

Butterfly and skipper records from Lebanon (Lepidoptera: Papilionoidea)

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Abstract – Eighty-five specimens of 30 papilionoid species have been collected in Lebanon during entomological expeditions launched in 2015 and 2016 by the joint project of the Hungarian Natural History Museum and the Holy Spirit University of Kaslik. The collecting sites and events are listed, and the species annotated. With 23 figures.

Key words – HesperIIDae, Levant, Lycaenidae, Nymphalidae, Papilionidae, Pieridae

INTRODUCTION

In the frame of the mutual agreement between the Holy Spirit University of Kaslik (USEK; Kaslik, Jounieh, Lebanon) and the Hungarian Natural History Museum (HNHM; Budapest, Hungary) for exploring biodiversity of Lebanon two entomological trips were launched visiting the Mount Lebanon range. During this work 41 collecting sites were sampled, of which 15 yielded also butterfly records.

LARSEN (1974) presented a magnificent synopsis of the Lebanese butterflies. However, since the outbreak of the first Lebanon war (1975) field works in the region were getting more and more difficult and hazardous. Consequently, the published faunistic data in the literature are rather scanty. The purpose of the present paper is to publish the collecting data and an annotated list of the butterflies collected during the USEK-HNHM trip.

In the list of collecting sites the geographical names with coordinates and the used methods are given according to their numeric codes in temporal sequence. The scientific names of butterfly or skipper species recorded in the given

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site are presented in alphabetical order between parentheses. Nomenclature and classification follow THSIKOLOVETS (2011).

In the list of species the names are given in alphabetical order according to higher categories (families), then to genus-group and species-group names (again in alphabetic order). Then the year of the record and the numerical code of the site(s) follow(s) where the species has been collected (with the number of specimens and their sex given in brackets). Every species is annotated on the basis of LARSEN (1974) and HESSELBARTH *et al.* (1995), and further sources as indicated, plus sometimes supplemented by personal insights.

The material is deposited in the Lepidoptera Collection of HNHM.

LIST OF COLLECTING SITES

(Figs 1–5)

- No. 2015_3 (Fig. 1) – Lebanon, Northern gov., Bcharre env., 1 km E Ariz, Horsh Arz el-Rab, ancient cedar forest, swept & singled, 34° 14' 33.68" N, 36° 2' 59.71" E, 1900 m, 20.V.2015, leg. A. Márkus & T. Németh (*Callophrys rubi*, *Polyommatus amandus anthea*, *P. semiargus antiochenus*).
- No. 2015_6 (Fig. 2) – Lebanon, Northern gov., Ehden, Horsh Ehden Natural Reserve, swept & singled, 34° 18' 33.52" N, 35° 59' 14.09" E, 1525 m, 21.V.2015, leg. M. Boustani, A. Márkus & T. Németh (*Coenonympha pamphilus neolyllus*, *Colias croceus*, *Zerynthia deyrollei eisneri*).
- No. 2015_8 (Fig. 1) – Lebanon, Northern gov., Bcharre env., 1 km E Ariz, Horsh Arz el-Rab, ancient cedar forest, swept & singled, 34° 14' 33.68" N, 36° 2' 59.71" E, 1900 m, 22.V.2015, leg. A. Márkus, T. Németh, M. Rehayem & W. Yammine (*Colias croceus*, *Plebejus zephyrinus nichollae*, *Polyommatus ellisoni*, *P. isauricoides*).
- No. 2015_9 (Fig. 3) – Lebanon, Northern gov., Tannourine env., 2 km N Harissa, Tannourine Cedars Nat. Reserve, swept & singled, 34° 12' 34.56" N, 35° 55' 45.15" E, 1750 m, 23.V.2015, leg. O. Akiki, M. Boustani, A. Márkus, N. Nemer, T. Németh, M. Rehayem & W. Yammine (*Coenonympha pamphilus neolyllus*, *Lycaena ochimus*, *Melitaea persea montium*, *Parnassius mnemosyne nebulosus*, *Polyommatus semiargus antiochenus*).
- No. 2015_12 (Figs 4–5) – Lebanon, Northern gov., Bcharre env., Quadisha Valley, swept & singled, 34° 14' 57.29" N, 35° 58' 34.29" E, 970 m, 27.V.2015, leg. M. Boustani, A. Márkus, T. Németh & M. Rehayem (*Limenitis reducta*, *Satyrium spini melantho*, *Thymelicus hyrax*).
- No. 2016_1 (Fig. 3) – Lebanon, Northern gov., Tannourine env., 2 km N Harissa, Tannourine Cedars Nat. Reserve, swept & singled, 34° 12' 34" N, 35° 55' 45" E, 1750 m, 16.VI.2016, leg. A. Kotán, P. Nemes & T. Németh (*Hipparchia*



Figs 1–5. Collectings sites in Lebanon. 1 = Northern gov., Bcharre env., 1 km E Ariz, Horsh Arz el-Rab, ancient *Cedar* forest (nos 2015_3, 8, 2016_11), 2 = Northern gov., Ehden, Horsh Ehden Natural Reserve (nos 2015_6, 2016_9), 3 = Northern gov., Tannourine env., 2 km N Harissa, Tannourine Cedars Nat. Reserve (nos 2015_9, 2016_1, 2, 6, 14, 26), 4–5 = Northern gov., Bcharre env., Quadisha Valley (no. 2015_12) (all photos T. Németh, HNHM)

- syriaca*, *Limenitis reducta*, *Melanargia titea palestinensis*, *Plebejus idas selda*, *Thymelicus lineola melissus*, *Th. sylvestris syriaca*).
- No. 2016_2 (Fig. 3) – Lebanon, Northern gov., Tannourine env., 2 km N Harissa, Fuvar, stream valley, swept & beaten, 34° 12' 22" N, 35° 55' 17" E, 1460 m, 17.VI.2016, leg. A. Kotán, P. Nemes & T. Németh (*Carcharodus alceae alceae*, *Colias croceus*, *Gonepteryx rhamni*, *Lampides boeticus*, *Melanargia titea palestinensis*, *Pieris rapae*, *Plebejus agestis*, *P. bassoni*, *Thymelicus lineola melissus*, *Th. sylvestris syriaca*).
- No. 2016_4 – Lebanon, Northern gov., 7 km NE Batroun, Moghr Al Ahoual, macchia, swept & singled, 34° 17.104' N, 35° 52.771' E, 715 m, 18.VI.2016, leg. A. Kotán, P. Nemes & T. Németh (*Colias croceus*, *Satyrrium spini melantho*).
- No. 2016_6 (Fig. 3) – Lebanon, Northern gov., Tannourine env., 2 km N Harissa, Tannourine Cedars Nat. Reserve, swept & singled, 34° 12' 34" N, 35° 55' 45" E, 1750 m, 18.VI.2016, leg. A. Kotán, P. Nemes & T. Németh (*Melanargia titea palestinensis*, *Plebejus agestis*, *Thymelicus sylvestris syriaca*).
- No. 2016_9 (Fig. 2) – Lebanon, Northern gov., Ehden, Horsh Ehden Natural Reserve, swept & singled, 34° 18' 33" N, 35° 59' 14" E, 1525 m, 19.VI.2016, leg. A. Kotán, P. Nemes & T. Németh (*Gonepteryx rhamni*, *Pyrgus serratulae alveoides*).
- No. 2016_11 (Fig. 1) – Lebanon, Northern gov., Bcharre env., 1 km E Ariz, Horsh Arz el-Rab, ancient *Cedrus* forest, swept & singled, 34° 14' 33" N, 36° 2' 59" E, 1900 m, 20.VI.2016, leg. M. Boustani, A. Kotán, P. Nemes & T. Németh (*Lampides boeticus*, *Melanargia titea palestinensis*, *Polyommatus amandus anthea*, *P. ellisoni*, *Thymelicus lineola melissus*).
- No. 2016_13 – Lebanon, Northern gov., 5 km NW Nahr Ibrahim, Khdayra, riverside, swept and singled, 34° 5.112' N, 35° 41.602' E, 21.VI.2016, leg. M. Boustani, A. Kotán, P. Nemes, T. Németh & W. Yammine (*Gonepteryx cleopatra taurica*).
- No. 2016_14 (Fig. 3) – Lebanon, Northern gov., Tannourine env., 2 km N Harissa, Tannourine Cedars Nat. Reserve, canopy netting, 34° 12' 34" N, 35° 55' 45" E, 1750 m, 21.VI.2016, leg. P. Nemes & T. Németh (*Argynnis pandora*).
- No. 2016_19 – Lebanon, Northern gov., Bcharre env., 4 km E Ariz, singled, 34° 14.645' N, 36° 5.166' E, 2830 m, 24.VI.2016, leg. M. Boustani, A. Kotán, P. Nemes, T. Németh, M. Rehayem & W. Yammine (*Polyommatus amandus anthea*, *P. ellisoni*).
- No. 2016_26 (Fig. 3) – Lebanon, Northern gov., Tannourine env., 2 km N Harissa, Fuvar, stream valley, at light, 34° 12' 22" N, 35° 55' 17" E, 1460 m, 27.VI.2016, leg. A. Kotán, P. Nemes & T. Németh (*Pararge aegeria*).

LIST OF SPECIES

Hesperiidae

(5 species)

Carcharodus alceae (Esper, [1780]) (Pyrginae) – 2016_2 (1 ♀). According to LARSEN (1974: 207) it is a fairly common species, in Europe mainly typifies landscapes with fields still partly used extensively.

Pyrgus serratulae alveoides (Staudinger, 1901) (Pyrginae) – 2016_19 (1 ♂). LARSEN (1974: 201) indicates that locally it is a very abundant subspecies at high altitudes. In Europe *P. serratulae* is characteristic for landscapes with large open pastures and meadows with barren soil.

Thymelicus hyrax (Lederer, 1861) (Hesperiinae) – 2015_12 (1 ♂). According to LARSEN (1974: 210) it is a Syrian species with a very narrow distribution in Lebanon, and very local. HESSELBARTH *et al.* (1995: 175) states also that the species is very local in all of Turkey.

Thymelicus lineola melissus Zerny, 1932 (Hesperiinae) – 2016_1 (1 ♂), 2016_2 (1 ♂), 2016_11 (5 ♂♂, 2 ♀♀). According to LARSEN (1974: 212) this is typical for higher elevations.

Thymelicus sylvestris syriaca (Tutt, 1905) (Hesperiinae) – 2016_1 (1 ♂), 2016_2 (1 ♂), 2016_6 (1 ♀). LARSEN (1974: 211) mentions the subspecies as “*Adopea flava syriaca*” and remarks that it is common and widely distributed in the higher and middle elevations.

Lycaenidae

(12 species)

Callophrys rubi (Linnaeus, 1758) (Theclinae) – 2015_3 (1 ♂). LARSEN (1974: 147) considers the Levant populations under the subspecific name “*intermedia*” as distinct. TSHIKOLOVETS (2011: 152) indicates the occurrence of non-typical *rubi* for the region. According to LARSEN (1974: 147) although it is sporadic, virtually occurs all over the country from sea level to high mountains. It has an annual brood and the larval host was recorded as *Colutea* in the Lebanon. Ovipositing was also observed on *Colutea* in Greece (see HESSELBARTH *et al.* 1995: 513). In the Pannonian Region, where the species has two generations, the most widely applied larval host is *Cytisus* (BÁLINT, pers. obs.).

Lampides boeticus (Linnaeus, 1767) (Polyommatainae) – 2016_2 (3 ♀♀), 2016_11 (1 ♀). An almost cosmopolitan species, not yet known in the Americas but already introduced to Hawaii. In the Levant it is common and widespread.

There are annual migrations. The larval hosts are various Fabaceae, the species is sometimes pest on pea (*Cajanus*, *Pisum*) in subtropical or tropical regions.

Lycaena ochimus (Herrich-Schäffer, [1851]) (Lycaeninae) – 2015_9 (2 ♂♂). According to LARSEN (1974: 82) it is local but well distributed species at upper heights both in the Lebanon and the Anti-Lebanon. There are two annual broods. The larval host is unknown (HESSELBARTH *et al.* 1995: 497), but most probably it is *Acantholimon* as this plant genus is applied also by *L. thetis* Klug, 1834 in the Balkans as larval host (HESSELBARTH *et al.* 1995: 492).

Plebejus agestis ([Schiffermüller], 1775) (Polyommatinae) – 2016_2 (3 ♂♂), 2016_6 (1 ♂). According to LARSEN (1974: 171–172) it is a widely distributed species from sea level up to 2000 m. Larval hosts are *Erodium* and *Helianthemum* species.

Plebejus bassoni (Larsen, 1974) (Polyommatinae) (Figs 6–7) – 2016_2 (1 ♀). One of the endemic butterflies of the region, described by LARSEN (1974). It is common in the mountains and has three annual broods. The larval host is *Erodium cicutarium*.

Plebejus idas selda (Higgins, 1964) (Polyommatinae) (Figs 8–9) – 2016_1 (1 ♂). In the book of LARSEN (1974: 167) it is obvious that the identification of the species poses a great problem. Therefore all the Levant data have to be critically handled. Because of this problem the distribution and the larval host of this species in the region is not yet clarified.

Plebejus nichollae (Elwes, 1901) (Polyommatinae) (Figs 10–11) – 2015_8 (2 ♂♂). According to LARSEN (1974: 168) this species is often common at upper heights and also in middle elevations. It has a single annual brood. Larval host is *Astragalus*. LARSEN (1974) indicates the existence of a partial second brood but we are of the opinion that that is erroneous and most probably based on misidentification of the similar looking species *Polyommatus gravesi* (Chapman, 1912). The species and its relatives are widely distributed in the Levant region (LARSEN 1974, HESSELBARTH *et al.* 1995: 558–595). Very recently their taxonomy was revised by STRADOMSKY & TIKHONOV (2015). The imagines are very variable regarding their wing shape, verso colouration and pattern.

Polyommatus amandus anthea Hemming, 1932 (Polyommatinae) (Figs 12–15) – 2015_3 (1 ♀), 2016_11 (5 ♂♂), 2016_19 (1 ♀). According to LARSEN (1974: 182–183) this subspecies occurs in the lower slopes of the Lebanon with one annual generation having *Vicia* as larval host. The female specimens taken in 2015 have no blue dorsal wing scaling, what deserves a remark as statistically the blue females are much more common in the Lebanese populations. Interestingly the dorsal surface of the female collected in 2016 is entirely blue. HESSELBARTH *et al.* (1995: 659–660) speculated in length on the question of the subspecific classification of the species but they gave little information on its biology. In

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Figs 6–11. Rare and endemic taxa in the Levant, collected in Lebanon. 6–7: *Plebejus bassoni* (Larsen, 1974), female, environs of Tannourine (no. 2016_2), 6 = dorsal, 7 = ventral. 8–9: *Plebejus idas selda* (Higgins, 1964), male, environs of Tannourine (no. 2016_1), 8 = dorsal, 9 = ventral. 10–11: *Plebejus nichollae* (Elwes, 1901), environs of Bcharre (no. 2015_8), 10 = dorsal, 11 = ventral (all photos G. Katona)

the Pannonian Region the females were ovipositing at five different Fabaceae plant species in a remarkable site (cf. BÁLINT *et al.* 2012): *Coronilla*, *Hippocrepis*, *Onobrychis*, *Trifolium*, and *Vicia* (BÁLINT, pers. obs.).

Polyommatus antiochenus (Lederer, 1861) (Polyommatinae) (Figs 18–21) – 2015_3 (1 ♀), 2015_9 (4 ♂♂, 2 ♀♀). According to LARSEN (1974: 174) it is a local but widespread species through the Lebanon and the Anti-Lebanon at upper heights. There is one generation and the larval host is unknown. In the Pannonian Region the main larval host of the closely related *C. semiargus* (Rottemburg, 1775) is *Trifolium repens* (Fabaceae), but for example in Granada (Spain), in a highly specialized habitat, the host plant *Armeria velutina* (Plumbaginaceae) was recorded (RODRIGUEZ *et al.* 1991).

Polyommatus ellisoni (Pfeiffer, 1931) (Polyommatinae) (Figs 16–17) – 2015_8 (1 ♂), 2016_11 (5 ♂♂), 2016_19 (2 ♂♂). According to LARSEN (1974: 182) it is known only from the Cedar Mountain above 2000 m. Our records of 2015 originate from a slightly lower elevation. There is one annual brood and the larval host is *Vicia*.

Polyommatus isauricoides Graves, 1923 (Polyommatinae) (Figs 22–23) – 2015_8 (2 ♂♂). According to LARSEN (1974: 181) it is well distributed at upper heights of the Lebanon, but not recorded from the Anti-Lebanon. There is one annual brood, and the larval host is supposedly *Astragalus*.

Satyrium spini melantho Klug, 1834 (Theclinae) – 2015_12 (1 ♂), 2016_4 (1 ♀). According to LARSEN (1974: 148) the subspecies is fairly common on the coast and at middle heights, and has a single brood. The main larval host is *Rhamnus*. HESSELBARTH *et al.* (1995: 521) refers to an old record of Staudinger which gives *Prunus spinosa* as larval host, whilst more recent data suggest *Rhamnus*. In Europe, the larval hosts of the nominotypical subspecies are recorded as *Prunus* (see BERGMANN 1952: 319) or *Rhamnus* (GEIGER 1987: 329–330). According to our experiences in Europe (Burgundy, Pannonia and Transylvania) this is a strongly hill-topping species and when the conditions are mesophilous, the larval host is *Prunus*, otherwise in xerophilous rocky *Quercus* shrublands it is *Rhamnus*.

Nymphalidae

(7 species)

Argynnis pandora ([Schiffermüller], 1775) (Nymphalinae) – 2016_14 (1 ♂). According to LARSEN (1974: 120–121) the species has been recorded almost all over the country in single individuals. Indeed this is a strongly vagrant, or sometimes even migratory species with large area fluctuations. Larval hosts are *Viola* spp.

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Figs 12–17. Rare and endemic taxa in the Levant, collected in Lebanon. 12–15: *Polyommatus amandus anthea* Hemming, 1932, 12 = female, brown morph, environs of Bcharre (no. 2015_3), dorsal, 13 = ventral, 14 = female, blue morph, environs of Bcharre (no. 2016_19), dorsal, 15 = ventral. 16–17: *Polyommatus ellisoni* (Pfeiffer, 1931), male, environs of Bcharre (no. 2015_8), 16 = dorsal, 17 = ventral (all photos G. Katona)

Coenonympha pamphilus neolyllus de Lattin, 1950 (Satyrinae) – 2015_6 (1 ♂), 2015_9 (1 ♀). According to LARSEN (1974: 138 and 140) it is a common subspecies at upper heights of both ranges (Lebanon and Anti-Lebanon), but localised from 1000 m upwards. HESSELBARTH *et al.* (1995: 804–809) discussed the species in great details and questioned the subspecific division. In the Pannonian Region this is one of the few species having very late autumnal (November) records for imagines. TSHIKOLOVETS (2011) did not indicate the occurrence of the species in the Levant region, neither BENYAMINI (2002) recorded it from Israel.

Hipparchia syriaca (Staudinger, 1901) (Satyrinae) – 2016_1 (1 ♀). According to Larsen (1974: 132) the species linked to native coniferous forests in the mountains but at middle or lower elevations. According to our experience its relatives *H. fagi* (Scopoli, 1763) in Pannonia, *H. genava* (Fruhstorfer, 1907) in Burgundy, and *H. hermione* (Linnaeus, 1764) in Burgenland are strongly hill-topping species, and this should also refer to *H. syriaca* in the Levant. The larval hosts are *Brachypodium* grasses covering the grounds of the coniferous groves.

Limenitis reducta Staudinger, 1901 (Limenitidinae) – 2015_12 (1 ♂), 2016_1 (1 ♂). According to LARSEN (1974: 111) it is widespread in the mountains of Lebanon and Anti-Lebanon, but never common. It is also widespread in Turkey (HESSELBARTH *et al.* 1995: 978–982). In certain years there are migrations when the species is able to colonize new habitats temporarily. This is especially evident at the edges of the species' range like in Israel and Jordan, but also in the Pannonian and Illyrian regions of Central Europe.

Melanargia titea palestinensis Staudinger, 1901 (Satyrinae) – 2016_1 (1 ♀), 2016_2 (2 ♂♂), 2016_6 (1 ♂), 2016_11 (2 ♂♂, 2 ♀♀). According to LARSEN (1974: 131) the subspecies can be found in grassy places all over Lebanon. It is common and the local populations have sometime very high individual numbers.

Melitaea perseae montium Belter, 1934 (Nymphalinae) – 2015_9 (1 ♂). According to LARSEN (1974: 126) the subspecies is common at high levels in the Lebanon and the Anti-Lebanon ranges, but local. HESSELBARTH *et al.* (1995: 1054–1056) discussed it as the member of the superspecies complex *M. didyma*. A recent approach based on molecular markers showed that *M. perseae* does not belong to the “*didyma*-complex” (see PAZHENKOVA *et al.* 2015).

Pararge aegeria (Linnaeus, 1758) (Satyrinae) – 2016_26 (1 ♀). LARSEN (1974: 141) remarks that it is a locally common species but in lower elevations where suitable shady habitats exist. Our specimen was collected at light, which is not an accidental phenomenon, as the species has been repeatedly caught by light traps in Hungary (cf. SZABÓKY *et al.* 2013).

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Figs 18–23. Rare and endemic taxa in the Levant, collected in Lebanon. 18–21: *Polyommatus anti-ochenus* (Lederer, 1861), environs of Tannourine (no. 2015_9), 18 = male, dorsal, 19 = ventral, 20 = female, dorsal, 21 = ventral. 22–23: *Polyommatus isauricoides* Graves, 1923, male, environs of Bcharre (no. 2015_8), 22 = dorsal, 23 = ventral (all photos G. Katona)

Papilionidae

(2 species)

Parnassius mnemosyne nebulosus Christoph, 1873 (Parnassiinae) – 2015_9 (1 ♂). According to LARSEN (1974: 85) the subspecies is well distributed at upper heights of the Lebanon and the Anti-Lebanon ranges. There is a single brood and the larval host is *Corydalis* (Papaveraceae). HESSELBARTH *et al.* (1995: 267–272) discussed the species in great details and revised the previous subspecific divisions.

Zerynthia deyrollei eisneri (Bernardi, 1970) (Parnassiinae) – 2015_6 (1 ♂). According to LARSEN (1974: 83) it is common and widespread in the Lebanon and the Anti-Lebanon, but does not descend below 900 m. It has one annual brood, and the larval host is *Aristolochia*, which is a plant genus needing shade and humidity under Levant conditions. The species has been monographed by DE FREINA (1979).

Pieridae

(4 species)

Colias croceus (Geoffroy in Fourcroy, 1785) (Coliadinae) – 2015_6 (1 ♀), 2015_8 (2 ♂♂) 2016_2 (1 ♂), 2016_4 (1 ♀). According to LARSEN (1974: 103) this migrant species is common throughout the country during the whole season, but in lower elevation it occurs all the year around. The large number of larval host species all belong to Fabaceae; it is sometimes pest in alfalfa (*Medicago sativa*).

Gonepteryx rhamni (Linnaeus, 1758) (Coliadinae) – 2016_9 (1 ♂, 1 ♀), 2016_2 (1 ♂). According to LARSEN (1974: 104) the species can be encountered everywhere in the Lebanon range from sea level to the highest ranges, but it does not occur in the drier Anti-Lebanon. The species displays a local seasonal migration. Larval host is *Rhamnus* sp.

Gonepteryx cleopatra taurica (Staudinger, 1881) (Coliadinae) – 2016_13 (1 ♂). According to LARSEN (1974: 106) it is a widely distributed subspecies in Lebanon, but the numbers of the individuals are low. The larval host is *Rhamnus alaternus*.

Pieris rapae (Linnaeus, 1758) (Pierinae) – 2016_2 (2 ♂♂). It is also a common and widely distributed species in Lebanon (LARSEN 1974: 89). The larva is a serious pest in gardens and plantations, especially on *Brassica*.

CONCLUSIONS

Even a very brief visit of non-lepidopterist entomologists in the Lebanon range was successful in recording 13 butterfly taxa, amongst them four Lycaenidae

endemic to the Levant region: *Plebejus nichollae* (Figs 10–11), *Polyommatus antiochenus* (Figs 18–21), *P. ellisoni* (Figs 16–17) and *P. isauricoides* (Figs 22–23). In the subsequent year 2016 another 17 species were recorded with further Levant endemic (*Plebejus bassoni*) (Figs 6–7) or rare (*Plebejus idas selda*) (Figs 8–9) lycaenid species. And even this small material poses questions which hitherto remain unanswered, for example the phenomenon of highly polymorphic females of *Polyommatus amandus anthea* (Figs 12–15). This testifies that almost any focused and specialised trip in Lebanon can guarantee significant results for entomofaunistic knowledge of the region, with special regard to the most interesting elements of its biodiversity.

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