Polyommatus (P.) amandus* (Schneider, 1792), *Proterebia afra* (Fabricius, 1787), *Euphydryas aurinia bulgarica* (Fruhstorfer, 1917), *Melitaea arduinna* (Esper, [1783]). For the rare and local *Psph. bavius* it is the first record on southern slopes of the Alburz mountains. Except for *Psph. bavius, T. callimachus,* and *L. asabinus* all other species could also been found in the type locality of *P. ciloicus azarisorum*.

Discussion

P. ciloicus is distributed in extreme southeast of Turkey and northwestern part of Iran (see distribution map). Its known distribution is limited to 3 disjunct small areas. All localities are situated in middle heights (1400–2300 m) of higher mountain chains.

The nominotypical subspecies flies in a small area in Hakkari province in SE of Turkey and might also occur in the mountains bordering Iran. Until now the subspecies *azarisorum* is found only in a small spot in a mountainous area in south of Iranian Azerbaijan, and the third subspecies, *alamuticus* ssp. n., just has been detected from a highly isolated area in the westernmost part of Central Alburz Mts. The occurrence of a population in the mountains north of Zanjan (Ghaflankuh mountains) or in central Zagros mountains seems to be plausible, but further investigations are needed for confirmation.

The occurrence of *P. ciloicus* seems to depend on mea-

dows with rich, luxurious, knee-high vegetation in middle heights of the mountains (de Freina & Witt 1983, Hesselbarth et. al. 1995, Weidenhoffer 2002, own observations). In summer-dry regions of Iran and eastern Anatolia such meadows can be expected only in higher mountains with sufficient melting snow and water until summer. Most mountains of NW Iran are not high enough and too dry in summer. Normally areas with potentially luxurious meadows are agriculturally used or destroyed by overgrazing. The small type locality of *azarisorum* is a protected area which seems to be used only for production of hay in July and grazing is prevented.

P. ciloicus alamuticus ssp. n. as well as ssp. *asarisorum* have been found in conspicuous combination with *Vicia* plants: we often observed nectaring on flowers and also resting on leaves. It might be possible that *Vicia* is also a larval foodplant, but we did not observe egg-laying behaviour.

Protreating of ice and severe coldness during the last glacier period seem to be important for disjunction of favorite habitats for mountainous butterfly species like *P. ciloicus*. The intervals between these high mountains now are covered by deep dry valleys or vast warm low level steppes. Gen exchange is not likely to occur between the known ssp. of *ciloicus*.

We cannot exclude that the taxonomy of *ciloicus* has to be revised in future. Further investigations on distribution, but especially on larval foodplant, early stages and life cycle of this interesting species are needed.

Acknowledgements

We would like to appreciate Dr. Georges Betti (Mougins, France) and Christian Castellain (France) for providing photos and material of the nominotypical subspecies for comparison and to Vazrick Nazari (University of Alberta, Canada) for editing an earlier version of the English text. We are grateful to our colleague Mr. Jalaleddin Bahrami (Qazvin, Iran), discoverer of the new taxon, for the opportunity to describe it, for supplying specimens and valuable information on the type locality. The first author is greatly indepted to his father, Gholamreza Naderi, for accompanying in his field trips.

References

de Freina, J. J., & Witt, T. J. (1983): Zwei neue Lycaenidae-Arten aus Türkisch Kurdistan: *Lysandra dezina* sp. n. und *Polyommatus ciloicus* sp. n. – Entomofauna, Ansfelden, **4** (14): 181–197.

Hesselbarth, G., van Oorschot, H., & Wagener, S. (1995): Die Tagfalter der Türkei unter Berücksichtigung der angrenzenden Länder. – Bocholt (S. Wagener), **1–2:** 1354 pp., **3:** 843 pp.

Nazari. V. (2003): Butterflies of Iran. – Tehran (National Museum of Natural History of the Islamic Republic of Iran, Dayereh-Sabz); 568 pp., 74 col. pls.

Weidenhoffer, Z. (2002): New records of blue butterflies of the subfamily Polyommatinae from Iran (Lepidoptera: Lycaenidae). – Entomologische Zeitschrift, Stuttgart, **112** (3): 74–77.

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Entomologische Notiz

Seltene Zuchtüberraschung: Schlupf eines Halbseitengynanders von *Lycaena helle* ([Denis & Schiffermüller], 1775) (Lepidoptera: Lycaenidae)

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Im November 2005 erwarb ich auf der Internationalen Insektentauschbörse in Frankfurt am Main 7 Puppen von *Lycaena helle*. Das aus Polen stammende Zuchtmaterial legte ich zu Hause zwischen Leinenläppchen und brachte es zur Überwinterung im Puppenkasten unter. Der Puppenkasten steht an einer geschützten Stelle im Freien.

Es war erst Mitte April 2006, als ich wieder eine meiner regelmäßigen Kontrollen im Puppenkasten vornahm. Dabei stellte ich fest, daß sich eine der Puppen sehr dunkel (fast schwarz) verfärbt hatte. Mir war bekannt, daß sich bei der Zucht von *L. helle* sowohl helle, beigefarbene als auch dunkle Puppen ergeben können. Die auf der Insektentauschbörse erworbenen Puppen waren aber ausschließlich hell, so daß ich von gesundem Zuchtmaterial ausgehen konnte. Dunkle Puppen bergen die Gefahr, daß unter Umständen auch abgestorbene Exemplare dabei sind. Da es von der Jahreszeit her eigentlich noch etwas zu früh war, als daß sich die Puppen zur Ankündigung des Schlupfes dunkel verfärbten, ging ich davon aus, daß die eine Puppe während der Überwinterung abgestorben war. Sicherheitshalber legte ich sie aber in meinem Zimmer mit Südfenster in einen Blumentopf.

Einige Tage später fragte mich meine Frau beim Abendessen, ob ich den kleinen Falter am Fenster meines Zimmers bemerkt hätte. Beim Staubsaugen habe sie ihn am Morgen fliegen gesehen. Ich verneinte dies, dachte mir aber nichts weiter dabei, da ich zu dieser Zeit in meinem Zimmer noch anderes Zuchtmaterial hatte.

Nach dem Essen ging ich in mein Zimmer, um nach dem Falter zu sehen. Was ich dann nach einigem Suchen vorfand, verschlug mir

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