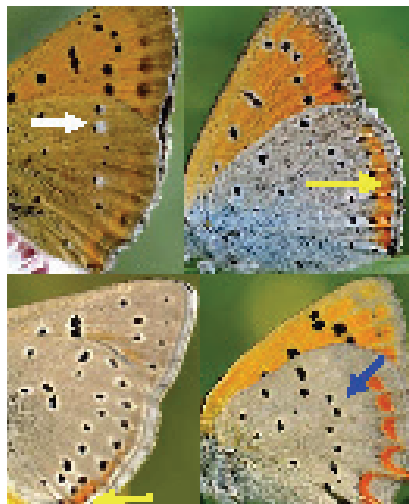
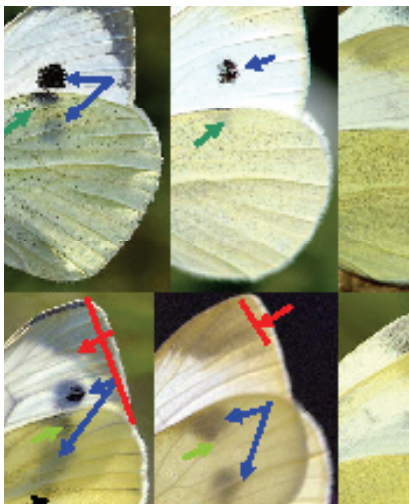


A Photographic Guide

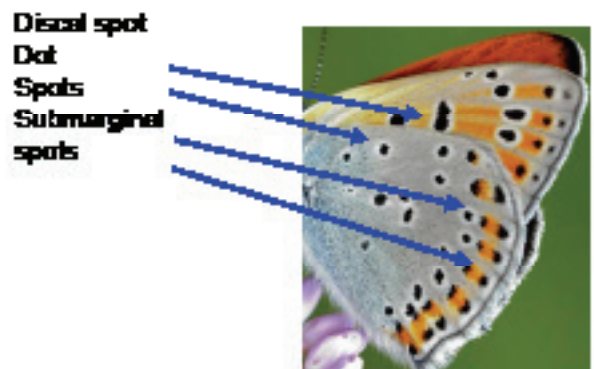
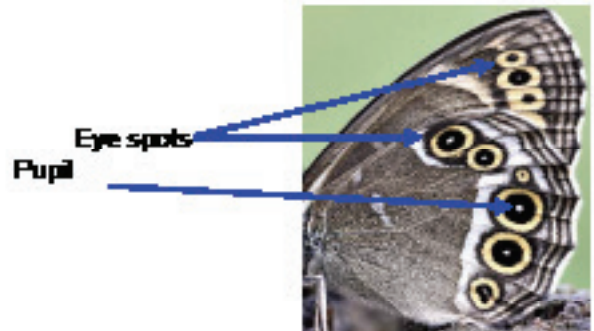
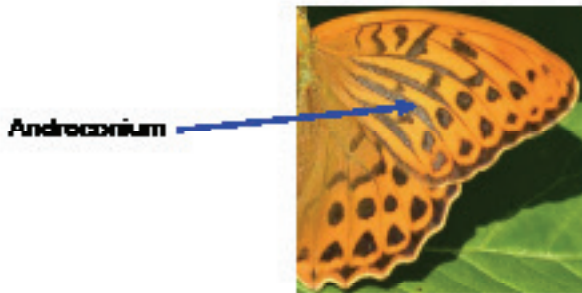
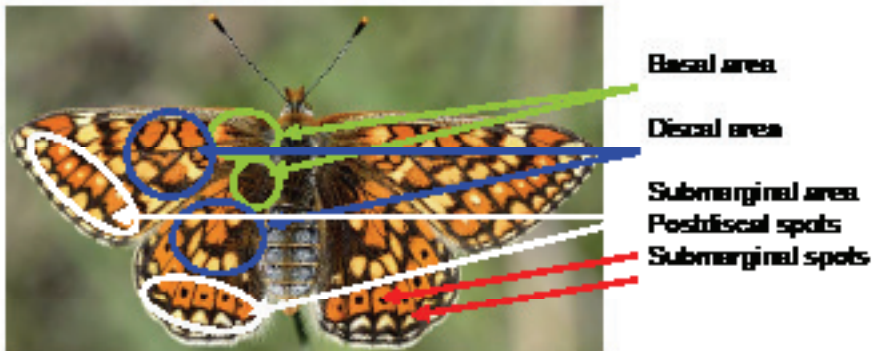
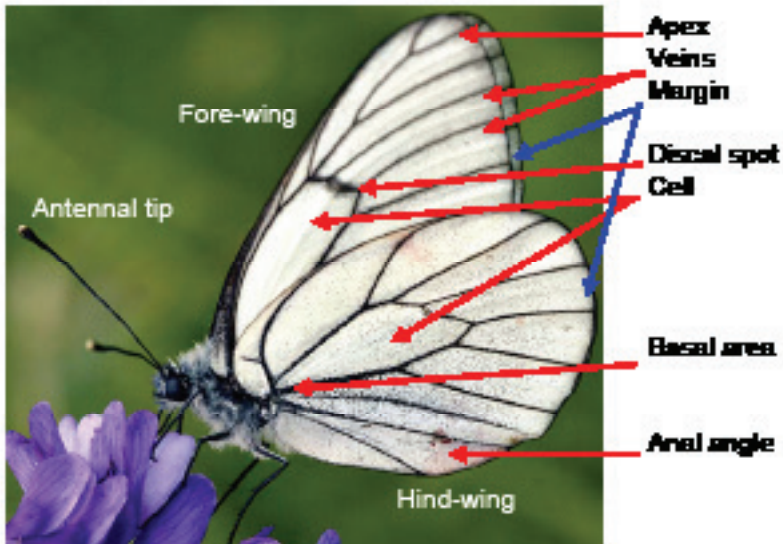
BUTTERFLIES

of Central Europe & Britain



Peter Gergely





BUTTERFLIES

of Central Europe & Britain:

a photographic identification guide

Peter Gergely

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Preface

Butterflies have enchanted people for a long time. Even for laymen and -women, butterflies are among the most charming animals. However, across Europe, these spectacular creatures are declining. Many countries have experienced the extinction of several species. They are currently being threatened by a wide variety of factors: urbanisation, exploitation of forests, draining of wetlands, changing farming methods and climate change.

Butterflies are not only fascinating creatures, they are also sensitive bioindicators that react quickly to changes in the environment. These changes are mainly caused by us, humans. Since butterflies are easily observed, they can help us monitor environmental changes and help us understand their causes. environmental change. Any decrease in the numbers and species in a given area truly reflects the deterioration of the environment, not only for butterflies but also possibly for many other insects. However, identification of butterflies in the field is not easy. The aim of this photographic guide is helping identification of butterflies in the field. It includes 269 species occurring in Britain, Western and Central Europe:



How to use this book?

- In most instances, butterflies can easily be identified from photos (pages 31-76). If not, the first part of this guide should be used, where the family or subfamily of the specimen can be identified. Differentiation down to species level is covered in the second part of the guide. There are many species where features of either the upper or underside, or both, are required for exact determination. And there are a few where exact determination is based only on the genitals and/or molecular diagnostics.
- The photos do not show the original size, small butterflies seem much larger, while very large ones seem smaller. Sizes are given as a range on a simple scale as follows: very large (like a Common Swallowtail), large (like a Peacock), medium (like a Queen of Spain Fritillary), small (like a Common Blue) or very small (like a Small Blue) according to *Haahtela et al (2011)*.
- The photographs are all taken in the field and show the butterflies in their natural position.
- While the majority of photos have been taken by the author (PG), I am grateful to the other photographers for contributing to this book, in particular to Tamás Hapka, Tamás Hudák (<https://www.flickr.com/photos/thomasz9>), Matt Rowlings (<http://www.eurobutterflies.com>) and Ervin Szombathelyi (<http://www.flickr.com/photos/antiopa>). Special thanks are due to the photographers of Saxifraga (<http://www.freenatureimages.eu>) and of Wikimedia Commons. A detailed list of photographers is shown on page 77.
- This guide helps identify butterflies. For beginners, it is advisable to start identifying with the first part (Families and Subfamilies). If we have found the family/subfamily, we can continue with the second part.

Peter Gergely



Vlinderstichting

The Vlinderstichting is an organization where its main purpose is to preserve and restore butterflies and dragonflies in the Netherlands and Europe. Since 1983 the Butterfly Research Foundation of the Netherlands has been working on a combination of research, information and education, promoting butterfly and dragonfly conservation. In Vlinderstichting, several professionals create every year conservation projects involving local and national strategies. The core of Vlinderstichting is its volunteer network that monitor butterflies and dragonflies in the whole country reporting results every year for research and conservation.



www.vlinderstichting.nl

Butterfly Conservation Europe (BCE)

Butterfly Conservation Europe is a partnership organisation focused on halting and reversing the decline of butterflies, moths and their habitats throughout Europe. BCE aims to prevent the extinction of any species of butterfly and moth, especially in Europe, and promote all activities and initiatives to conserve butterflies, moths and their habitats in Europe. A clear focus of the organisation is to work with a wide range of partners in Europe, both governmental and non-governmental, to implement the Conservation on Biological Diversity and to contribute to achieving the EU target of halting biodiversity loss by 2010. Butterfly organisations and friends from various countries across Europe are partners of Butterfly Conservation Europe.



www.bc-europe.eu

European Butterfly Group (EBG)

European Butterfly Group promotes the enjoyment, conservation and study of butterflies, moths and their habitats in Europe. European Butterflies Group aims to build up contacts with partners in Europe and provide opportunities for self-funded volunteers to do useful survey work on butterflies in Europe. EBG currently has more than 400 members and organises occasional group trips to Europe for members to do surveys. This is an opportunity for members to improve their butterfly ID skills. Membership of European Butterflies Group is only open to Members of Butterfly Conservation, due to European Butterflies Group is essentially a Branch of Butterfly Conservation (UK).



www.european-butterflies.org.uk

European Butterfly Monitoring Scheme (eBMS)

The European Butterfly Monitoring Scheme (eBMS) was formed by Butterfly Conservation Europe in April 2016 to bring together data from the different Butterfly Monitoring Schemes (BMS) of Europe into a single database. The work is coordinated by the UK Centre for Ecology and Hydrology. Butterflies in Europe have been counted by volunteers under a BMS since 1976. The method consists of counting butterflies along a fixed route called transect which is visited regularly during the butterfly flight period. Collecting proper data with BMS, it allows us to produce high-quality results, as Butterfly Indicators and butterfly population trends. Thanks to this information we will be able to promote active and accurate conservation actions for butterflies.



www.butterfly-monitoring.net

Observation Data Collection

The butterfly monitoring is an important and necessary activity to determine the status of butterfly populations and their distribution. Every person can help in collecting butterfly data with different platforms and methodologies. Making the data available is a decisive action for the improvement of conservation and research. Here we describe some useful and easy platforms where you can be part of one citizen science community and share your observations for the improvement of the conservation of butterflies and biodiversity in general.

- o ButterflyCount App (eBMS) for Apple and Android devices - www.butterfly-monitoring.net/ebms-app
- o iNaturalist www.inaturalist.org
- o Observation www.observation.org



I. Guide to Families and Subfamilies

1. Family of Skippers (HESPERIIDAE)

Small butterflies with large heads. Their colour is grey, brown or reddish brown:



Their antennae are widely separated (compared with other butterfly families, e.g. Orange Tip):



Head of a Skipper (*Charcharodus floccifera*)

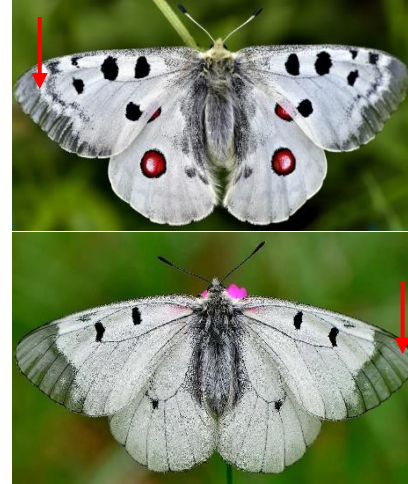


Head of Orange Tip (*Anthocharis cardamines*)

2. Family of Apollos, Festoons and Swallowtails (PAPILIONIDAE)

2.1 Parnassiinae Subfamily (Apollos)

The outer margins of forewings are transparent (red mark). Large-very large butterflies:

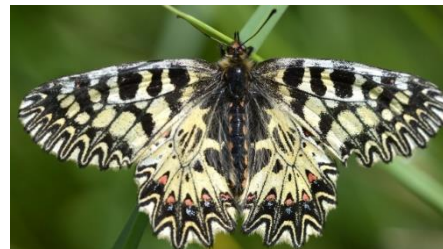


Apollo (*Parnassius apollo*)

Clouded Apollo (*P. mnemosyne*)

2.2 Papilioninae Subfamily

Large or very large butterflies. Their colour is yellow or yellowish, they have a long tail on the hind-wings or the wings are scalloped:



Festoon (*Zerynthia polyxena*)



Common Swallowtail (*Papilio machaon*)



Scarce Swallowtail (*Iphiclides podalirius*)

3. Family of Whites and Yellows (PIERIDAE)

3.1 *Coliadinae* Subfamily (Yellows)

Yellow or yellowish butterflies of medium or large size:



Colias-species

Gonepteryx-species

3.2 *Dismorphiinae* Subfamily

Medium or small sized, slow flying butterflies with elongated forewings:



Leptidea-species

3.3 *Pierinae* Subfamily

White or whitish, medium or large sized butterflies. Their undersides are yellowish, grey or greenish:



Pieris-species

Black-veined White (*Aporia crataegi*)

Translucent wings with dark veins:



➤ Hindwing undersides are marbled with olive or greyish colour:



Pontia-species



Anthocharis-species



Euchloe-species

4. Family of Metalmarks (RIODINIDAE)

Duke of Burgundy (*Hamearis lucina*) is the sole representative of this family:



5. Family of Blues, Coppers and Hairstreaks (LYCAENIDAE)

5.1 *Lycaeninae* Subfamily (Coppers)

Small sized, red, purple or brown butterflies:



Large Copper
(*Lycaena dispar*)



Purple Shot Copper
(*L. alciphron*)



Sooty Copper
(*L. tityrus*)

They have spots in row(s) on the undersides (yellow mark):

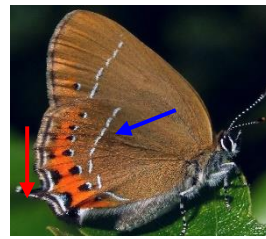


Lesser Fiery Copper
(*L. thersamon*)

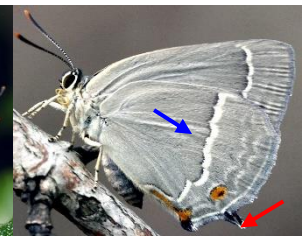
Small Copper
(*L. phlaeas*)

5.2 *Theclinae* Subfamily (Hairstreaks)

Small butterflies. They have short tails (red mark) and a white band, or its remnant, (blue mark) on the hind-wing underside. Their undersides are brown, grey or green:



Black Hairstreak
(*Satyrium pruni*)



Purple Hairstreak
(*Neozephyrus quercus*)



Green Hairstreak (*Callophrys rubi*)

Green Hairstreak has only remnants of the white band and the tail.

5.3 *Polyommatae* Subfamily (Blues)

The majority of males are blue/bluish, and the majority of females are brown or sooty brown. Some males are brown and some females are blue or flushed by blue scales.

Blue males, e.g.:



Common Blue
(*Polyommatus icarus*)



Silver-studded Blue
(*Plebejus argus*)



Scarce Large Blue
(*Maculinea teleius*)



Chalk-hill Blue
(*Polyommatus coridon*)

Brown females, e.g.:



Reverdin's Blue
(*Plebejus argyrognomon*)



Common Blue
(*Polyommatus icarus*)

Example for brown male, blue female:



Geranium argus
(*Aricia eumedon*)

Common Blue
(*Polyommatus icarus*)

They have one or more rows of spots on their undersides:



Chequered Blue
(*Scolitantides orion*)

Holly Blue
(*Celastrina argiolus*)



Damon Blue
(*Polyommatus damon*)

Reverdin's Blue
(*Plebejus argyrognomon*)

Or the underside is marbled:



Lang's Short-tailed Blue
(*Leptotes pirithous*)

6. Family of Fritillaries, Admirals, Emperors, Gliders, Browns and Heaths (NYMPHALIDAE)

Larger, brown or orange coloured butterflies.

6.1. *Libytheinae* Subfamily

They have very long palps (yellow mark), much longer than their head:



Nettle-tree Butterfly (*Libythea celtis*)

6.2 *Limenitinae* Subfamily

Sooty brown or black, medium-sized or large butterflies with white stripes. Undersides are rusty brown with white stripes:



Limenitis-species



Neptis-species

6.3 *Heliconiinae* subfamily (Fritillaries)

Orange/rusty coloured butterflies with black or sooty markings and varying sizes:



Argynnis – large

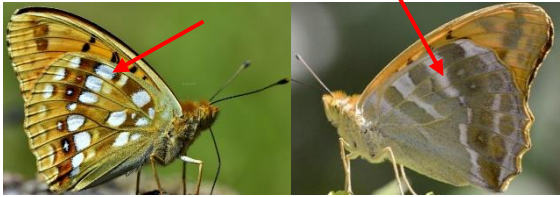
Brenthis – small/medium



Issoria – medium

Boloria – small

Some species display silver spots or bands on their undersides (red mark):



High Brown Fritillary
(*Argynnis adippe*)

Silver-washed Fritillary
(*Argynnis paphia*)

Other species do not:



Marbled Fritillary
(*Brenthis daphne*)

Twin-spot Fritillary
(*Brenthis hecate*)

6.4 Apaturinae Subfamily (Emperors)

Brown or black coloured with white or yellow bands. Males display blue/purple iridescence:



Lesser Purple Emperor (*Apatura ilia*)

6.5 Nymphalinae Subfamily

6.5.1. *Euphydryas*-species: orange or dark brown/black butterflies with light (white, yellow or orange) bands:



Scarce Fritillary (*E. maturna*)



Marsh Fritillary (*E. aurinia*)



Cynthia's Fritillary (*E. cynthia*)

6.5.2 *Melitaea*-species: orange/brown butterflies with dark markings:

Heath Fritillary
(*M. athalia*)

Glanville Fritillary
(*M. cinxia*)



Spotted Fritillary male
(*Melitaea didyma*)

female

Their underside is mottled with dark and yellow/orange bands:



Heath Fritillary
(*M. athalia*)

Glanville Fritillary
(*M. cinxia*)



Spotted Fritillary
(*Melitaea didyma*)

**6.5.3 *Araschnia*-, *Aglais*-, *Nymphalis*-,
Vanessa, *Polygonia*-species:**

Large or medium sized, striking coloured butterflies. Their concave (green mark) forewing is pointed (red mark). These are less marked in the Map Butterfly (*A. levana*) and Painted Lady (*V. cardui*):

These characteristics are best seen on their undersides:



Camberwell
Beauty
(*Vanessa
antiopa*)

Map Butterfly
(*Araschnia
levana*)

Painted Lady
(*Vanessa
cardui*)



Camberwell Beauty
(*Vanessa antiopa*)



Map Butterfly
(*Araschnia levana*)



Painted Lady
(*Vanessa cardui*)

6.6 *Charaxinae* Subfamily

Very large butterflies with two tails on their hindwings (only one species):



Two-tailed Pascha (*Charaxes jasius*)

6.7 *Danainae* Subfamily

Very large butterflies, their wings are orange with black and white markings. Their head and thorax is black with white spots:



Monarch (*Danaus plexippus*)

6.8 Satyrinae Subfamily (Heaths, Browns, Graylings and Ringlets)

6.8.1 Heaths (*Coenonympha* species)

Small, brown butterflies with eyespots on their undersides:



Chestnut Heath
(*C. glycerion*)

Small Heath
(*C. pamphilus*)

6.8.2 *Pyronia*, *Maniola*, *Hyponephele*, *Kirinia* and *Aphantopus* species

Brown-rusty brown coloured butterflies with one or more eye-spots with white pupils:

a) *Pyronia* species display a large black eyespot with two white pupils (yellow mark):



Gatekeeper (*Pyronia tithonus*)

b) *Maniola* and *Hyponephele* species

Brown butterflies, females have orange-rusty brown spots on their fore-wings. They display one (or two in *Hyponephele* females) black eye-spot in their fore-wings:



Meadow Brown (*Maniola jurtina*)

female

male



M. jurtina male

H. lycaon female

c) *Kirinia* species

Their hindwings are scalloped (red mark)



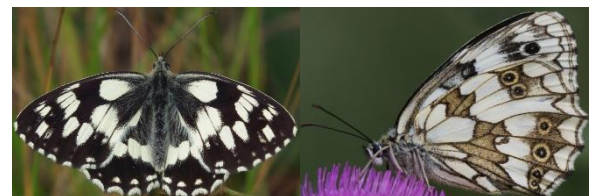
Lesser Lattice Brown (*K. climene*)

d) Ringlet (*Aphantopus hyperanthus*):



6.8.3 Whites (*Melanargia* species)

White or yellowish coloured with conspicuous black markings:



Marbled White (*M. galathea*)

6.8.4 Ringlets (*Erebia* and *Proterebia* species)

Dark brown/sooty brown butterflies, the majority has orange spots and black eye-spots with white pupils:



Woodland Ringlet (*E. medusa*)



Dalmatian Ringlet (*P. afra*)

6.8.5 *Pararge*, *Lasiommata*, *Lopinga*, *Minois*, *Satyrus* species

Medium-sized or large, brown or sooty brown butterflies with eye-spots.

a) Speckled Wood (*Pararge aegeria tircis*)



b) *Lasiommata* species

Large, rusty brown, brown or sooty brown butterflies, with one large eye-spot on their forewings and smaller on their hind-wings:



Large Wall Brown (*L. maera*)



Wall (*L. megera*)

c) Woodland Brown (*Lopinga achine*)



d) Dryad (*Minois dryas*) and Great Sooty Satyr (*Satyrus ferula*)

Large or very large, sooty brown butterflies with black eye-spots with light pupils:



Dryad (*M. dryas*)

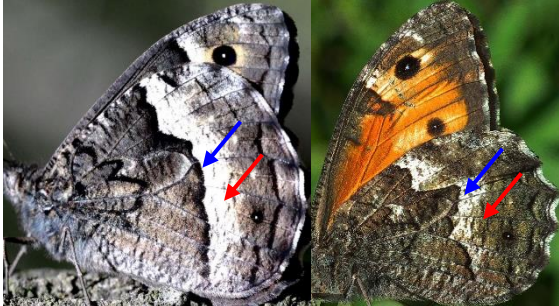


Great Sooty Satyr (*S. ferula*)

e) *Hipparchia*, *Arethusana*, *Brintesia*, *Chazara*, *Pseudochazara* and *Oeneis* species

- There is a conspicuous transversal band (blue mark) with an adjacent light band (red mark) in the middle of the hind-wing underside:

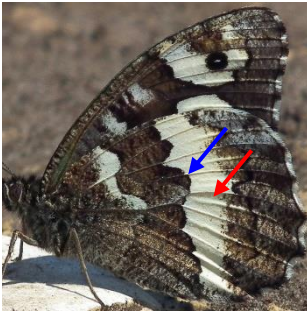
***Hipparchia* species:**



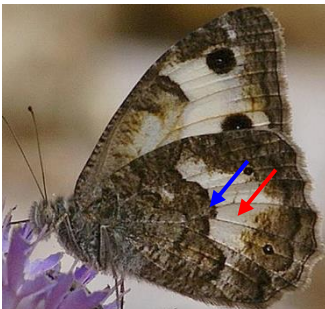
Woodland Grayling
(*Hipparchia fagi*)

Grayling
(*H. semele*)

Great Banded Grayling (*Brintesia circe*):



White-banded Grayling (*Pseudochazara anthelea*):



- The transverse band is less conspicuous on **False Grayling (*Arethusana arethusana*)** and **Hermit (*Chazara briseis*)**



False Grayling
(*Arethusana arethusana*)

Hermit (*Chazara briseis*)

- Similarly, the transverse band is less conspicuous on ***Oeneis* species:**



Baltic Grayling
(*O. jutta*)

Alpine Grayling
(*O. glacialis*)

II. Guide to Species

Skippers (HESPERIDAE)

1. Dingy Skipper (*Erynnis tages*)

E. tages is easily recognizable, cannot be confused with other skippers.



E. tages

2. Marbled Skippers (*Carcharodus* species): **Marbled Skipper (*C. lavatherae*), Tufted Marbled Skipper (*C. floccifera*), Mallow Skipper (*C. alceae*), Oriental Marbled Skipper (*C. orientalis*), and Southern Marbled Skipper (*C. baeticus*)**

The **upperside** of *C. lavatherae* is olive-brown, and there is a row of white spots across the centre of hind-wings (red mark); there are triangular white spots around the outer margin (yellow mark).

C. floccifera is greyish-brown, there are 2-3 yellow spots on the hind-wings (red mark).

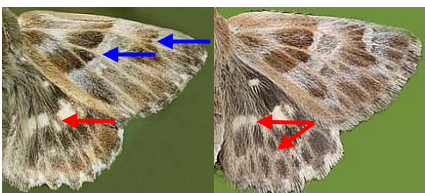
C. alceae is brown with pink or purple tinge with no white spots on hind-wings.



C. lavatherae *C. floccifera* *C. alceae*

C. orientalis is similar to *C. floccifera*, with striking transparent spots (blue mark) on fore-wings. The arc of white spots on hind-wings (red mark) is more prominent than that on *C. floccifera*.

C. baeticus is greyish-brown with two well-defined light bands (red marks) on the hind-wings, the outer one is wavy. [*C. baeticus* Rambur, 1939 is a western species, previously mentioned in Dalmatia, but it is excluded from current Croatian species lists].



C. orientalis *C. baeticus*

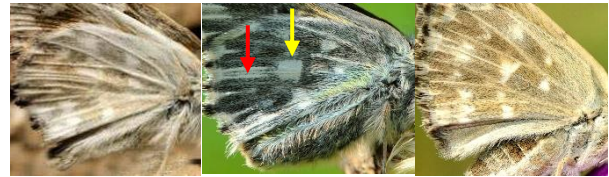
The **underside** of *C. lavatherae* is pale grey with some greenish tint, spots are faint.

C. floccifera is dark grey with readily visible spots, in particular the postdiscal spot is striking (yellow mark), and along the m_2 vein, a long white streak (red mark) extends to the margin.

C. alceae is brown/greyish-brown with visible white spots but no white streak.

C. orientalis is pale brown (not dark grey as *C. floccifera*), spots and white bands are less striking.

C. baeticus is pale brown or yellowish-brown, with white bands, including a wavy outer band (red mark), veins are light-coloured.



C. lavatherae *C. floccifera* *C. alceae*



C. orientalis *C. baeticus*

**3. Red Underwing Skippers (*Spialia* species):
Orbed Red Underwing Skipper (*S. orbifer*) and
Red Underwing Skipper (*S. sertorius*)**

3.1 Differentiation of *Spialia* species from *Pyrgus* species.

While their undersides are different, uppersides may look similar. The best way is to differentiate *Spialia* species by the number of postdiscal spots: they have 4 spots, while all *Pyrgus* species have 3 (red circle). The submarginal row of spots of *Spialia* is well defined (blue mark) – uncertain or missing in *Pyrgus* species .



Spialia orbifer

Pyrgus malvae

**3.2 Orbed Red-Underwing Skipper (*S. orbifer*)
and Red Underwing Skipper (*S. sertorius*)**

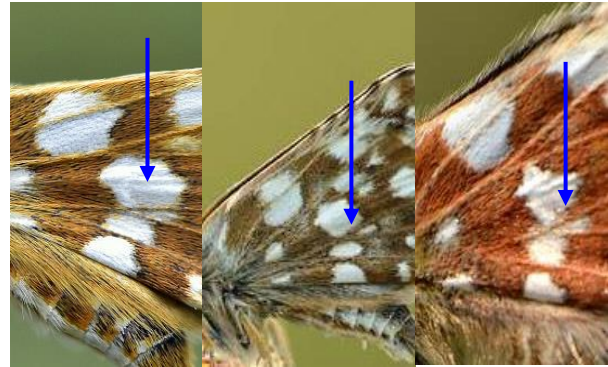
There are 7 dark stripes (red mark) in the fringe of fore-wing of *S. orbifer* – contrasting with 5-6 stripes of *S. sertorius*.



S. orbifer

S. sertorius

The **underside** of underwings of *S. orbifer* are brown or rusty-brown (a) or more frequently olive brown (b), - the white spots are large and rounded – the underside of *S. sertorius* is reddish-brown and its spots are ragged, in particular the discal s4/5 spot (blue mark).



a) *S. orbifer*

b) *S. orbifer*

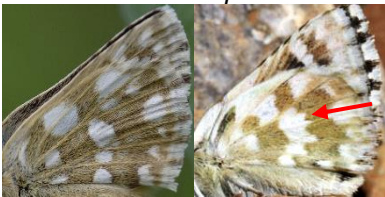
S. sertorius

3.2 Differentiation of Orbed Red-Underwing Skipper (*S. orbifer*) and Persian Skipper (*S. phlomidis*)

The ranges of *S. sertorius* and *S. phlomidis* do not overlap, however, those of *S. orbifer* and *S. phlomidis* overlap in the Southern Balkans. There is a large, white rectangular spot in the centre of hind-wing of *S. phlomidis* (yellow mark). The underside of *S. phlomidis* is olive-green (cf. olive-brown or rusty brown of *S. orbifer*) and the white discal spots form an unbroken band (red mark).



S. orbifer *S. phlomidis*



S. orbifer *S. phlomidis*

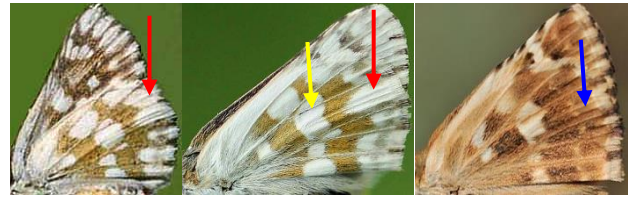
4. *Muschampia* species: Spinose Skipper (*M. cribrellum*), Tessellated Skipper (*M. tessellum*), and Sage Skipper (*M. proto*)

Muschampia species display much more and/or larger white spots on their **uppersides** than *Pyrgus* species do. Their characteristic feature is the presence of a pair of oblong spots on the fore-wings (yellow circle). The white submarginal spots are most striking on *M. tessellum*, while obscure or missing on *M. proto* (red mark). The submarginal spots on hind-wings are narrow, oblong and/or spear-shaped on *M. cribrellum*.



M. cribrellum *M. tessellum* *M. proto*

The **undersides** of *M. cribrellum* and *M. tessellum* are olive-brown with large distinct white spots (*M. cribrellum*) or bands (= confluent spots) (*M. tessellum*) (yellow mark). The border of hind-wings is white on both species (red mark). The underside of *M. proto* is brown/rusty-brown, white spots are smaller and do not form bands, the border is brown (blue mark).



M. cribrellum *M. tessellum* *M. proto*

5. *Pyrgus* species

5.1 Differentiation of *P. malvae* – *Spialia* species: see 3.2 above.

5.2 Differentiation by their upperside

P. malvae, *P. malvoides* and *P. carthami* have white spots on their hind-wings – the other species do not (sometimes *P. armoricanus* and *P. onopordi* have bright grey discal spots). The white spots on the fore-wings of *P. cacaliae* and *P. warrenensis* are small and faint.



P. malvae *P. carthami* *P. armoricanus*



P. sidae *P. onopordi* *P. serratulae*



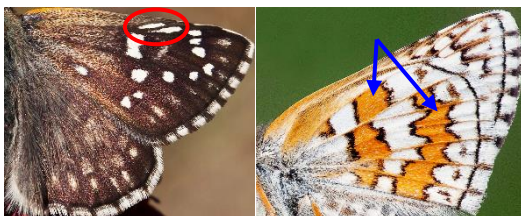
P. cirsii *P. alveus* *P. andromedae*



P. cacaliae *P. warrenensis* *P. carlinae*

5.3 Yellow-banded Skipper (*P. sidae*)

The upperside of *P. sidae* may resemble other *Pyrgus* species, e.g. *P. carthami*, but there are a couple of distinctive oblong white marginal spots on its fore-wing (red circle). The underside is diagnostic: on the hind-wings there are two black-bordered bright yellow/orange stripes (blue mark).



P. sidae

5.4 Cinquefoil Skipper (*P. cirsii*)

On the upperwings the joined postdiscal white spots form a sinuous mark (yellow circle). Not always easy to distinguish from *P. malvae*.



P. cirsii

P. malvae

The underside of *P. cirsii* is reddish with 2-3 crescent-shaped white anal spots (blue mark) - they resemble those of *P. armoricanus* (5.6), but they are located much farther from the margin. These spots are also similar to those seen on *P. onopordi* - its anvil-shaped discal spot is distinctive (5.5). The white spot above the cell (red mark) is bigger than that of *P. malvae* and not rounded. This spot forms a square on *P. armoricanus*.



P. cirsii

P. malvae

P. armoricanus

5.5 Rosy Grizzled Skipper (*Pyrgus onopordi*)

The upperside is similar to *P. malvae*. Its underside displays a unique, white anvil-shaped postdiscal spot (red mark) - this spot on the underside of *P. malvae* is most frequently resembles an oblique M (green mark), but sometimes it may mimic an anvil (yellow mark). In such a case the small size of the round, white discal spot (blue mark) is characteristic of *P. malvae*.



P. onopordi

P. malvae



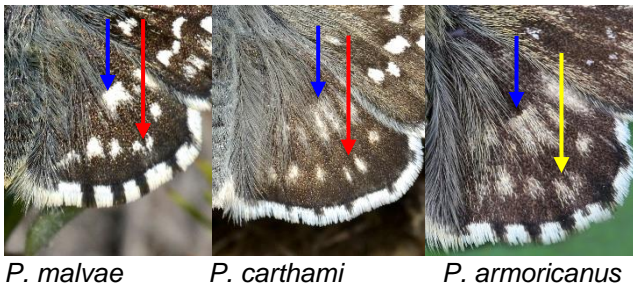
P. onopordi

P. malvae

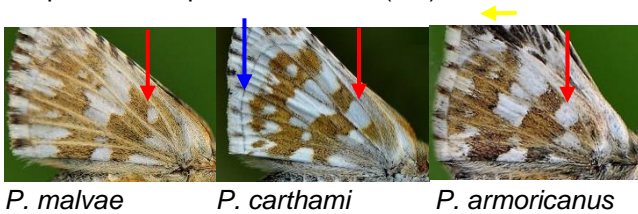
P. malvae

5.6 Grizzled Skipper (*P. malvae*), Southern Grizzled Skipper (*Pyrgus malvoides*), Safflower Skipper (*P. carthami*), and Oberthür's Grizzled Skipper (*P. armoricanus*)

P. malvae and *P. malvoides* cannot be separated externally. Both *P. malvae* and *P. carthami* have distinct white spots on their hind-wings (red mark); the spots of *P. carthami* along the outer margin are spearhead-shaped (red mark). The spots of *P. armoricanus* are grey, sometimes very faint. If they resemble those of *P. carthami*, the marginal spots are not spearhead-shaped (yellow mark). There are no white spots - only faint grey smudges - on the hind-wings of the other species (*P. serratulae*, *P. alveus*, *P. andromedae* and *P. cacaliae*).

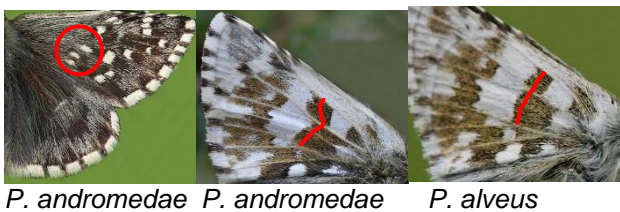


There is a small round white spot in the cell of *P. malvae* (red arrow), the brown veins are prominent - the other two species have a much larger and less rounded spot. Confluent white spots produce a pale or white border on *P. carthami* (blue mark). There are 2-3 sickle-shaped white spots at the inner margin (s1-3) of *P. armoricanus* (yellow mark). Such spots are also seen on *P. onopordi* - its anvil-shaped discal spot is distinctive (5.5).



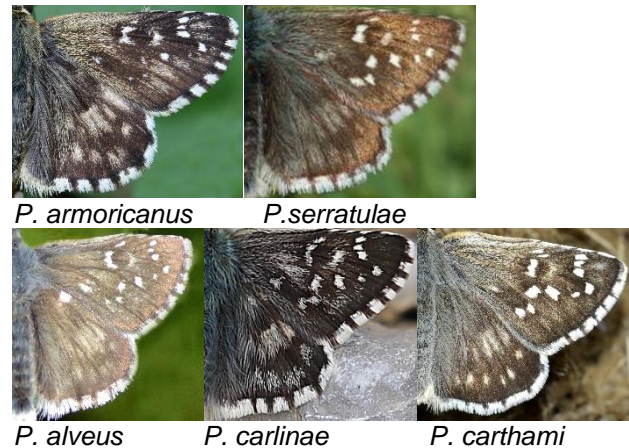
5.7 Alpine Grizzled Skipper (*P. andromedae*)

On the fore-wing, there are 3 discal white spots below the cell (red circle); grey spots are faint or absent on hind-wings. The inner border of the broad postdiscal white band is pointed (red mark) - similar to that of *P. cacaliae* (see 5.9) - while almost straight in *P. alveus* (and *P. cirsii*, *P. serratulae*, and *P. armoricanus*).

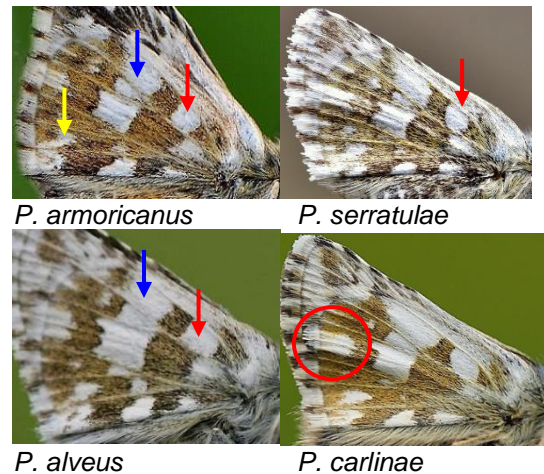


5.8 Oberthür's Grizzled Skipper (*P. armoricanus*), Olive Skipper (*P. serratulae*), Carline Skipper (*P. carlinae*) - Large Grizzled Skipper (*P. alveus*)

The **uppersides** of *P. armoricanus*, *serratulae*, *carlinae* and *alveus* are similar. The grey (not white) spots on the hind-wings of *P. armoricanus* are much more prominent than those on *P. serratulae*, *P. carlinae* and *P. alveus*. For comparison: white spots on the hind-wings of *P. carthami*.

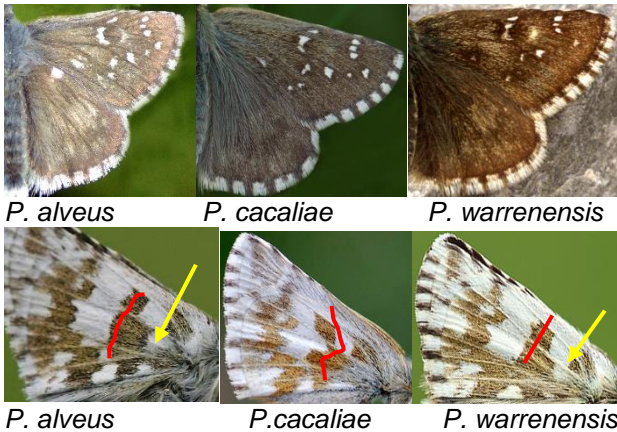


Undersides of *P. armoricanus*, *P. serratulae* and *P. alveus*: The basal white spot is rounded on *P. serratulae* (red mark) - *P. armoricanus* and *P. alveus* have a quadrangular spot. The postdiscal white spots join to a white band on *P. alveus* (blue mark). The large white spots are divided by brown veins on *P. armoricanus*. There are 2-3 sickle-shaped white spots at the inner margin of *P. armoricanus* (yellow mark). *P. carlinae* is similar to *P. alveus*, but the marginal spot in v5 is long, rectangular with a clear internal edge (red circle).



5.9 Large Grizzled Skipper (*P. alveus*) – Dusky Grizzled Skipper (*P. cacaliae*) – Warren’s Skipper (*P. warrenensis*)

These species have very small white spots on the fore-wings and no white spots on hind-wings. On the **underside**, the inner border of the broad postdiscal white band is almost straight on *P. alveus*, straight on *P. warrenensis*, and pointed (red mark) on *P. cacaliae*. *P. cacaliae* has no white spot at the base – *P. alveus* and *P. warrenensis* do have (yellow mark). Similarly, *P. serratulae*, *P. armoricanus* and *P. andromedae* also do.



5.10 Hints to *Pyrgus* species differentiation at a glance

Note, the number, size and appearance of spots on *Pyrgus* species are highly variable, therefore the 'rules' apply to the majority of specimens, but not all.

A/ Upperside

1. Distinctive white spots on hind-wings = *P. malvae*, *P. malvoides*, *P. carthami* (the hind-wings of *P. armoricanus* and *P. onopordi* may have a bright discal spot)
2. Very small white spots on fore-wings = *P. cacaliae*, *P. warrenensis* – *P. warrenensis* occurs only in the Alps
3. Oblong white marginal spots on the fore-wing = *P. sidae*
4. Sinuous postdiscal mark on fore-wing = *P. cirsii*
5. Three discal white spots below the cell on fore-wings = *P. andromedae*
6. Distinct white transverse (most frequently oblique M-shaped) discal spot on hind-wings = *P. malvae/malvoides*

B/ Underside:

1. Yellow/orange stripes on hind-wings = *P. sidae*
2. White or pale border on hind-wings = *P. carthami*
3. Small, round white basal spot on hind-wings = *P. malvae*
4. No basal white spot on hind-wings = *P. cacaliae*
5. A unique, white anvil-shaped postdiscal spot on hind-wings = *P. onopordi* (Note: *P. carthami*, *P. cacaliae* and rarely *P. malvae* also display similar spot).
6. 2-3 sickle-shaped white spots at the inner margin (located: s5-7) of hind-wings = *P. armoricanus*, *P. carthami*, *P. onopordi*, *P. cirsii* (the spots of *P. cirsii* located farther from the margin than those of the others).
7. *P. carlinae* is similar to *P. alveus*, but the marginal spot in v5 is long, rectangular with a clear internal edge.

6. Chequered Skipper (*Carterocephalus palaemon*) – Northern Chequered Skipper (*C. silvicolus*)

These two species are easily distinguishable from other skippers. Their underwings are somewhat similar, but those of *C. silvicolus* are bright yellow, while *C. palaemon* has darker wings with light rounded spots.



C. palaemon



C. silvicolus male *C. silvicolus* female

7. Large Chequered Skipper (*Heteropterus morpheus*)

The Large Chequered Skipper (*Heteropterus morpheus*) is easy to recognize even at flight, cannot be confused with the other skippers. Females have chequered fringes.



H. morpheus male *H. morpheus* female

8. Silver-spotted and Large Skipper (*Hesperia comma* and *Ochlodes sylvanus*)

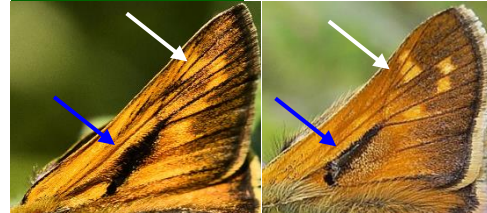
They can easily be identified by their underside. Males and females can be distinguished by the presence/absence of androconium (blue mark). *H. comma* males have a light streak (“comma”) within their black androconium (not always noticeable).



underside



upperside female



upperside male

O. sylvanus

H. comma

They can be identified by the light spots on their upperside (white mark). The spots are much lighter, more whitish on *H. comma*.

9. *Thymelicus* species: Essex Skipper (*T. lineola*), Small Skipper (*T. sylvestris*), and Lulworth Skipper (*T. acteon*)

T. lineola and *T. sylvestris* are best identified by their antennal tip: it is black underneath in *T. lineola* and orange underneath in *T. sylvestris*.



T. lineola

T. sylvestris

Males and females can be distinguished by the presence or absence of androconium (yellow mark).

The Lulworth Skipper's (*T. acteon*) antennal tip is rusty-brown (similar to Small Skipper), but Lulworth Skipper is smaller and both upperside and underside are usually darker. **Males** of *T. acteon* resemble *T. lineola*, but their antennal tip is black underneath. The marginal dark band is usually wider (red mark) and, therefore, darker veins (black mark) are less striking. Some males display light markings, similar to females, but these are less conspicuous.



T. lineola male

T. sylvestris male

T. acteon male

Females of *T. acteon* have upperside markings (white mark), similar to Large Skipper (*Ochlodes sylvanus*).



T. lineola female

T. acteon female

T. sylvestris female



T. lineola

T. sylvestris

T. acteon

10. *Gegenes* species: Pigmy Skipper (*G. pumilio*) and Mediterranean Skipper (*G. nostradamus*)

The elongated fore-wing (the angle is marked by red) is characteristic of *Gegenes* species - for comparison the fore-wing (with less acute angle) of a *Thymelicus* species (*T. sylvestris*). *G. pumilio* is smaller, its colour is dark brown with some small postdiscal spots (yellow mark) on the greyish brown underside. *G. nostradamus* is larger, its colour is greyish-brown with no spots on the underside.



G. pumilio

G. nostradamus



T. sylvestris

PAPILIONIDAE

1. Festoons (*Zerynthia* species): Southern Festoon (*Z. polyxena*) and Eastern Festoon (*Z. cerisy*)

Both Festoons are easily recognizable.



Z. polyxena *Z. cerisy*



Z. polyxena *Z. cerisy*

2. *Parnassius* species

Apollo (*P. apollo*) is easily identifiable. In the Alps, the Small Apollo (*P. phoebus*), a high-mountain species also flies. They can be distinguished by the presence of red spot(s) on the fore-wings of *P. phoebus* (yellow mark). Males of both species are smaller and have less dark suffusion.



P. apollo male *P. apollo* female



P. phoebus male

The Clouded Apollo (*P. mnemosyne*) is also easily recognizable. The spots of females are larger and they exhibit more suffusion; the presence of the sphragis (blue mark) on mated females is also of diagnostic value.



P. mnemosyne male *P. mnemosyne* female

3. Swallowtails (*Papilio* and *Iphiclides* species): Common Swallowtail (*P. machaon*), Southern Swallowtail (*P. alexanor*), and Scarce Swallowtail (*I. podalirius*)

They are also easily recognizable.



P. machaon *P. alexanor*



P. machaon *P. alexanor*



I. podalirius

PIERIDAE

1. Clouded Yellows (*Colias* species)

The uppersides of *Colias* species are rarely seen since they are sitting with wings closed. However, their colour and markings can be observed in counterlight. (Try to make photos against the light!)

1.1. Moorland Clouded Yellow (*C. palaeno*) and Mountain Clouded Yellow (*C. phicomone*)

A *C. palaeno* lives in peat bogs. Its fringes are pink, and there is a white spot on the centre of hind-wing (blue mark). *C. phicomone* is a mountain species, its colour is greenish yellow, wings are more or less dusted with grey. The white spot on the hind-wings is bordered with red (blue mark).



C. palaeno

C. phicomone

1.2 Danube Clouded Yellow (*C. myrmidone*), Clouded Yellow (*C. crocea*), Lesser Clouded Yellow (*C. chrysotheme*), and Eastern Pale Clouded Yellow (*C. erate*)

Fore-wings: Males have no light spots within the marginal band (red mark) – females do have. The upperside of *C. myrmidone* is orange, *C. crocea* is deep yellow with an orange hint, *C. chrysotheme* is bright yellow, *C. erate* is sulphur- or cadmium yellow. The marginal black band of *C. myrmidone* is narrower than that of *C. crocea* (see white marks on hind-wings). This band is divided by yellow veins on *C. chrysotheme* (red mark). The inner border of this band is obtuse-angled (red mark) on *C. erate* – the others' are slightly curved.



C. myrmidone

C. crocea

C. chrysotheme

C. erate

Differentiation of **females** is difficult. They all have light spots within the black apical band, which extends to the anal angle of the fore-wing – on *C. hyale* and *C. alfacariensis* this band turns to be narrow at the anal angle (white mark).



C. croceus

C. erate

C. alfacariensis

Females are generally yellow/orange or sulphur-yellow (*C. erate*), but sometimes they are almost white.



C. myrmidone

C. crocea

C. erate

C. chrysotheme

The marginal band on the **hind-wings** of *C. myrmidone* is narrower than that of *C. crocea*, with much more light spots (red mark). Their light spots are large and well differentiated – these spots are blurred on *C. chrysotheme* (more spots than band) (red mark). *C. erate* females are easily differentiated by their lemon-yellow colour, their light spots are also blurred (blue mark). White-coloured females can be identified according to these spots. Important, *C. erate* and *C. crocea* hybrids may appear in various intermediate forms, they are difficult to identify.

1.3 Differentiation of Pale Clouded Yellow (*C. hyale*) and Berger's Clouded Yellow (*C. alfacariensis*)

The differentiation of *C. hyale* from *C. alfacariensis* is difficult (only the larvae are easily separable). Both males have light spots in their black marginal band. The colour of their uppersides is sulphur- or lemon-yellow – *C. alfacariensis* males display a brighter yellow. The form of the fore-wings is perhaps the best way to separate these two species: the apex of *C. hyale* is acute and rounded of *C. alfacariensis*, the outer margin is more or less straight (*C. hyale*) or rather convex (*C. alfacariensis*). However, the form of fore-wing, depending on the angle of making the photo, may be deceptive.



C. hyale

C. alfacariensis

A further feature is the different habitats of these species that *C. alfacariensis* lives in dry, rocky places where its host plants *Hippocrepis comosa* or *Coronilla varia* grow.



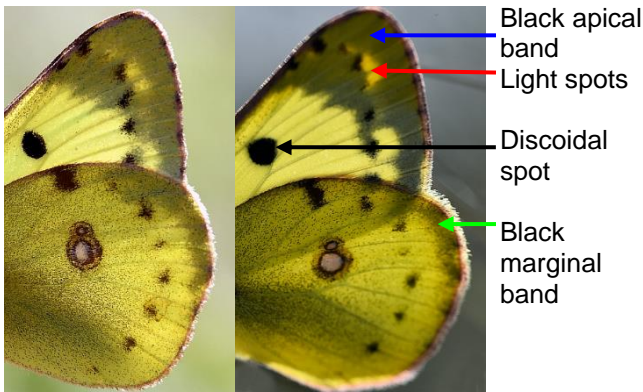
Hippocrepis comosa

C. hyale occurs rather in lowland at flowery, grassy places, commonly associated with lucerne (alfalfa) under cultivation (host plant).

These two species are highly variable. Determination is based usually on prepared specimens. The following criteria [Mérit & Mérit, 2000] is also made rather for prepared specimens, but it offers a head-to-head comparison of features. The majority of these criteria, in particular those observed on the uppersides, cannot be recognized in the field.

Criteria	Score	<i>Colias hyale</i> (+)	<i>Colias alfacariensis</i> (-)
Fore-wings:			
Apex	3	Acute	Rounded
Margin	3	Straight	Convex
Upperside colour	3	Greenish yellow – light yellow, less uniform	Uniform yellow
Underside	1	Whitish, with little contrast	Bright yellow, with strong contrast
(Red) colour of antennae, legs and edge of wings	2	Less bright	Bright
Basal suffusion (upperside)	2	Extensive (extends until the base of the wing)	Limited to the area below the cell
Discoidal spot	→ 1	Less developed	Greater
Light submarginal spots	→ 1	Complete	Reduced
Black marginal band	→ 1	Complete, continuous	Often incomplete and fragmented
Hind-wings:			
Basal suffusion	1	Extensive	Less extensive
Discoidal spot (upperside)	2	Pale and small	Large bright, orange
Light submarginal spots	1	Frequently seen and in large numbers	Rare and their number very limited
Black marginal band	1	Often present (duplex)	Often barely marked
Biotope		Flowering meadow	Dry and rocky terrain
<i>Hippocrepis comosa</i> present		---	+++ (host plant)
SUM	22	+ 22	-22

How do these criteria work? If the wings of the specimen is pointed/acute (+3) and the margin is straight (+3), the score is +6, if rounded (-3) and convex (-3), the score is -6. More scores suggest *hyale*, less scores *alfacariensis*. The specificity was calculated 99% by the authors, sensitivity is not known.



C. hyale

C. alfacariensis

Males and females of *C. hyale* and *alfacariensis* usually can be identified by the colour of their wings. The colour of male *C. hyale* is bright yellow, the colour of female is lighter with greenish tint. The male *C. alfacariensis* is also brighter yellow, the female is lighter.



C. hyale male (above) and female

1.4 Differentiation of Danube Clouded Yellow (*C. myrmidone*), Balkan Clouded Yellow (*C. caucasica*) and Clouded Yellow (*C. croceus*)

The distribution of *C. myrmidone* and *C. caucasica* does not overlap, therefore, their simultaneous occurrence is unlikely. The colour of *C. caucasica* is much darker with a reddish tint. Similar to *C. myrmidone*, males have no spots in the black marginal band.



C. myrmidone male

C. croceus male

C. caucasica male

The light spots of females are more prominent and they are clearly distinguishable on the underwings of *C. myrmidone*. Similar to males, the colour of *C. caucasica* is much darker with a reddish tint (usually not noticeable with wings closed!)



C. myrmidone female

C. croceus female

C. caucasica female

2. *Gonepteryx* species: Brimstone (*G. rhamni*), Powdered Brimstone (*G. farinosa*), and Cleopatra (*G. cleopatra*)

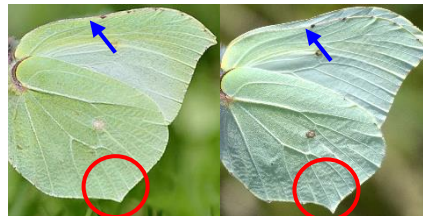
Male *G. cleopatra* is easily distinguishable with its orange flush on the fore-wing.



G. rhamni male

G. cleopatra male

However, *G. cleopatra* female is similar to *G. rhamni*; the only difference is the angular projection at v_3 (red circle): it is shallow on *G. cleopatra*, and prominent on *G. rhamni*. The fore-wing costa of *G. cleopatra* female is also less concave (blue mark).



G. cleopatra female

G. rhamni female

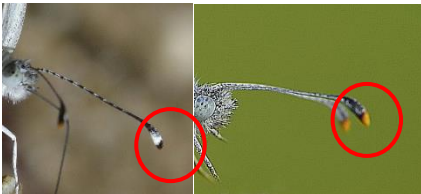
3. Wood Whites (*Leptidea* species)

Within the Wood White species complex, *L. sinapis*, *L. reali*, *L. juvernica* cannot be distinguished by their appearance. Only Fenton's Wood White (*L. morsei*) can be separated from this species complex. Unfortunately, Wood Whites always rest with wings closed, therefore the marks on the uppersides cannot be seen. The apex of the fore-wing of *L. morsei* is slightly falcate at m_1 (red mark); this is most prominent in the first brood.



L. morsei *L. sinapis* (complex)

The colour and marking of hind-wings are highly variable, less useful for identification, though more striking greyish veins are thought to be characteristic to *L. morsei* 1. brood. A further discriminative feature of *L. morsei* is its different biotope (woodland) and characteristic (more powerful) flight. *L. duponcheli* is easily distinguished by its antennal club: it is dark grey and brown with no white underside – there is a white patch (red mark) on the antennal club of *L. sinapis* complex.



L. sinapis *L. duponcheli*

4. Black-veined White (*Aporia crataegi*)

Black-veined Whites are easy to identify even at flight.



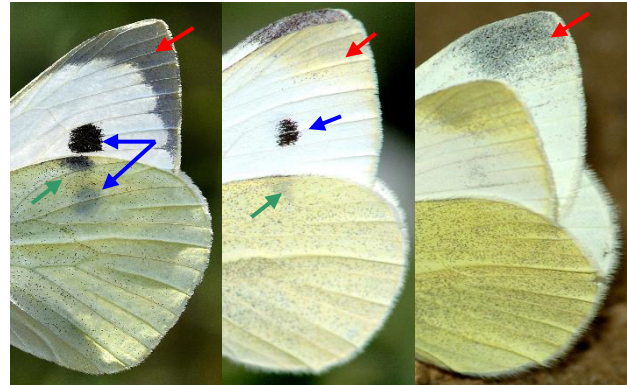
A. crataegi

5. Whites (*Pieris* species)

5.1 Large White (*P. brassicae*), Small White (*P. rapae*), and Mountain Small White (*P. ergane*)

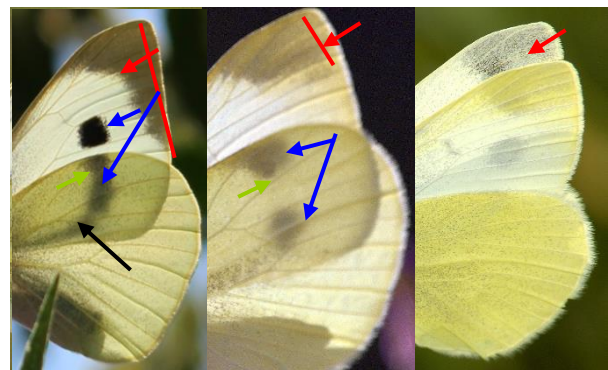
P. brassicae and *P. rapae* are easily distinguishable, *P. brassicae* is much larger. *P. ergane* is even smaller than *P. rapae* with much more yellow colour on the wings, its spots are fainter.

The large black apical spot (red mark) on *P. brassicae* **males** extends along the outer margin – much farther than that of *P. rapae*. The apical spot of *P. ergane* is faint, grey (hardly seen on the underwing) and not triangular but rather quadrangular. There are two postdiscal large round black spots on the fore-wings of *P. brassicae* (blue marks). The black spots are less striking on *P. rapae* males – they often have only one spot. They are even fainter, or missing (1st brood) on *P. ergane*. *P. brassicae* has a distinct black spot on the upper margin of underside of hind-wings (green mark). There are no such spots on the hind-wings of the other two species, but the spot on the upperside may appear through.



P. brassicae male *P. rapae* male *P. ergane* male

P. brassicae **females** also display a distinct black apical spot, which is smaller and shorter on *P. rapae* (red mark). This spot is faint and quadrangular on *P. ergane* (but larger than that of males). The postdiscal spots are readily visible on both *P. brassicae* and *P. rapae* (blue marks). *P. brassicae* females also have a black streak below the 2nd postdiscal spot (black mark); *P. rapae* and *P. ergane* have only grey suffusion (that does not appear through)



P. brassicae female *P. rapae* female *P. ergane* female

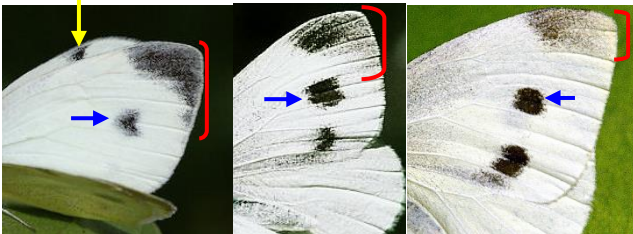
The black streak (black mark) on *P. brassicae* female, and the faint suffusion on *P. rapae* female:



P. brassicae female *P. rapae* female

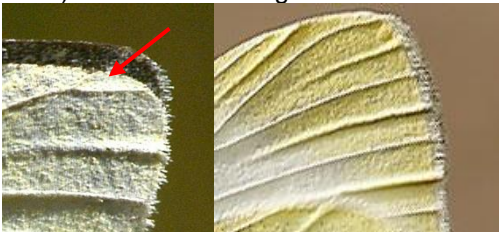
5.2 Differentiation of Southern Small White (*P. mannii*)

The size of *P. mannii* is similar to *P. rapae*. The black apical spot of *P. mannii* is larger and extends at least to the black postdiscal spot (i.e. the end of cu_1 vein) (red mark). Its postdiscal black spot is larger and either quadrangular or concave (blue mark). The costal black spot on the hind-wing is strong, triangular (not blunt as on *P. rapae*) (yellow mark).



P. mannii male *P. mannii* female *P. rapae* female

Another feature, seen only on undersides: the end of vein 7 of fore-wing apex is forked in *P. rapae* (red mark). However this might not be consistent.



P. rapae *P. mannii*

5.3 Green-veined White (*P. napi*), Dark-veined White (*P. bryoniae*), and Balkan Green-veined White (*P. balcana*)

These species are best differentiated from the other Whites according to their suffused veins. The veins on the underwings of *P. napi* are suffused with olive green/grey, while those of *P. bryoniae* are much darker (dark grey or almost black). The veins of *P. bryoniae* are suffused also on the upper side of wings forming even dark stripes. *P. balcana* closely resembles *P. napi*, but the suffusion on the underwings is less defined.



P. napi *P. bryoniae* *P. balcana*

The characteristic feature of *P. napi*, *P. balcana* and *P. bryoniae* is their suffused veins on their **underside**. Suffusion on the hind-wings of other Whites (*P. rapae*, *P. ergane*, *P. mannii* – see below) is dispersed, not associated with the veins.



P. rapae *P. ergane* *P. mannii*

The differentiation according to their **upper side** is also easy. The form of the apical black spot is the best way to differentiate *P. napi* (and *P. balcana* and *P. bryoniae*) from the other Whites. The apical spot of *P. brassicae* is large, extending well below the postdiscal spot. The spot is smaller and extending less of *P. rapae* and *P. ergane*. The spot of *P. napi* (and *P. balcana* and *P. bryoniae*) is disrupted and consists of small black triangles at the end of veins



P. brassicae male *P. rapae* male *P. napi* male



P. brassicae female *P. rapae* female *P. napi* female

6. Eastern Bath White (*Pontia edusa*) and Peak White (*P. callidice*)

These species are easily identifiable, both uppersides and undersides are different.



P. edusa *P. callidice*



P. edusa *P. callidice*

7. Orange Tip (*Anthocaris cardamines*), Eastern Orange Tip (*A. damone*), Gruner's Orange Tip (*A. gruneri*), and Eastern Dappled White (*Euchloe ausonia*)

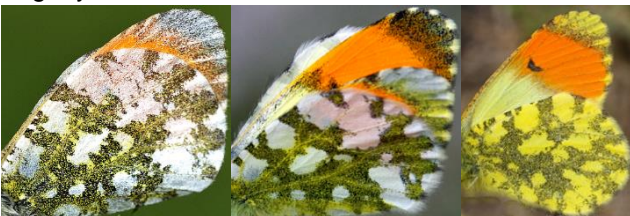
The upperside of **male** Orange Tips is white and orange tips: *A. cardamines* is white, *A. gruneri* is light yellow, *A. damone* is bright yellow.

The discal spot (blue mark) is small on *A. cardamines*, suffused on *A. gruneri*, linked with a suffused costa (black mark), and large, sharply defined on *A. damone*.



A. cardamines male *A. gruneri* male *A. damone* male

The olive-green marbled mark on the hind-wing underside is more confluent and darker on *A. gruneri*. The hind-wing undersides of *A. damone* are bright yellow.



A. cardamines male *A. gruneri* male *A. damone* male

The discal spot is small on *A. cardamines* **female** (blue mark), large and suffused on *A. gruneri* female (blue mark); its underside is darker and the spots

are more confluent. The colour of *A. damone* is yellowish, the discal spot is sharply defined.



A. cardamines female *A. damone* female
A. gruneri female

The olive-green marbled mark on the hind-wing underside is more confluent and darker on *A. gruneri*. The hind-wing undersides of *A. damone* are bright yellow.



A. cardamines female *A. damone* female
A. gruneri female

E. ausonia resembles *A. gruneri* female, but its black apical spot is mixed with white spots (green mark), the discal spot is large, distinct, not suffused (blue mark). The marbled underside is yellowish-grey or olive-green and the apex is also marbled (red mark).



E. ausonia

RIODINIDAE

1. Duke of Burgundy (*Hamearis lucina*)

Both sides are characteristic, this butterfly is easily identified.



H. lucina

Coppers, Hairstreaks and Blues (LYCAENIDAE)

1. Coppers (*Lycaena* species)

1.1 Small Copper (*L. phlaeas*)

L. phlaeas is easily identifiable. Fore-wings are coppery-red or orange (2nd brood is more sooty) with large black spots. Hind-wings are dark brown with a broad, orange marginal band (yellow mark). Undersides are brownish-grey with small black dots and a wavy red submarginal line (white mark).



L. phlaeas male *L. phlaeas* female

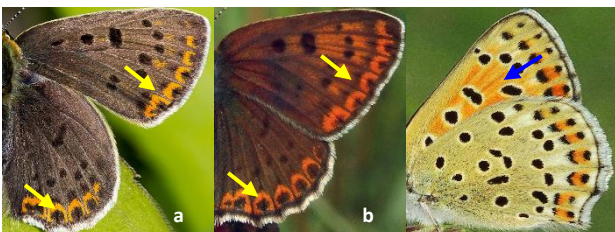
1.2 Sooty Copper (*L. tityrus*)

L. tityrus **male** is easily identifiable. Its colour is sooty brown with some violet or greenish iridescence. Fore-wing black postdiscal spot is well defined (other small black spots may also be seen). The orange submarginal band is either absent or present – never as striking as on females (yellow marks). Underside is yellowish-grey with black spots, the orange submarginal spots are present on both wings. The **underside** of the fore-wing (blue mark) is grey (yellow/orange on females).



L. tityrus male

L. tityrus **females** are highly variable: a) similar sooty brown as males but with bright orange submarginal bands (yellow marks), or b) brown and red with black spots on fore-wings and with bright orange submarginal bands. **Underside** is yellowish-grey, fore-wing is bright yellow or orange (blue mark). The costa and margin of fore-wings of females are more convex than those of males.



L. tityrus female

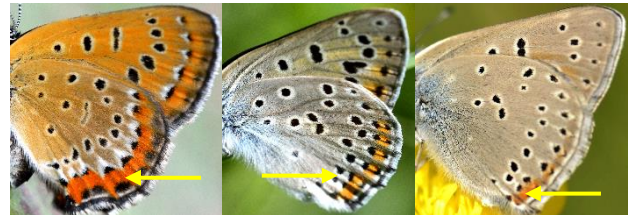
1.3 Coppers with violet sheen: Violet Copper (*L. helle*), Purple Shot Copper (*L. alciphron*), and Purple-edged Copper (*L. hippothoë*)

There is a bright purple sheen on the uppersides of *L. helle* **males**. The sheen on the much larger *L. alciphron* is rosy-violet, and it has only faint orange submarginal spots on the hind-wing (yellow mark). There is also some purple sheen on the males of *L. hippothoë*, but by its wide black margin and lack of black spots (except for its discal spots), it is easily distinguishable from the above species.



L. helle male *L. alciphron* male *L. hippothoë* male

The **underside** of *L. helle* is orange, with a striking red submarginal band (yellow mark). *L. alciphron* is brownish-grey, with some yellow tint on the fore-wings; the orange submarginal band is less striking. *L. hippothoë* is light brown, and there are only a few submarginal spots (no band).



L. helle male

L. alciphron male

L. hippothoë male

Females are different. Only the female of *L. helle* has blue/purple sheen, with much more orange on both wing **uppersides** than males. *L. alciphron* is uniform brown, greyish-brown with black spots and a striking orange submarginal band on hind-wings (yellow mark). Fore-wings of *L. hippothoë* are brown with orange/red suffusion and with orange/red submarginal bands on both wings (yellow marks).



L. helle female

L. alciphron female

L. hippothoë female

Underside of *L. helle* female is similar to that of male, black spots are somewhat larger. *L. alciphron* is yellowish-grey with yellow/orange tint on fore-wings, the black spots are large, the orange submarginal spots are well defined. Fore-wings of *L. hippothoë* are brownish-grey, somewhat brighter than those of males, orange submarginal spots are more pronounced than on males. Black spots are smaller than on *L. alciphron*.



L. helle female *L. hippothoë* female
L. alciphron female

1.4 Purple-edged Copper and Balkan Copper (*L. hippothoë* – *L. candens*)

The ranges of these two species do not overlap. *L. candens* occurs only in the Balkans. The colour of males of this species is more vivid, even the females are brighter than those of *L. hippothoë*.



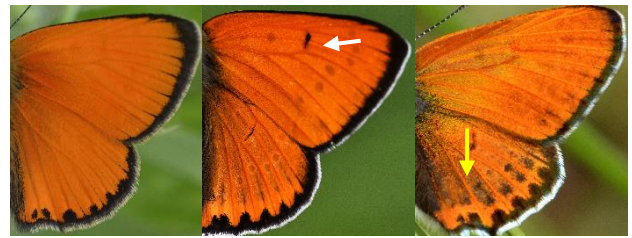
L. hippothoë male *L. hippothoë* female



L. candens male *L. candens* female

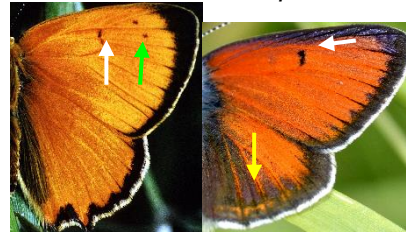
1.5 Coppers with fiery colour: Scarce Copper (*L. virgaureae*) Large Copper (*L. dispar*), Lesser Fiery Copper (*L. thersamon*), Grecian Copper (*L. ottomana*), and Purple-edged Copper (*L. hippothoë*)

These **males** have almost uniform fiery-red **uppersides** (seen even during flight). *L. virgaureae* and *L. thersamon* have no discal spot, while the other 3 species do have (white mark). *L. ottomana* has some small black dots on the subapical area (green mark). *L. virgaureae* and *L. ottomana* have no black suffusion on hind-wings, while *L. thersamon* and *L. hippothoë* have (yellow mark). There is a light purple sheen on the wings of *L. hippothoë*.



L. virgaureae male *L. thersamon* male

L. dispar male



L. ottomana male *L. hippothoë* male

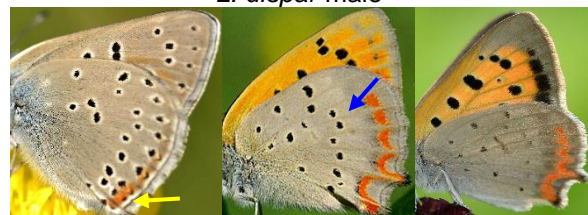
The **underside** of *L. virgaureae* is easily identifiable by the presence of white spots (white mark). The fore-wings of *L. dispar* are orange, the hind-wings are bluish-grey with orange submarginal band (yellow mark). The fore-wings of *L. thersamon* are also with orange tint and with white-ringed large black spots (blue mark); there are conspicuous orange submarginal spots on hind-wings (yellow mark). The colour of *L. hippothoë* is brownish-grey, with no orange tint on fore-wings and the yellow submarginal spots are reduced (yellow mark). 0 The underside of *L. ottomana* is brownish-grey, resembles that of *L. phlaeas* but with striking black spots (blue mark) on hind-wings.



L. virgaureae male

L. thersamon male

L. dispar male



L. hippothoë male

L. phlaeas male

L. ottomana male

L. virgaureae female is brownish-red, suffused with black, submarginal and postdiscal spots on both wings are well developed (white mark). *L. dispar* is coppery red, suffused with black with wide black margin (white mark), no marginal spots, postdiscal spots are small (green mark). The colour of *L. thersamon* is lighter, postdiscal spots are large (green mark), submarginal spots are present (white mark). *L. ottomana* is of similar colour with black suffusion; postdiscal spots are large (green mark), submarginal spots form a wavy black band (white mark). The black suffusion dominates on *L. hippothoë*, only the submarginal bands are clear orange.



L. virgaureae female *L. thersamon* female
L. dispar female



L. ottomana female *L. hippothoë* female

The underside of *L. virgaureae* female is easily distinguishable by the white spots. *L. dispar* has bluish hind-wings but the spots are generally larger than those of males; the orange submarginal band on hind-wings is similar to that of males. The colour of hind-wings of *L. thersamon* is greyish- or yellowish-brown; the black spots are larger than those of *L. dispar*. The underside of *L. ottomana* is similar to the male, by the bright orange band on the dark underwing makes it easily distinguishable from other coppers. The greyish-brown underside of *L. hippothoë* is somewhat brighter than those of males, there is some orange tint on fore-wings and the orange submarginal band (yellow mark) is more striking.



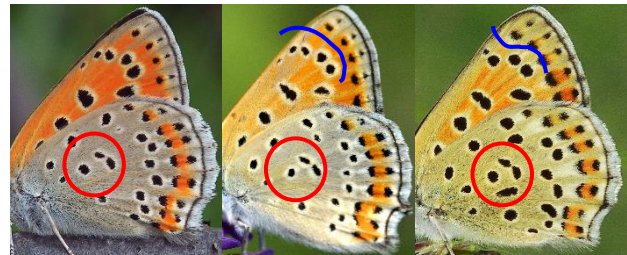
L. virgaureae female *L. thersamon* female
L. dispar female



L. ottomana female *L. hippothoë* female

1.6 Differentiation of *L. tityrus* female – *L. thersamon* female

The underside of *L. tityrus* is similar to that of *L. thersamon* female. Usually the fore-wings are orange-coloured (a). In some specimens the pale orange of the fore-wing (b) may resemble *T. tityrus*. The differences are as follows: 1) the colour of hind-wings is greyish on *L. thersamon*; 2) the postdiscal spots on the fore-wing of *L. thersamon* form a semicircle (blue mark) – or an S-shaped line on *L. tityrus*; 3) four discal spots on hind-wings form a circle on *L. tityrus* – or 3 spots form a semicircle on *L. thersamon* (red circle), however the fourth spot may be very small or absent – in such cases the #2 feature is more reliable.



a) *L. thersamon* b) *L. thersamon* c) *L. tityrus*

2. Hairstreaks (*Neozephyrus* [*Favonius*], *Satyrium*, *Callophrys* species)

2. 1 Purple Hairstreak (*Neozephyrus* [*Favonius*] *quercus*)

Purple Hairstreaks are easily identified.



N. quercus male *N. quercus* female

2.2. Brown Hairstreak (*Thecla betulae*)

Brown Hairstreak is easily identifiable.



T. betulae male *T. betulae* female

2.3 Green hairstreak (*Callophrys rubi*)

Green Hairstreak is easily identifiable.



C. rubi

2.4 Nogel's Hairstreak (*Tomares nogelii*)

An easily identifiable species. The subspecies *dobrogensis* lives only in East Romania and Moldova.



2.5 Satyrium species: Black Hairstreak (*S. pruni*), White-letter Hairstreak (*S. w-album*), Blue-spot Hairstreak (*S. spini*), Ilex Hairstreak (*S. ilicis*), and Sloe Hairstreak (*S. acaciae*)

The differentiation is based on their **undersides** (they are resting with wings closed). *S. w-album* has a distinct white W-shaped streak on its hind-wing (a). Sometimes this is faint (b), but the black-bordered red band is distinctive. The red submarginal band of *S. pruni* is wide and bright and bordered with white-capped black spots on the hind-wings. *S. spini* has a distinct blue spot near the tail (yellow mark). The wavy white line runs through both wings on *S. ilicis* (green mark); the red submarginal spots are more or less developed. The white streak is reduced on the fore-wing of *S. acaciae*, the streak runs almost straight on the hind-wing (green mark); red submarginal spots are reduced; there is a greyish triangle near the tail (yellow mark).



a) *S. w-album* b) *S. w-album* *S. pruni*



S. spini *S. ilicis* *S. acaciae*

3. Long-tailed Blue (*Lampides boeticus*), Lang's Short-tailed Blue (*Leptotes pirithous*), and Little Tiger Blue (*Tarucus balkanicus*)

All three species have short or long tail. The **underside** of *L. boeticus* is brown or greyish-brown with numerous wavy light (light grey) lines. There is a broad wavy white streak across the hind-wing (yellow mark). *L. pirithous* is brown with numerous wavy white streaks. The underside of *T. balkanicus* is white with numerous black streaks.

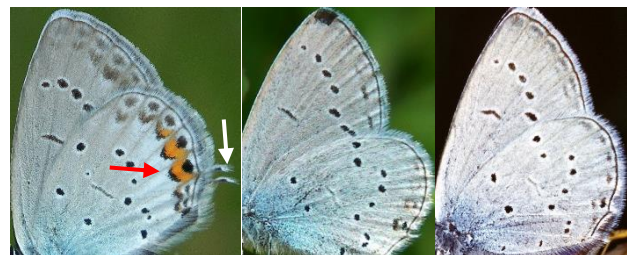


L. boeticus *L. pirithous* *T. balkanicus*

4. Cupido species

4.1. Short-tailed Blue (*C. [Everes] argiades*), Provençal Short-tailed Blue (*C. [Everes] alcetas*), and Eastern Short-tailed Blue (*C. [Everes] decolorata*)

There are 2-3 red/orange submarginal spots on the hind-wing **underside** of *C. argiades* (red mark). *C. argiades* has a (relatively) long tail (white mark). *C. alcetas* and *C. decolorata* cannot be distinguished by their underside.



C. argiades *C. alcetas* *C. decolorata*

Uppersides of males of all species are blue; *C. argiades* has the longest tail, the other display a very short tail or the wing is pointed (white mark). The identification of *C. alcetas* and *C. decolorata* is difficult. The colour of *C. alcetas* is blue or purplish blue, that of *C. decolorata* is light blue or greyish blue, sometimes smoky, with a thin discoidal line (yellow mark). The dark margin on the fore-wing on *C. decolorata* is usually wider (red mark).



C. argiades male *C. decolorata* male
C. alcetas male

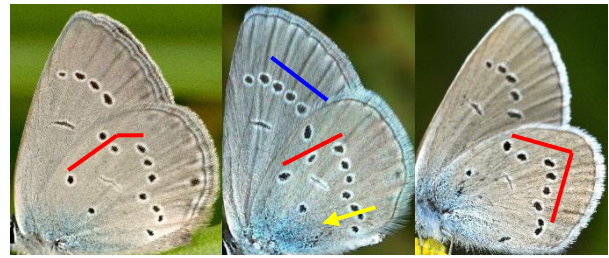
C. argiades **female** is dark, almost black with some blue suffusion (some specimens have 1-2 red spots a near to the tail), females of *C. alcetas* and *C. decolorata* are sooty-brown, their tail is very short. The latter cannot be distinguished (only by their genitals).



C. argiades female *C. decolorata* female
C. alcetas female

4.2. Small Blue (*C. minimus*) and Osiris Blue (*C. osiris*)

These two species have no tails. *C. minimus* is very small, *C. osiris* is somewhat larger. There is a marked blue flush on the base of hind-wing undersides of *C. osiris* (yellow mark) – less marked on *C. minimus*. The white-ringed (ovoid) black dots on the fore-wing underside are larger than those on the hind-wing – their size is similar on *C. osiris*. This is probably the most reliable marker. The other markers, due to their variability, are less reliable: 1) The white-ringed black dots (Nr. 2., 3., 4. and 5.) on the fore-wing underside form a more or less straight line (blue mark) on *C. osiris* – they form a semicircle or S-shaped line on *C. minimus* (but the lower dots are usually not visible). 2) The black postdiscal dots (Nr. 2., 3.) and the upper basal dot form a straight line on *C. osiris* – not on *C. minimus* (but the dot Nr. 2. often disappeared). The underside of the larger *Cyaniris semiargus* may seem similar, but the black dots on its hind-wing underside are arranged in a rectangle (red mark)



C. minimus *C. osiris* *Cyaniris semiargus*

The **males** of *C. minimus* and *C. osiris* are easily distinguishable by their upperside: *C. osiris* is bright violet-blue with narrow black margins, *C. minimus* is grey-brown with silvery blue scales near to the base.



C. minimus male *C. osiris* male

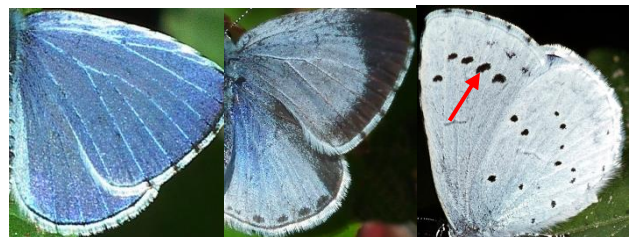
C. minimus **female** is sooty-brown with white fringes, *C. osiris* female is even darker with some blue scales at the bases – similar to a *C. minimus* male, though larger.



C. minimus female *C. osiris* female

5. Holly Blue (*Celastrina argiolus*)

The **underside** of *C. argiolus* resembles those of the former species, though its size is larger. The underside is light blue with small black dots, mainly elongated on the fore-wings (red mark).



C. argiolus male *C. argiolus* female

6. Eastern Baton Blue (*Pseudophilotes [vicrama] schiffmuelleri*), Baton Blue (*P. baton*), Bavius Blue (*P. bavius*), and Chequered Blue (*Scolitantides orion*)

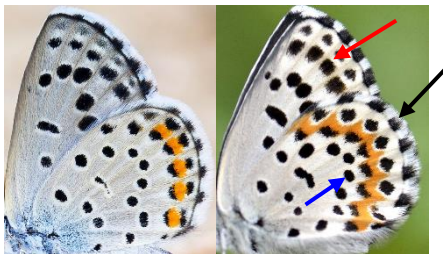
Small butterflies, with dark blue uppersides, large spots on their underside and chequered fringes.

P. baton resembles *P. vicrama schiffmuelleri* - the only reliable differences are in the form of their male genitalia. However, their ranges do not overlap, *P. baton* is a western, *P. vicrama schiffmuelleri* is an eastern-south-eastern species.



P. schiffmuelleri *P. baton* *P. bavius*

The **undersides** of *P. vicrama schiffmuelleri* hind-wings resemble *P. baton*, but the areas of these two species are more or less separated. *P. schiffmuelleri* is an Eastern, *P. baton* is a Western species, this may help in identification, however, exact diagnosis is based on genitalia. The submarginal orange spots form an almost confluent band on *P. bavius* (blue mark). *S. orion* has a double submarginal row on the fore-wing (red mark), the submarginal spots form a confluent band (blue mark) and the fringes are more strikingly chequered (black mark).



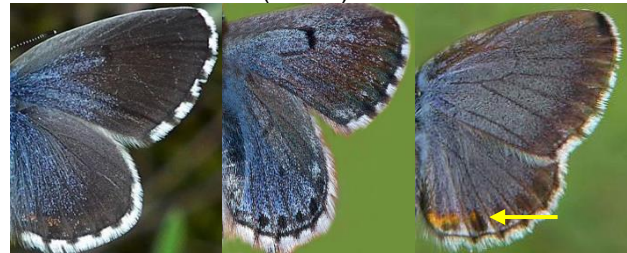
P. schiffmuelleri *S. orion*

Uppersides: All species display a black discal bar (white mark). *P. schiffmuelleri* and *P. baton* **males** are pale blue/greyish-blue and *P. bavius* is violet-blue with wide dark margin (red mark) and orange submarginal lunules on its hind-wing (yellow mark).

Females are more or less extensively flushed with black. *P. bavius* females, depending on subspecies, display more or less orange submarginal lunules (yellow mark).



P. schiffmuelleri *P. baton* *P. bavius*
(males)



P. schiffmuelleri *P. baton* *P. bavius*
(females)

S. orion **males** are dark blue flushed with black, in particular along the veins. *S. orion* has blue-ringed black spots (yellow mark). *S. orion* **females** are variable, dark with some blue flush (white mark) – mostly on the first brood; but submarginal spots (yellow mark) are easily discernible.



P. schiffmuelleri *S. orion* (2. brood)
S. orion (1. brood)

7. Green-underside Blue (*Glaucopsyche alexis*)

G. alexis is easy to recognize with its characteristic underside: grey with greenish-blue flush and large, white-ringed black spots. Sometimes black spots are seen only on the fore-wings, those on the hind-wings are very small or absent.



Glaucopsyche alexis

8. Maculinea [Phengaris] species: Large Blue (*M. arion*), Scarce Large Blue (*M. teleius*), Alcon Blue (*M. alcon*), and Dusky Large Blue (*M. nausithous*)

The grey **underside** of *M. arion* is easily identifiable by its large marginal black spots (yellow mark) forming a virtual semicircle; it has a blue flush at the base. *M. teleius* and *M. alcon* have greyish-brown undersides without blue flush. The black marginal spots of *M. teleius* are arranged in a more or less straight line on both wings (red mark), while those of *M. alcon* follow an arc or S-shaped line. The outer submarginal spots are very weak or absent on *M. teleius* (blue mark). *M. nausithous* is brown with no marginal or submarginal spots.



M. arion *M. alcon* *M. teleius*



M. nausithous

Males are blue. The black discal bar and the large oval postdiscal spots, arranged in a sharp arc are usually discernible on *M. arion*; postdiscal spots may be present (yellow mark). *M. alcon* has no discal bar and no postdiscal spots at all. The blue colour on *M. teleius* is flushed with black, the black postdiscal spots are elongated on the fore-wings and they are small and round on hind-wings. The pale blue colour of *M. nausithous* is extensively flushed with black, the black margin is very wide and the postdiscal spots are less prominent.



M. arion male *M. alcon* male *M. teleius* male



M. nausithous male

Females are more extensively flushed with black. *M. arion* has even larger postdiscal spots on fore-wings than males. *M. alcon* is almost sooty brown with some blue scales at the bases (the amount of blue depends also on the ecotype), the elongated black postdiscal spots are visible on fore-wings. *M. teleius* is black/dark grey with blue scales at the bases and with striking black postdiscal spots. *M. nausithous* is sooty brown with scarce blue scales at bases and no visible postdiscal spots.



M. arion female *M. alcon* female *M. teleius* female



M. nausithous female

9. Iolas Blue (*Jolana iolas*)

The upperside of *C. argiolus*, though much smaller, may resemble *J. iolas*, however, their undersides are quite different. The underside of *G. alexis* may also be similar, but its fore-wing spots are larger and there are no submarginal spots (red mark).



Jolana iolas

Glaucopsyche alexis
Celastrina argiolus

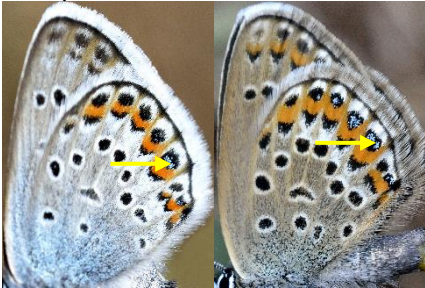
10. *Plebejus*, *Kretania*, *Vaccinia* and *Albulina* species

10.1 Silver-studded Blue (*P. argus*), Idas Blue (*P. idas*), Reverdin's Blue (*P. argyrognomon*), and Balkan Zephyr Blue (*K. sephirus*)

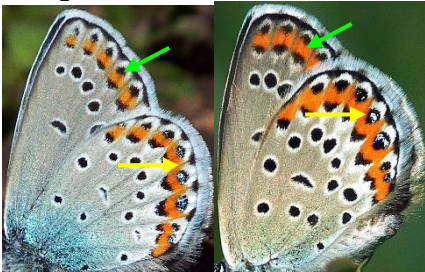
K. sephirus is easily identified by the absence of silvery-blue/green pupils (yellow mark) on the hind-wing **underside**. The orange marginal band is present on both wings on *P. argyrognomon* (green mark). *P. idas* and *P. argus* cannot be separated by their underside.



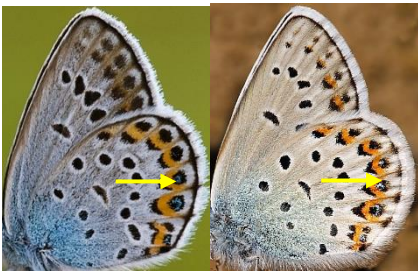
P. sephirus male female



P. argus male female



P. argyrognomon male female



P. idas male female

The colour of **males** are different (but it is not sufficient for identification), *P. argus* is the darkest blue with wide black margin (white mark). *P. sephirus* usually has black submarginal dots on hind-wings (red mark). Such dots may also appear on the hind-wings of *P. argus* and *P. argyrognomon*



P. sephirus male/female

P. argus male/female

The males of *P. argyrognomon* and *P. idas* are similar – they can be separated by their underside (see above). Females are usually sooty brown with variable bluish flush and orange marginal lunules. They cannot be separated by their upperside.



P. argyrognomon male/female



P. idas male/female

P. idas resembles *P. argus*, though larger and the black margin is narrow on males (white mark). The most reliable identification is based on the form of genitalia. Some authors suggest that *P. argus* can be identified (with respect to *P. idas*) by the presence of a small forward-pointing spine at the base of the fore-leg tibia (blue circle). However, it is hard to check in the field or in a photograph.



P. argus spine on the fore-leg

10.2 Cranberry Blue (*Vacciniina* [*Plebejus* *optilete*], Alpine Blue (*Albulina* [*Plebejus* *orbitulus*] and Glandon Blue (*Plebejus* [*Agriades*] *glandon*))

V. optilete males are violet-blue, females are sooty-brown with more or less blue flush. Their **underside** is characteristic: grey with large spots and only a few orange-capped marginal spots – usually one – with silvery-blue pupil (yellow mark).



V. optilete male female



A. orbitulus male female

Males of *A. orbitulus* are shining blue, females are sooty-brown. Their underside is characteristic: greyish-brown with conspicuous white spots.

P. glandon males are blue with a black spot in the cell (red mark), females are brown. **Underside** is brown with a white spot in the centre (yellow mark). There are conspicuous, broad white rings around the black spots (white mark).



P. glandon male female

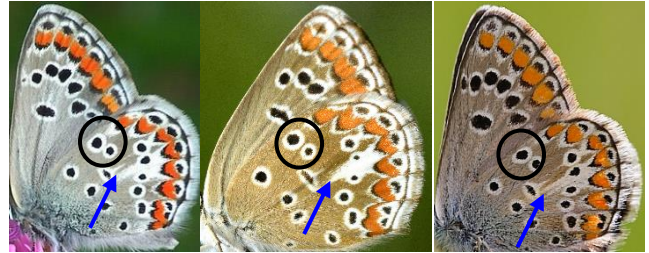
11. Argus (*Aricia*) species

11.1 Brown Argus (*A. agestis*) and Northern Brown Argus (*A. artaxerxes*)

A. artaxerxes is darker brown than *A. agestis* and the row of orange/red submarginal lunules is reduced, in particular on males. They may have white discal spots on fore-wings.



A. agestis male *A. agestis* female *A. artaxerxes*



A. agestis I. brood

A. Artaxerxes

A. agestis II. brood

A characteristic feature of *Aricia* species is the white streak running from the marginal lunules to the discal spot (blue mark). A second one is the position of 1. and 2. postdiscal spots: they are placed close to each other, i.e. the 2. is displaced basally (black circle) – their position is different on other blues, see *P. icarus* female below:



Polyommatus icarus

11.2 Geranium Argus (*Aricia [Eumedonia] eumedon*)

A. eumedon male is sooty-brown, with faint red/orange lunules on the hind-wings of females (yellow mark). A conspicuous, dart-like white streak is running from the cell to the postdiscal spots (blue mark) on the underside of hind-wings.



A. eumedon male female

11.3 Blue Argus (*A. anteros*)

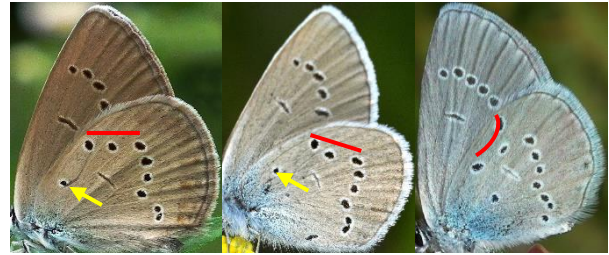
A. anteros male is pale blue with black discal bars. Females are sooty brown, resembling *A. agestis*. The underside is similar to that of *A. agestis*, some may have discal spot in the cell of fore-wing (see *P. icarus*, above). The white streak on hind-wing (blue mark) is less marked, it does not reach the cell and the cell spot is usually faint, only the white ring is conspicuous (yellow mark). The displaced 2. postdiscal spot is present.



A. anteros male female

12. Mazarine Blue (*Cyaniris semiargus*)

The underside is characteristic, however, it may resemble *Cupido osiris* and *Maculinea nausithous*. *M. nausithous* has no black dot (yellow mark) over the cell of hind-wing. The first 3 postdiscal spots are arranged in a straight line on the hind-wing of *C. semiargus* – not on *C. osiris* (see also 4.2).



C. semiargus

Cupido osiris



Maculinea nausithous

13. *Polyommatus* species

13.1 Damon Blue (*P. [Agrodiaetus] damon*) and Ripart's Anomalous Blue (*P. [Agrodiaetus] ripartii*)

These species have a conspicuous long white streak on their hind-wing underside (red mark). The males of *P. damon* are shiny blue with wide greyish-brown borders, females are brown. Both males and females of *P. ripartii* are brown. The fringes of *P. damon* are white, those of *P. ripartii* are brown (yellow mark).



P. damon male

P. damon female

P. ripartii male



P. damon

P. ripartii

13.2 Anomalous Blue (*Polyommatus [Agrodiaetus] admetus*)

Male *P. admetus* is plain brown, with hairy scent scales (yellow mark). Females have faint orange lunules on their hind-wings (green mark).



P. admetus male *P. admetus* female

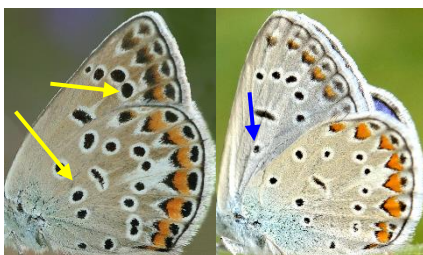
The **underside** is characteristic: the row of marginal spots is strongly reduced (white mark). *P. admetus* and *P. ripartii* males can be distinguished by their underside by the white streak (13.1). However, a shorter white streak (red mark) may be present on the hind-wings of *P. admetus*.



P. admetus male *P. admetus* female

13.3 Escher's Blue (*Polyommatus [Agrodiaetus] escheri*)

P. escheri closely resembles *P. icarus*, they can be separated by their underside: there is a black spot in the cell of fore-wing of *P. icarus* (blue mark) and the postdiscal black spots are larger on *P. escheri* (yellow marks).



P. escheri male *P. icarus* male

13.4 Eros Blue (*Polyommatus eros*) and False Eros Blue (*Polyommatus eros eroides*)

Both species closely resemble *P. icarus*. The **males** are shiny blue with black borders and black scales extending inward along the outer part of the veins (there are no dark borders on *P. icarus*). The border is wider and the black veins are more striking on the somewhat larger *P. eroides*. Females are similar to *P. icarus*. Another differentiating marker is the presence of a well defined black spot below the cell of fore-wing underside of *P. eroides* (black mark), in most cases cannot be observed in the field.



P. eros male *P. eroides* male underside

The black spot in the cell (blue mark) is usually present, but may be absent.



P. eros *P. icarus*

13.5 Common Blue (*Polyommatus icarus*), Chapman's Blue (*P. [Plebicula] thersites*), and Amanda's Blue (*P. [Neolysandra] amandus*)

Upperside: *P. amandus* males have a narrow dark and diffuse marginal band (yellow mark) with black scales extending inward along the outer part of the veins. The blue colour of *P. thersites* is flushed with violet and the postdiscal area (red circle) is darker and , if visible, the andoconium is lighter (black circle).



P. icarus male *P. thersites* male *P. amandus* male

Underside: 1) *P. icarus* and *P. thersites* males have a white triangle on the middle of hind-wing (blue mark) – *P. amandus* has no such spot.
2) Red/orange lunules are clearly visible on the fore-wings of *P. icarus* and *P. thersites* (yellow mark), not on *P. amandus*.
3) *P. icarus* has a black small spot in the cell of fore-wing (green mark).
4) The row of red/orange lunules is incomplete on the hind-wing of *P. amandus*.

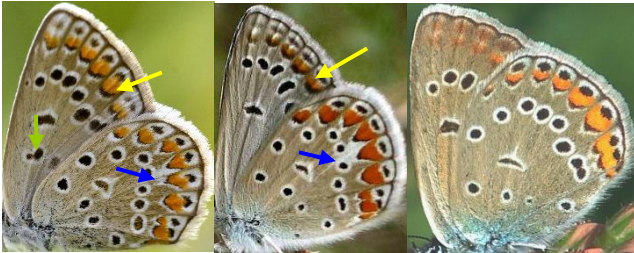


P. icarus male *P. thersites* male *P. amandus* male

Females cannot be differentiated by their upperside. Their undersides are similar to those of males, with the exception of the row of marginal red/orange lunules on *P. amandus*.



P. icarus female *P. thersites* female *P. amandus* female



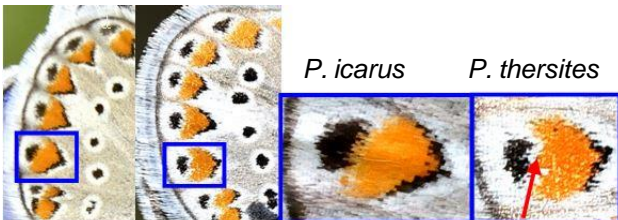
P. icarus female *P. thersites* female *P. amandus* female

A further sign on the hind-wing underside: the inner spots (P2, P3, P4) of *P. icarus* form a straight line (green mark); the distance between P2 and the first lunule is longer in *P. icarus* (red mark).



P. icarus *P. thersites*

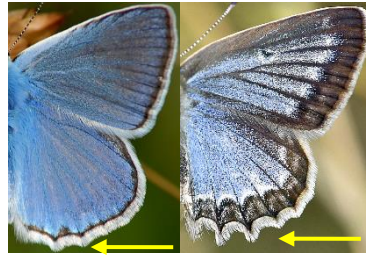
The orange lunules and black marginal spots of *P. thersites* (yellow mark above) are separated (red mark in insert).



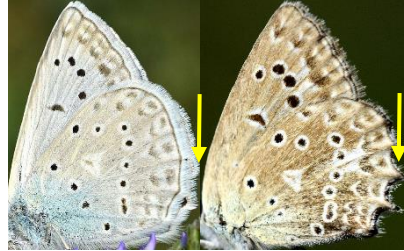
P. icarus *P. thersites*

13.6 Meleager's Blue (*Polyommatus [Meleageria] daphnis*)

The hind-wings of *P. daphnis* is scalloped - it is more striking on females (yellow mark), an exclusive feature of this species.



P. daphnis male *P. daphnis* female



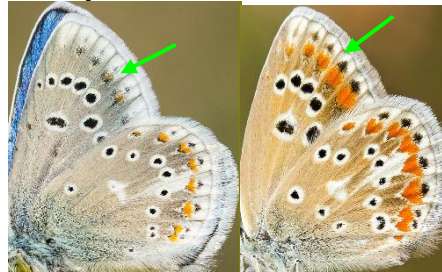
P. daphnis male *P. daphnis* female

13.7 Turquoise Blue (*Polyommatus [Plebicula] dorylas*)

P. dorylas males are shiny sky-blue with a slight turquoise sheen. Females are brown with slight blue flush at the base. A characteristic feature of their **undersides** is the marginal white border (green mark). The submarginal black spots make the white border narrower on females.



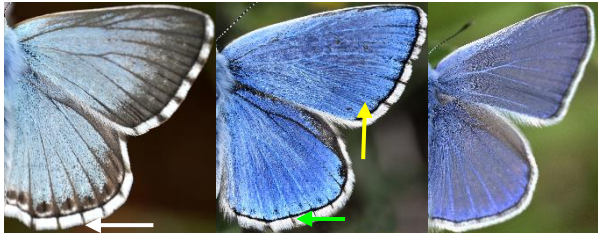
P. dorylas male female



P. dorylas male female

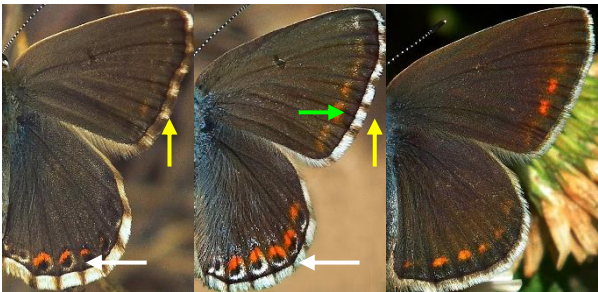
13.8 Chalk-hill Blue (*Polyommatus [Lysandra] coridon*), Adonis Blue (*Polyommatus [Lysandra] bellargus*), and Common Blue (*Polyommatus icarus*)

P. coridon male is silvery blue with a wide brown border, the veins are flushed with black, and there are black submarginal spots on the hind-wing (white mark). *P. bellargus* is brilliant sky-blue with a narrow but striking black border and chequered fringes, and often has small submarginal dots on the hind-wing (green mark). None of these features are present on *P. icarus*.



P. coridon male *P. bellargus* male *P. icarus* male

The fringes of *P. coridon* female are strikingly chequered with brown (yellow mark); there are a few red/orange – black-white submarginal spots on the hind-wings (white mark). The submarginal spots may faintly appear on the fore-wings. The fringes of *P. bellargus* are chequered with black (yellow mark), the row of submarginal spots is more striking and present also on fore-wings (green mark); the blue colour on the wings may vary – from faint flush to definitive blue.



P. coridon female *P. bellargus* female *P. icarus* female

Underside: The males of *P. coridon* and *P. bellargus* have similar undersides, both have chequered fringes, but the row of red/orange submarginal spots is usually more striking on the fore-wings of *P. bellargus* (there are no lunules on *P. coridon*). The fringes of *P. icarus* are not chequered. All three species display the white spot at the middle of hind-wing and the black spot in the cell of fore-wing (the spots are larger in *P. coridon* and *P. bellargus*)



P. coridon male *P. bellargus* male *P. icarus* male

P. coridon females are chocolate brown with striking brown-chequered fringes. The fringes of *P. icarus* are not chequered.



P. coridon female *P. bellargus* female *P. icarus* female

LIBYTHEIDAE

1. Nettle-tree butterfly (*Libythea celtis*)

L. celtis is easy to identify. A characteristic feature is its long palpi (yellow mark).



Libythea celtis

NYMPHALIDAE

1. Admirals (*Limenitis* species)

1.1 Poplar Admiral (*L. populi*)

This species is easy to identify, even in flight. Males are gracefully gliding along forest-paths. Females are somewhat bigger and lack blue iridescence. While males are often sipping on the ground, females are seldom seen at ground level.



L. populi

1.2 White Admiral (*L. camilla*) and Southern White Admiral (*L. reducta*)

***L. reducta* males** are velvety black with a bluish shine. The white stripe on hind-wings is wider than that of *L. camilla*. The **underside** of *L. reducta* is darker with a single marginal row of black dots on hind-wings (white mark) – *L. camilla* has a double row. The white stripe on hind-wing of *L. camilla* is continuous while it is made of 3 parts on *L. reducta* (red circle).



L. camilla

L. reducta



L. camilla

L. reducta

2. Gliders (*Neptis* species)

These two *Neptis* species are easily identifiable, their pattern is entirely different.



N. rivularis

N. sappho

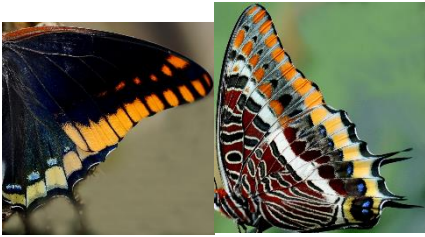


N. rivularis

N. sappho

3. Two-tailed Pasha (*Charaxes jasius*)

An easily recognizable species, even in flight (the upperside is seldom seen).



C. jasius

4. *Danaus* species (*D. plexippus* and *D. chrysippus*)

Easily recognizable rare migrants. Very large butterflies.



D. plexippus



D. chrysippus

5. Fritillaries (*Argynnis*, *Issoria*, *Brenthis*, *Clossiana* species)

5.1 Silver-washed Fritillary (*Argynnis paphia*), Cardinal Fritillary (*A. pandora*), and Pallas's Fritillary (*A. laodice*)

Males are easily recognized by their androconiums. Both *A. pandora* males and females are heavily suffused with green. *A. laodice* is bright orange and the female (insert) has a white spot near the fore-wing tip (white mark).

Their **undersides** are more characteristic:

- 1) The inner half of hind-wing of *A. laodice* is greenish-yellow, the purplish-brown outer part is separated by a white streak.
- 2) *A. paphia* is greenish with 3 silvery stripes.
- 3) *A. pandora* is green with one wider and one narrower silvery stripe; fore-wings are flushed with red.



A. laodice male female

A. pandora female

A. paphia male



A. laodice

A. paphia

A. pandora

5.2. High Brown Fritillary (*Argynnis adippe*), Dark Green Fritillary (*A. aglaja*), and Niobe Fritillary (*A. niobe*)

The **uppersides** of these species are similar; *A. adippe* is bright orange (females are less bright), its fore-wing is slightly concave (yellow mark). The black marginal border of *A. aglaja* is somewhat wider than those of others (white mark).



A. adippe

A. niobe

A. aglaja

A more precise identification is based on their **undersides**:

- 1) There are large silvery spots on the hind-wings of *A. adippe* (yellow mark), the brown postdiscal spots have silvery pupils (green mark), there are silvery spots even in the marginal row (blue mark).
- 2) Some forms (*f. eris*) of *A. niobe* has no silvery spots, but the brown postdiscal spots have silvery pupils (green mark), the marginal spots are striking (blue mark).
- 3) *A. aglaja* also has silvery spots (yellow mark), but the row of postdiscal spots is missing; there is a complete row of silvery submarginal spots (blue mark).



A. adippe

A. niobe f. eris

A. aglaja

5.3 Queen of Spain Fritillary (*Issoria lathonia*)

Easily recognizable with its greenish-brownish-black suffusion on the bases (white mark) and numerous rounded black spots – females have a stronger suffusion. Underside is characteristic, with large shiny silver spots (yellow mark).



I. lathonia

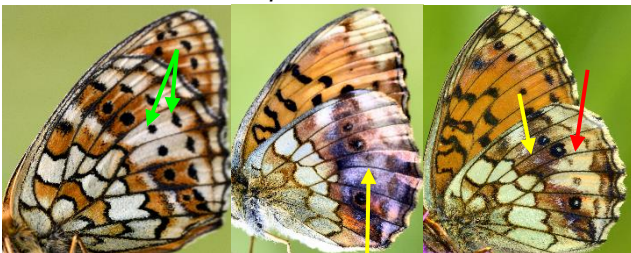
5.4. *Brenthis* species: Marbled Fritillary (*B. daphne*), Lesser Marbled Fritillary (*B. ino*), Twin-spot Fritillary (*B. hecate*)

B. daphne is the largest, and its fore-wings are more rounded than those of the others. *B. ino* has the most complete black marginal border on both wings. *B. hecate* displays the smallest black spots of these species. However, the exact identification is based on their **undersides**.

1. The outer half of underwings of *B. daphne* are bluish-purple (yellow mark).
- 2) *B. ino* has a brownish-purple band with eye-spots (yellow mark), the outer part of the hind-wing is yellow (red mark).
- 3) There are two complete rows of black spots on the hind-wing of *B. hecate* (green mark).



B. hecate *B. daphne* *B. ino*



B. hecate *B. daphne* *B. ino*

5.5 *Boloria* species: Small Pearl-bordered Fritillary (*B. [Clossiana] selene*), Pearl-bordered Fritillary (*B. [Clossiana] euphrosyne*), Weaver's Fritillary (*B. [Clossiana] dia*), Titania's Fritillary (*B. [Clossiana] titania*), Cranberry Fritillary (*B. [Clossiana] aquilonaris*), Thor's Fritillary (*B. [Clossiana] thore*), Shepherd's Fritillary (*B. pales*), Bog Fritillary (*B. [Proclassiana] eunomia*), Balkan Fritillary (*B. graeca*)

The **uppersides** of *B. selene* and *B. euphrosyne* are similar. *B. dia* is smaller and displays the large

rounded postdiscal spots (white mark). *B. titania* is the largest of them with complete rows of submarginal spots, forming acute-angled triangles on both wings (yellow mark). Both wings of *B. thore* are heavily suffused with black and with a strong dark border on its hind-wings. The basal streaks are most delicate on *B. eunomia*: the streaks on the bases are thinnest (white mark), these streaks are missing on *B. graeca*: basal spots are not connected with lines – (yellow mark). *B. napaea* males closely resemble *B. pales*, but they are larger and the markings, in particular the diagonal ones, are thinner. Females are heavily suffused with dark and greenish-violet colour. The exact identification of *Boloria* species is based on their undersides:



B. selene *B. euphrosyne* *B. dia*



B. titania *B. aquilonaris* *B. thore*



B. pales *B. eunomia* *B. graeca*

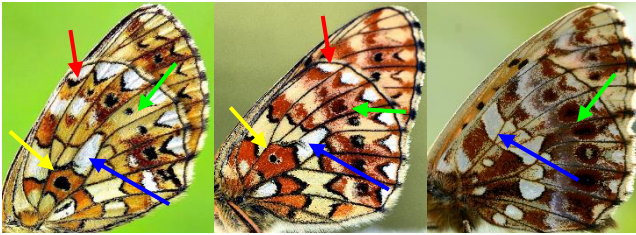


B. napaea male *B. napaea* female

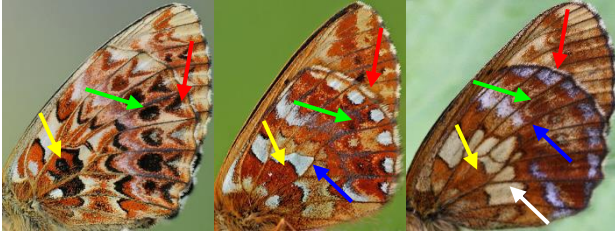
Underside:

1. *B. selene* has several white spots on yellow base, most striking in the central band, which is not uniform yellow (blue mark). Marginal spots are silvery white and covered with black (red mark). The rusty base of postdiscal spots is missing in the middle of wing (green mark). There is a large black spot on rusty-red base in the middle of hind-wing (yellow mark).
2. *B. euphrosyne* is similar, but the rusty-red colour of postdiscal band is more extensive (green mark); the central band is uniform yellow with only one silvery-white spot (blue mark). Marginal spots are white and covered with red/black triangles (red mark). The black dot is smaller in the red pentagon in the middle of hind-wing (yellow mark).
3. *B. dia* has several silvery spots (blue mark) on the dark violet-brown hind-wing. There is complete row

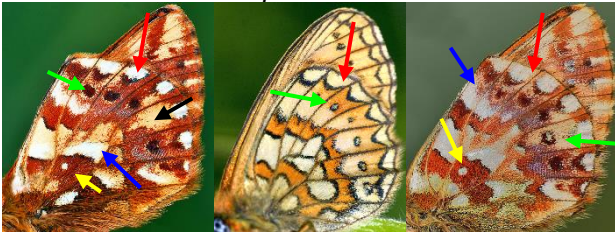
of dark postdiscal spots, some has silvery pupil (green mark).



B. selene *B. euphrosyne* *B. dia*



B. titania *B. aquilonaris* *B. thore*



B. pales *B. eunomia* *B. graeca*



B. napaea

4) *B. titania* is rusty-red (with very few light areas), there is a red-bordered black dot in the middle of the hind-wing (yellow mark) – similar to *B. euphrosyne* and *B. selene*. The postdiscal spots are large and black (green mark). The whitish, triangular marginal spots are not uniform (red mark).

5) *B. aquilonaris* is rusty-red with several white spots (blue mark), the postdiscal spots are less striking (green mark). The marginal white spots are not triangular (rounded or quadrangular) (red mark). There is no black dot/spot in the red pentagon in the middle of hind-wing (yellow mark).

6) *B. thore* is reddish-brown with a yellow central band (white mark) with some whitish spots (blue mark). The postdiscal spots are faint (green mark). The shapeless marginal spots are whitish with rusty-brown triangular caps (red mark). There is no black dot/spot in the rusty-brown pentagon in the middle of hind-wing (yellow mark).

7) *B. pales* is reddish-brown with some yellow and white (blue mark) spots. There is an incomplete row of dark postdiscal spots (green mark). Marginal spots are rounded with dark brown triangular caps (red mark). There is a small white dot in the rusty-red quadrangle in the middle of hind-wing (yellow mark).

8) *B. eunomia* is light yellow and orange. Marginal spots are triangular, white or light yellow (red mark). Postdiscal spots are small, circular with white centres (green mark).

9) *B. graeca* is light yellow heavily suffused with rusty-red and green and with white spots (blue mark). There is a row of postdiscal brown-ringed eye-spots (green mark). Marginal spots are white (red mark). There is a small white dot in the rusty-red quadrangle in the middle of hind-wing (yellow mark).

10) *B. napaea* is found only in alpine and subalpine areas. Its underside is similar to that of *B. pales*. However, the postdiscal black spots are less conspicuous (green mark), and there is no other colour in s_3 (black mark) than yellow – it is suffused with reddish-brown colour on *B. pales*.

6. Emperors (*Apatura* species)

A. iris and *A. ilia* males are iridescent with a brilliant bluish-purple. There is a dentate white band on the hind-wings of *A. iris* (yellow mark), - it is divided and not dentate on *M. ilia*. There is an orange/red circled dark eye-spot on the fore-wing of *A. ilia* (white mark), on the brown form (*f. clytie*), only the black spot is visible. *A. metis* has a small dot instead of eye-spot (white mark). There is a small eye-spot on the hind-wing of *A. ilia* (white mark), *A. metis* displays a small dot or no dot at all.

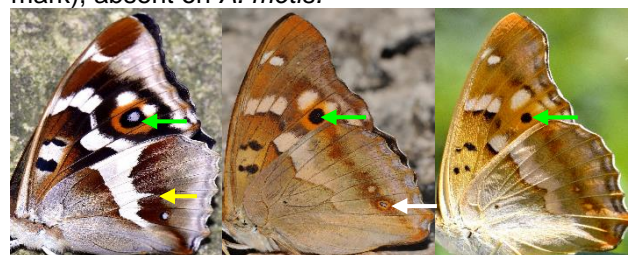


A. iris male *A. iris* female *A. ilia* male



A. ilia (*f. clytie*) a) *A. metis* b) *A. metis*

The white dentate band is also seen on the **underside** of *A. iris* (yellow mark). There is an orange and black ringed eye-spot with blue pupil on the fore-wing of *A. iris* (green mark); the eye-spot is smaller and without pupil on *A. ilia*, and there is only a small black dot on *A. metis* (green mark). There is a small eye-spot on the hind-wing of *A. ilia* (white mark), absent on *A. metis*.



A. iris *A. ilia* *A. metis*

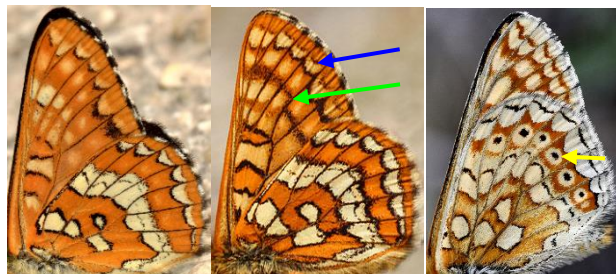
7. *Euphydryas* species: Scarce Fritillary (*E. [Hypodryas] maturna*), Cynthia's Fritillary (*E. [Hypodryas] cynthia*), Asian Fritillary (*E. [Hypodryas] intermedia*), and Marsh Fritillary (*E. [Eurodryas] aurinia*)

- 1) *E. maturna* and *E. intermedia* are similar, albeit the latter is much smaller, being a high mountain fritillary. There are two striking broad orange bands on both sooty-brown wings of *E. intermedia* (white mark).
- 2) The white bands are distinctive on the uppersides of *E. cynthia*. There are small black dots in the submarginal orange band (yellow mark).
- 3) The orange postdiscal spots of *E. aurinia* hind-wings have a black dot in the middle (yellow mark).



E. maturna *E. intermedia* *E. aurinia*

Undersides are more characteristic: Fore-wing yellow submarginal lunules (blue mark) on *E. intermedia* are arranged in a regular row; the adjacent postdiscal row is separated by a dark line (green mark) – none of them are present on *E. maturna*. The row of postdiscal light-ringed black spots are also seen on the underside of *E. aurinia*. Black dots are also present on hind-wings of *E. cynthia* (yellow mark).



E. maturna *E. intermedia* *E. aurinia*



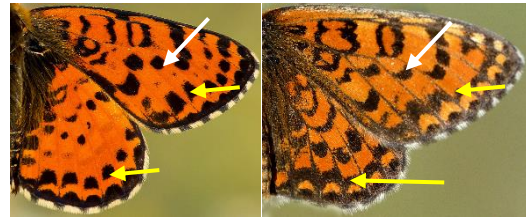
E. cynthia male female

8. *Melitaea* species:

8.1 Spotted Fritillary (*M. didyma*) and Lesser Spotted Fritillary (*M. trivia*)

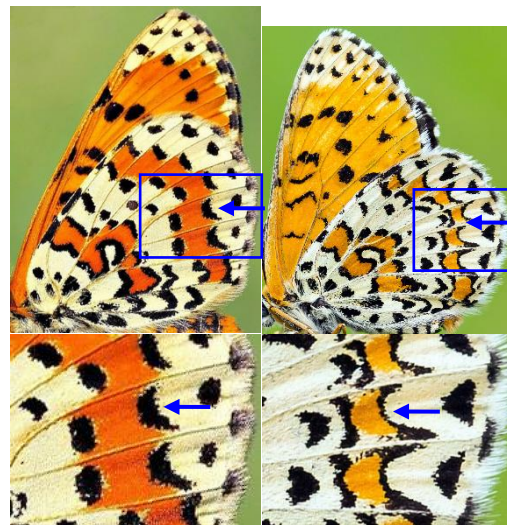
Their wing pattern is variable, the postdiscal row of spots is not continuous - contrasted with other *Melitaea* species (white mark). The submarginal row on both wings of *M. trivia* consists of lunules or V-shaped spots (yellow mark), forming a continuous zigzag line – the spots of *M. didyma* are either

rounded or angular and discontinuous. *M. trivia* is usually much smaller.



M. didyma *M. trivia*

The **underside** of *M. trivia* is pale - not orange but rather yellow, with interwoven black arcs at the top of marginal lunules on the hind-wings (blue mark) – the much thicker arcs are isolated on the hind-wings of *M. didyma*.



M. didyma *M. trivia*

8.2 Glanville Fritillary (*M. cinxia*) and Freyer's Fritillary (*M. arduinna*)

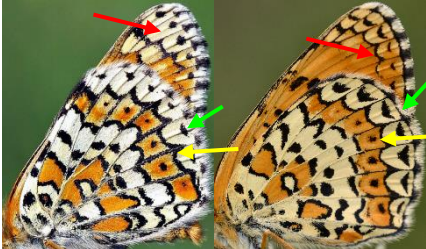
M. cinxia and *M. arduinna* are easily distinguishable from the other *Melitaea* species by their black dots in the postmedial row of hind-wings (yellow mark). *E. aurinia* also displays these spots, but its colour (yellow-orange stripes) and pattern of wings are different (see 6.). The black dots are placed in orange circles on *M. cinxia* and in orange half-domes on *M. arduinna*.

The **underside** of *M. cinxia* is pale (with less orange colour), the tip of fore-wing is light yellow (white mark) – it is orange on *M. arduinna*. The postmedial spots are placed in a yellow-orange base (yellow mark), their inner border is a strong black zigzag line – orange on *M. arduinna* and the inner border is tattered. The black triangles at the base of marginal lunules of hind-wing are more conspicuous and wider on *M. arduinna* (green mark).



M. cinxia

M. arduinna



M. cinxia

M. arduinna

8.3 Knapweed Fritillary (*M. phoebe*) – Eastern Knapweed Fritillary (*M. ornata*)

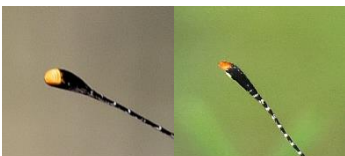
A characteristic feature of both species is the elongated lunule – sixth from above – on the fore-wing (red mark).



M. phoebe

M. ornata

The antennal club of *M. ornata* is more or less stubby.



M. ornata

M. phoebe

They have yellow-circled orange spots in the postmedial row on hind-wings (blue mark). The marginal lunules (red mark) on the hind-wings of *M. ornata* are triangular and discrete– arcuate and unbroken on *M. phoebe*.



M. phoebe

M. ornata

8.4 Heath Fritillary (*M. [Mellicta] athalia*), Assmann's Fritillary (*M. [Mellicta] britomartis*), Nickerl's Fritillary (*M. [Mellicta] aurelia*), and False Heath Fritillary (*M. diamina*)

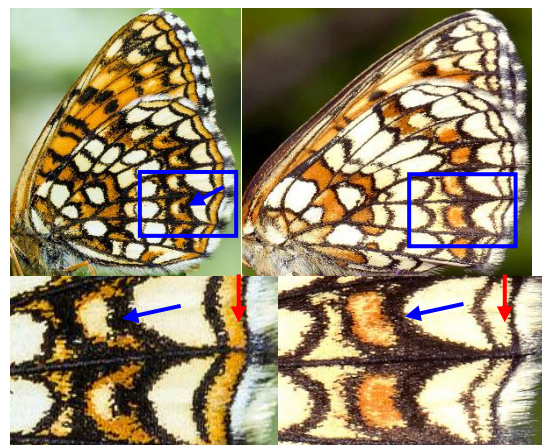
These species are difficult to identify by their **uppersides**, exact determination is usually based on their genitals. A characteristic feature of *M. britomartis* is the uniformity of orange/brown spots in the postmedial row (second from the margin) (white mark): they are either rounded or oval. For comparison see the wings of *M. athalia*.



M. britomartis

M. athalia

Undersides: There is a small black dot on the black caps of marginal lunules (blue mark) on the hind-wings of *M. diamina*. The marginal band is darker than the adjacent lunules (red mark). For comparison the wings of *M. athalia*.



M. diamina

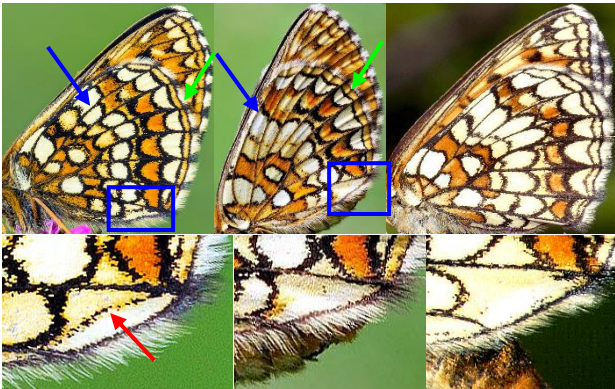
M. athalia

Similar to *M. diamina*, the marginal band of *M. britomartis* is also darker than the adjacent lunules (red mark).



M. britomartis *M. diamina* *M. athalia*

Differentiation of *M. britomartis* and *M. aurelia* is especially difficult. They both have a darker marginal band (green mark), than the adjacent lunules. The light band (blue mark) of the postdiscal rows is usually wider. The most important difference: the triangular cell between the anal veins is divided by a black line (red mark) on the hind-wing of *M. britomartis* – no such line is found on *M. aurelia* (or *M. athalia* – shown for comparison).



M. britomartis *M. aurelia* *M. athalia*

8.5 *Melitaea* species living in the Eastern Alps (Austria): Meadow Fritillary (*Melitaea parthenoides*), Grisons Fritillary (*M. varia*) and Little Fritillary (*M. asteria*)

M. parthenoides is common in Southwest Europe and is easily confused with *M. athalia*, though, it is more lightly marked and has an oblique black spot in the discal line (at least more oblique than that of *M. athalia* (yellow circle). However, exact determination is usually based on their genitals. *M. varia* hind-wing underside has a white discal band (yellow mark). *M. asteria* is heavily dusted and there is only one black marginal line on the hind-wing underside (black mark).



M. parthenoides



M. varia



M. asteria

8.6 Summary of *Melitaea*/*Mellicta* species

1. Light marginal band = *M. athalia*
2. Black dot on the black caps of marginal lunules = *M. diamina*
3. Dark marginal band + divided triangle between anal veins = *M. britomartis*
4. Dark marginal band – no divided triangle = *M. aurelia*
5. Single marginal band = *M. asteria* (occurs only in the Central Alps)
6. White discal band on hind-wing underside = *M. varia*
7. In Central Europe *M. varia* and *M. asteria* occur only in the Central Alps (Austria).
8. *M. parthenoides* is mainly a species of SW Europe

9. Map butterfly (*Araschnia levana*)

Both forms (*f. levana* and *f. prorsa*) have characteristic markings, making them easy to identify.



A. levana f. levana (spring brood)



A. levana f. prorsa (summer brood)

10. Comma (*Polygonia c-album*), Southern Comma (*Polygonia egea*), and False Comma (*Nymphalis vau-album*)

False comma is much bigger and heavily marked with black; there is a black apical patch on its forewing with a conspicuous white spot (white mark). *P. c-album* is orange with striking black spots. *P. egea* is light brown with only few black spots.



N. vau-album *P. c-album* *P. egea*

Undersides: their contours are similar, albeit *N. vau-album* is large. Both *P. egea* and *N. vau-album* have a small white L-shaped spot in the middle of hind-wing; the outer margins are light, the inner border is black. *P. c-album* has a more striking silvery-white spot, resembling a lying C.



N. vau album *P. c-album* *P. egea*

11. Large Tortoiseshell (*Nymphalis polychloros*), Yellow-legged Tortoiseshell (*N. xanthomelas*)

The colour of *N. xanthomelas* is brighter reddish-orange, with a wider black marginal border (yellow mark); there is white spot near to the apex (green mark).



N. polychloros *N. xanthomelas*

While the **underside** of *N. xanthomelas* is usually darker, the most reliable marker is the colour of their legs and palps. Those of *N. xanthomelas* are light brown – dark brown on *N. polychloros*.



N. polychloros *N. xanthomelas*

12. Camberwell Beauty (*Vanessa [Nymphalis] antiopa*)

Unmistakeable, easy to identify.



V. antiopa

13. Peacock (*Nymphalis [Inachis] io*)

Unmistakeable, easy to identify.



N. io

14. Small Tortoiseshell (*Nymphalis [Aglais] urticae*)

Unmistakeable, easy to identify.



A. urticae

15. Red Admiral (*Vanessa atalanta*, and Painted Lady (*Vanessa cardui*)

Both species are unmistakable.



V. atalanta *V. cardui*



V. atalanta *V. cardui*

16. Woodland Brown (*Lopinga achine*)

An easily identifiable species, in particular owing to the large, yellow-ringed eye-spots on its underside.



L. achine

17. Speckled Wood (*Pararge aegeria*), Wall (*Lasiommata megera*), Large Wall Brown (*L. maera*), and Northern Wall Brown (*L. petropolitana*)

P. aegeria is easily distinguished by its yellow spots and yellow/orange-ringed black eye-spots (red mark) on its hind-wings. The outer hind-wing margin is scalloped (yellow mark).



P. aegeria male *P. aegeria* female

L. megera is orange-brown with brown markings, while the other two species are sooty brown with more or less orange/light brown markings. Male *L. megera* has a wide brown band in the middle of fore-wing (white mark). The eye-spots of hind-wings are much larger on *L. maera* (yellow mark).

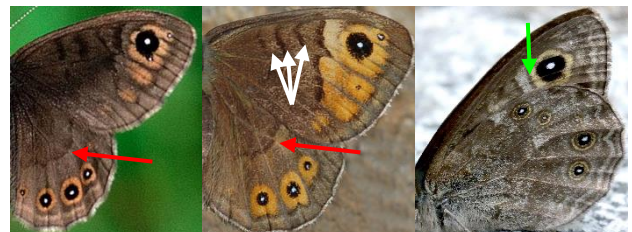


L. megera male *L. megera* female



L. maera male *L. maera* female

L. petropolitana resembles *L. maera*, but it has three postdiscal lines on fore-wings (white mark) - *L. maera* has two, and there is a brown postdiscal line on the hind-wings (red mark). The underside of *L. petropolitana* is darker, greyish-brown and there is no yellow stripe near the large eye-spot on the fore-wing (green mark).



L. petropolitana male *L. petropolitana* female

18. Kirinia species: Lattice Brown (*K. roxelana*), and Lesser Lattice Brown (*K. climene*)

Their outer edges are scalloped (blue mark) – more pronounced on *K. climene*. *K. roxelana* has a row of yellow-ringed black eye-spots with white pupils (yellow mark) – the eye-spots of *K. climene* are smaller and have no pupil (red mark).



K. roxelana *K. climene*

19. Coenonympha species: False Ringlet (*C. oedippus*), Pearly Heath (*C. arcania*), Scarce Heath (*C. hero*), Alpine Heath (*C. gardetta*), Large Heath (*C. tullia*), Chestnut Heath (*C. glycerion*), Small Heath (*C. pamphilus*), Eastern Large Heath (*C. rhodopensis*), Russian Heath (*C. leander*), and Balkan Heath (*C. orientalis*)

1) The **underside** of *C. oedippus* is bronze-brown with 5-6 yellow-ringed black eye-spots on the hind-wings and 1-2 (or 3-4 on female) eye-spots on fore-wings. The first eye-spot on the hind-wing is displaced towards the wing base. There is a silvery-gray stripe along the margins of both wings (red mark).



C. oedippus male *C. oedippus* female

2) There is a broad creamy white postdiscal band on the hind-wings of *C. arcania*. The first eye-spot (white mark) is situated at the inner side of the band.

3) *C. hero* is dark brown with a broad orange marginal band with 5-6 large black eye-spots and a dentate white or creamy band.

4) The fore-wing of *C. gardetta* is reddish-brown, the hind-wing is grey or greyish-brown with a white or greyish-white postdiscal band and a complete series of small black eye-spots.



C. arcania *C. hero* *C. gardetta*

5) Fore-wings of *C. leander* are orange with one (or two) eye-spots. Hind-wings are orange-brown with greyish-brown basal area. There is a complete row of small black eye-spots bordered by an orange submarginal band. There is no white band on the hind-wings (in contrast with *C. orientalis*).

6) *C. orientalis* is similar to the previous species, but it has a distinct white band on the hind-wings (blue mark).



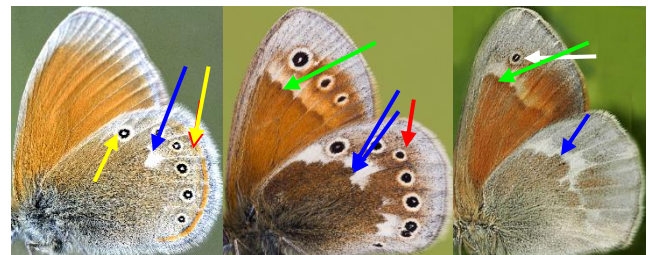
C. leander *C. orientalis*

7) The hind-wing of *C. glycerion* is greyish brown with a narrow orange marginal line (yellow mark) and white patch(es) (blue mark).

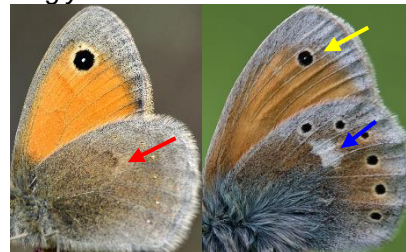
8) *C. tullia* is highly variable regarding the eye-spots. It has no orange marginal line (in contrast with *C. glycerion*). There is a pale postdiscal line on the fore-wings (green mark), and white patches (or band) on the hind-wings (blue mark).

9) *C. pamphilus* has no eye-spots on hind-wings only small light dots. The hind-wing is divided by a pale streak (red mark), the inner part is darker than the outer one. There is a large, yellow-ringed black eye-spot on the fore-wing.

10) There is a grey apex on the fore-wings of *C. rhodopensis* with one or two eye-spots (yellow mark). Hind-wings are greyish-brown with a pale (white or grey) patch near to the centre (blue mark). The number and size of black eye-spots varies.



C. glycerion *C. tullia* *C. tullia*



C. pamphilus *C. rhodopensis*

20. *Pyronia* species: Gatekeeper (*P. tithonus*) and Southern Gatekeeper (*P. cecilia*)

Both species are easily distinguishable by their bright orange-brown colour with a broad dark margin and conspicuous eye-spots on their fore-wings with two white pupils (yellow mark). The eye-spot is also visible on the underside. Male *P. tithonus* has a broad brown sex-band running diagonally through the fore-wing (white mark). This band is broken up by orange veins on *P. cecilia* male. Female *P. cecilia* has some faint brown arcs (green mark) beside the eye-spot - no such lines are on *P. tithonus* female; these lines are more striking on the underside. There are some, sometimes only faint, eye-spots (blue mark) on the underside of *P. tithonus* – no such spots are on *P. cecilia*.



P. tithonus male *P. tithonus* female



P. cecilia male *P. cecilia* female

21. Meadow Browns (*Maniola* and *Hyponephele* species): Meadow Brown (*M. jurtina*), Dusky Meadow Brown (*H. lycaon*), and Oriental Meadow Brown (*H. lupina*)

The uppersides of *M. jurtina*, *H. lycaon* and *H. lupina* males are similar. They can be separated by their underside. *M. jurtina* female has one black eye-spot with white pupil, on a broad orange smudge. *H. lycaon* and *H. lupina* have two eye-spots. However, these species seldom display their uppersides.



M. jurtina male *M. jurtina* female

1) The underside of *M. jurtina* is easily distinguishable: there is a small black eye-spot on the apex of fore-wing and there are two yellow-ringed black dots on the hind-wing (blue mark), sometimes additional very small black dots may also be present. A dark zigzag line divides the hind-wing, the inner part is darker – this is more striking on the

female. The underside of female is darker and the black eye-spot on the fore-wing is larger.



M. jurtina male female

2) *H. lycaon* and *H. lupina* males have only one eye-spot on their fore-wings, while females have two (the lower is not always visible!), a faint transversal line beside the upper eye-spot (green mark) is characteristic of females). The hind-wings of both *H. lycaon* and *H. lupina* are greyish-brown with marbled markings. Their hind-wings are scalloped.

3) *H. lupina* can be distinguished most easily from *H. lycaon* by its larger size. *H. lupina* is of similar size as *M. jurtina*, whereas *H. lycaon* is much smaller.



H. lycaon male/female



H. lupina male/female

Besides, *H. lupina* shows a more serrated hind-wing outer margin and its hind-wing is less roughly marked.

22. Ringlet (*Aphantopus hyperanthus*)

An easily recognizable species. Uppersides are sooty-brown with some eye-spots (females have more and larger eye-spots), fringes are white. Underside is coffee-brown with variable number of yellow-ringed eye-spots. The smaller *Coenonympha oedippus* may resemble this species but its has a silvery marginal line (red mark), and the eye-spots are arranged in a different manner (blue circle).



A. hyperanthus

C. oedippus

23. Dryad (*Minois dryas*), and Great Sooty Satyr (*Satyrus ferula*)

There are two distinctive, blue-pupilled black eye-spots on the fore-wings of *M. dryas* with no white dots in between. Females are larger and paler. *S. ferula* is sooty-brown with black eye-spots with white pupils and one or two white dots in between. The white spots are also visible on the underside.



M. dryas male *M. dryas* female



S. ferula

24. False Grayling (*Arethusana arethusa*)

The upperside of *A. arethusa* is characteristic with its orange bands (green line), however, they are seldom seen (the bands are smaller on males). The underside may resemble *H. semele* – both have orange fore-wings bordered with brown and with one black eye-spot. The hind-wing of *A. arethusa* is mottled brown with one pale discal band (white mark). There is a dark diagonal discal zigzag line (yellow mark) on the hind-wing of *H. semele* (see 27).



A. arethusa male *A. arethusa* *H. semele*

25. Great Banded Grayling (*Brintesia circe*)

B. circe is easily recognized by its characteristic broad white bands. The upperside is rarely seen, but the white band is also visible on its underside (yellow mark). There is also a second, smaller and shorter, white band (green mark).



B. circe

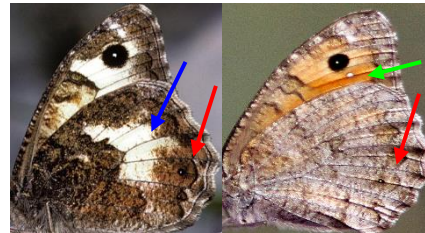
26. Hermit (*Chazara briseis*) and White-banded Grayling (*Pseudochazara anthelea*)

1) The most specific feature of the **underside** of *C. briseis* is a large dark brown spot within the cell of fore-wing (yellow mark). Males have darker markings.

2) The hind-wings of *P. anthelea* **males** are greyish-brown with a broad white or creamy white postdiscal band (blue mark) and some tiny eye-spots (red mark). There are two eye-spots on the fore-wing, however, the lower one is seldom noticeable. The **females** are entirely different, their fore-wings are orange-brown with mottled brown borders; white spots are usually seen between the two eye-spots (green mark). The white band on the hind-wing is faint (or rather absent), but small eye-spot(s), or only black dots are usually present (red mark). It is similar to other females of *Pseudochazara* species, however, they do not occur at his area.



C. briseis male *C. briseis* female

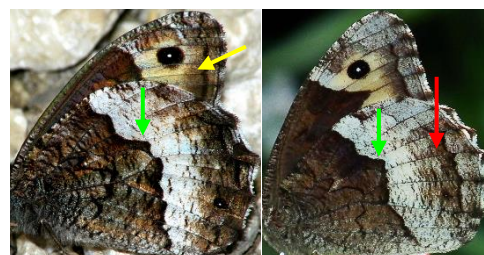


P. anthelea male *P. anthelea* female

27. Hipparchia species: Grayling (*H. semele*), Woodland Grayling (*H. fagi*), Rock Grayling (*H. alcyone*), Tree Grayling (*H. stalinus*), and Delattin's Grayling (*H. volgensis*)

1) The hind-wing **underside** of *H. fagi* is divided by a wavy dark brown discal line (green mark), the inner part is dark brown, the outer part is mottled white/grey. The black eye-spot on the fore-wing is surrounded with light yellow smudge (yellow line).

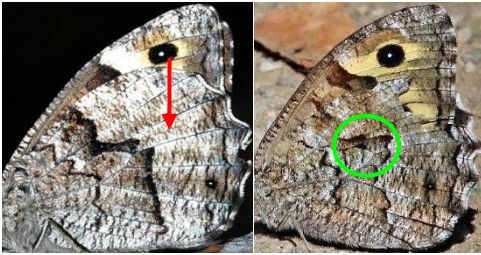
2) *H. alcyone* resembles *H. fagi*, albeit smaller. The discal line is black (green mark) – less wavy than that of *H. fagi*. The outer part from this line is lighter and broader (red mark).



H. fagi *H. alcyone*

3) *H. syriaca*, found in the Balkans, not easily distinguishable from *H. fagi*. *H. syriaca* is as large as *H. fagi*, but the postdiscal light band (red mark) is less conspicuous and more mottled, the discal line is usually more wavy.

4) *H. senthes* (considered a subspecies of *H. aristaeus* by some authors) is also a Balkan species coloured with more yellow and less gray. The protrusion of the discal band (green circle) is the most striking among these species. In general, the exact diagnosis is based on the genitals of these species.



H. syriaca *H. senthes*

5) The fore-wing of *H. semele* is bright orange-brown (yellow mark), the discal line on the hind-wing is dentate (green mark), the inner, lighter (whitish) part is narrow.

6) *H. volgensis* is found exclusively in the Balkans. It is inseparable from *H. semele* without reference to male genitalia, however, their areas do not overlap. Fertilized females possess a rudimentary sphragis (in contrast with *H. semele*).

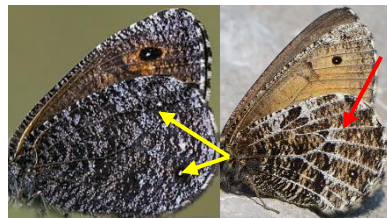
7) *H. statilinus* is greyish-brown; there is a small white dot between the two eye-spots on the fore-wing (blue mark). The outer part from the wavy discal brown line (green mark) is lighter but not white.



H. semele *H. volgensis* *H. statilinus*

28. Baltic Grayling (*Oeneis jutta*) and Alpine Grayling (*Oeneis glacialis*)

They cannot be confused: *O. glacialis* found exclusively in the Alps, *O. jutta* found in the Baltic states (e.g. Poland). The hind-wings of *O. jutta* are mottled with grey and brown with a dark discal band (not always discernible), and some small and faint eye-spots (yellow mark). Fringes are chequered. *O. glacialis* is light- or yellowish brown, the mottled hindwings have white-lined veins (red mark)



O. jutta *O. glacialis*

29. Marbled Whites (*Melanargia* species): Marbled White (*M. galathea*), Balkan Marbled White (*M. larissa*), and Esper's Marbled White (*M. russiae*)

M. galathea has no black stripe in the cell of fore-wing (*M. russiae* and *M. larissa* do have). There is an irregular black stripe in the middle of the cell on fore-wing of *M. russiae* (red mark) – this stripe is positioned away from the base of wing on *M. larissa* (red mark).



M. galathea



M. larissa



M. russiae

30. Dalmatian Ringlet (*Proterebia afra*)

The Dalmatian Ringlet occurs in the Balkans. It is dark brown with pale apical areas and a number of yellow/orange-ringed black eye-spots. The underside is characteristic: sooty-brown with pale veins (white mark) and a series of light-ringed black eye-spots (yellow mark).



P. afra

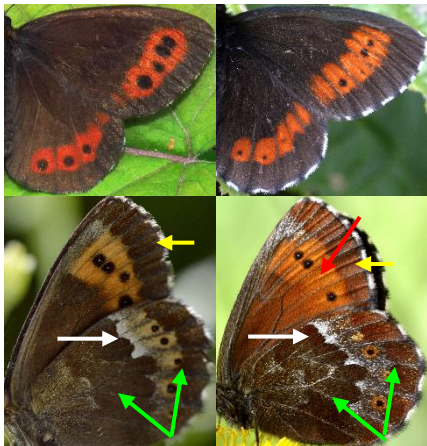
31. *Erebia* species

Not all species are easily distinguishable. The biotope, place (country) and altitude is important for identification.

31.1 Large species with chequered fringes: Arran Brown (*E. ligea*) and Large Ringlet (*E. euryale*)

The fringes of *E. ligea* and *E. euryale* are strongly chequered (yellow mark). Their exact identification is based on their **undersides**:

- 1) There is a distinctive white streak (white mark) - and some white marks - on the hind-wing of *E. ligea*. The inner part from the postdiscal line and the marginal band are of the same dark brown colour (green mark).
- 2) The third eye-spot (between m_2 and m_3 veins) on the fore-wings is often missing on *E. euryale* (red mark). The markings of hind-wings are highly variable, the white or creamy postdiscal band (white mark) may be quite striking or even very faint. The marginal band is lighter brown than the inner part (green mark) (in contrast with *E. ligea*).

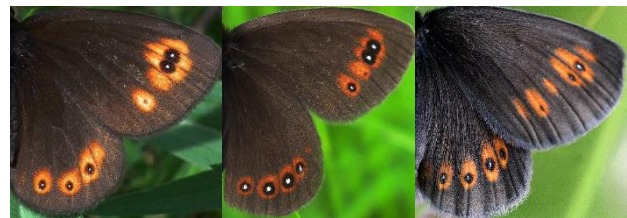


E. ligea

E. euryale

31.2 Large species with orange/red spots on their hind-wing undersides: Woodland Ringlet (*E. medusa*), Bright-eyed Ringlet (*E. oeme*), and Almond-eyed Ringlet (*E. alberganus*)

- 1) The uppersides of *E. medusa* and *E. oeme* are similar, the most striking difference is in the colour of their antennal tip: light (buffy) on *E. medusa*, and black beneath on *E. oeme* (red mark).
- 2) The number of red-ringed eye-spots is variable on both species, however, those of *E. oeme* have rounded and brighter white pupils (white mark) on the hind-wing underside.
- 3) The eye-spots on hind-wing underside of *E. alberganus* are situated in creamy/orange ovals („almond-like”) (white mark). The red spots on the uppersides are also oblong „almond-like”.



E. medusa

E. oeme

E. alberganus



E. medusa

E. oeme

E. alberganus



E. medusa *E. oeme*

31.3 Smaller species with orange/red spots on their hind-wings: Yellow-spotted Ringlet (*E. manto*), Mountain Ringlet (*E. epiphron*), Lesser Mountain Ringlet (*E. melampus*), Sudeten Ringlet (*E. sudetica*), Blind Ringlet (*E. pharte*), Eriphyle Ringlet (*E. eriphyle*), and White Speck Ringlet (*E. claudina*), Yellow-banded Ringlet (*E. flavofasciata*)

The uppersides of *E. manto*, *E. melampus* and *E. sudetica* are similar. Their **undersides** are different:

- 1) *E. manto* has many local and regional variations. Usually, there are no eye-spots on the undersides within the creamy or orange postdiscal oval spots – the spot between m_2 and m_3 veins is the longest (white mark). The basal areas on hind-wing underside are often dusted with red or pale scales (yellow mark).
- 2) *E. melampus* usually has black dots within the irregular orange/red spots on the underside, sometimes only within the spots of fore-wing. The 2nd-3rd red spot on hind-wing underside is larger and displaced (green mark).
- 3) *E. sudetica* is similar to *E. melampus*, but always has black dots (white mark) in the orange spots of hind-wing underside, the spots are of almost equal size and situated in a regular row.



E. manto

E. melampus

E. sudetica



E. manto *E. melampus* *E. sudetica*

4) The fore-wings of *E. pharte* are small, elongated with no black eye-spots (ocelli) within the orange/red spots either on upper- or undersides.

5) *E. epiphron* is highly variable. Orange postdiscal band usually narrower in the middle (white mark), without black dot in space 6 (yellow mark). Usually it has 3 orange spots on the upperside of hind-wings, depending on subspecies, they may be absent on hind-wings.

6) The red spots on the hind-wings of *E. eriphyle* lack black pupils, one spot in space 4 (white mark) is distinctly larger than the others.



E. pharte *E. epiphron* *E. eriphyle*



E. pharte *E. epiphron* *E. eriphyle*

7) There are small white dots on the hind-wings of *E. claudina* (white mark).

8) *E. flavofasciata* has a broad yellow or whitish-yellow postdiscal band with a series of black ocelli on the hind-wing underside (white mark).



E. claudina



E. flavofasciata

31.4 Large species with no orange/red spots on their hind-wings: Marbled Ringlet (*E. montana*), de Prunner's Ringlet (*E. triaria*), Scotch Argus (*E. aethiops*), Styrian Ringlet (*E. stiria*), Water

Ringlet (*E. pronoe*), Stygian Ringlet (*E. styx*), Sooty Ringlet (*E. pluto*) and Piedmont Ringlet (*E. meolans*)

1) The 3-4 orange/red spots are separated on the hind-wings of *E. aethiops* (white mark). There are four bands on the hind-wing underside, discal and postdiscal bands are similarly coloured (lighter bands: yellow marks, darker ones: red marks).

2) The orange band on the fore-wings of *E. montana* is broad with two conspicuous white-pupilled black eye-spots (white mark). The broad orange band extends to the hind-wing with several white-eyed black spots. Hind-wing undersides are mottled brown with a faint lighter band near the postdiscal line (green mark) and small white-pupilled black eye-spots (white mark). The outer margin of hind-wing of females is slightly scalloped.

3) *E. triaria* has 3 anterior adjacent eyes-spots on the fore-wing (white mark), they are also visible on the underside. Hind-wing underside is dark brown with small black spots with white pupils (yellow mark).



E. aethiops *E. montana* *E. triaria*



E. aethiops *E. montana* *E. triaria*

4) The orange band is bordered by a brown line, running almost straight down on the fore-wing underside of *E. stiria* (red mark). Hind-wing underside is dark brown or grey (female) with varying number (and size) of black, white-pupilled eye-spots (white mark).

5) The underside of *E. pronoe* is mottled greyish-brown with purple reflection and divided to four bands (similar to *E. aethiops*). The marginal band is separated by the veins into brown half-domes (green mark).

6) Similar to *E. stiria*, the orange band is bordered by a brown line, forming an apex, on the fore-wing underside of *E. styx* (red mark). Black eye-spots are smaller or missing.



E. stiria *E. pronoe* *E. styx*



E. stiria *E. pronoe* *E. styx*

7) *E. meolans* males are very dark brown, females are lighter. Hind-wing underside is very dark brown, sometimes with a postdiscal band less dark (blue mark). Females paler with larger ocelli. There is a conspicuous red band on the fore-wing underside (green mark).



E. meolans female

8) *E. pluto* is very dark (females are lighter) and either unmarked (a) or with small black, white-pupilled eye-spots (b) (white mark). Underside is greyish-brown and either unmarked or with small black spots with white pupils (yellow mark).



a) *E. pluto* b)

31.5 Small species with no orange/red spots on their hind-wing undersides: Silky Ringlet (*E. gorge*), Mnestra's Ringlet (*E. mnestra*), Dewy Ringlet (*E. pandrose*), Common Brassy Ringlet (*E. cassioides*), Swiss Brassy Ringlet (*E. tyndarus*), De Lesse's Brassy Ringlet (*E. nivalis*), Ottoman Brassy Ringlet (*E. ottomana*) and Lorkovic's Brassy Ringlet (*E. calcaria*)

A/ Wide red band on fore-wings:

- 1) There is a wide brick-red band on the fore-wings of *E. gorge* with two white-pupilled black eye-spots (yellow mark); the band is less broad on the hind-wings. Underside is brownish-grey mottled with brown, the markings are more striking on males. The hind-wing outer margin is slightly pointed (red mark).
- 2) Similar broad brick-red bands are on the fore-wings of *E. mnestra*, eye-spots are small or absent. Reddish band short and devoid of black ocelli on hind-wing upperside. The underside is more or less uniform brown (male) or with a slightly paler postdiscal band (female).
- 3) There are strong, dark discal and cellular lines on the fore-wings of *E. pandrose* (yellow mark). The underside is silvery grey with two dark wavy lines (green mark).



E. gorge *E. mnestra* *E. pandrose*



E. gorge *E. mnestra* *E. pandrose*

B/ Males have a strong metallic (brassy, green or bluish) sheen (it is difficult to distinguish between these species):

- 4) In the rounded or rectangular orange/red postdiscal band of the fore-wings of *E. cassioides*, there are two adjacent white-pupilled black spots (white mark). Orange spots are more prominent on hind-wings compared with *E. tyndarus*. The underside is grey with a dark wavy discal band (green mark).
- 5) There are broader orange spots on the fore-wings of *E. tyndarus*. Fore-wings are more convex compared with *E. cassioides*. The white pupilled black spots are smaller and less adjacent than on *E. cassioides* (white mark). Orange spots on hind-wing are less striking, often missing. Underside is similar to *E. cassioides*.
- 6) The upperside orange band of *E. nivalis* is shorter and always extends to the cell (yellow mark). Undersides are similar to *E. cassioides* and *E. tyndarus*. Where it flies together with *E. tyndarus*, *E. nivalis* is found at higher altitudes.
- 7) The upper part of the orange postdiscal band on the fore-wing of *E. ottomana* is much broader extending to the cell (yellow mark) and has two black spots with white pupils (white mark). Fore-wing margin is straight – not rounded, however, the difference between 'rounded' and straight' margins is subtle (blue mark). Underside is greyish-brown with a strong brown (or reddish) discal band (green mark).
- 8) *E. calcaria* males also have a metallic sheen. Fore-wing margin is rounded. The orange band is small and faint, does not extend to the cell, the black eye-spots are visible (white mark). Underside is silvery-grey with a dark discal band (green mark).



E. cassioides *E. tyndarus* *E. nivalis*



E. cassioides *E. tyndarus* *E. nivalis*



E. ottomana *E. calcaria*



E. ottomana *E. calcaria*

31.6 Ringlets found exclusively in the Balkans: Black Ringlet (*E. melas*), Bulgarian Ringlet (*E. orientalis*), Nicholl's Ringlet (*E. rhodopensis*).

- 1) *E. melas* resembles *E. pluto*, but their ranges do not overlap. Its upperside is almost black with two adjacent black eye-spots with white pupils (white mark). The number of other eye-spots varies. Underside is mottled brown with a dark discal band (green mark) and some black eye-spots (white mark).
- 2) The fore-wings of *E. orientalis* are narrow and pointed with a weak orange band and some black ocelli (white mark). Underside is uniform brown with orange-ringed black eye-spots (white mark).
- 3) *E. rhodopensis* has a broad orange band on the fore-wings the upper part of which extends to the cell (yellow mark) and has two adjacent, white-pupilled black eye-spots. The number of other eye-spots varies. The underside of hind-wing is divided to pale and dark areas by the basal and postdiscal bands



E. melas *E. orientalis* *E. rhodopensis*



E. melas *E. orientalis* *E. rhodopensis*

31.5 Hints for Differentiation of *Erebia* Species

Erebia species are highly variable, form several subspecies affecting the number and size of spots, eye-spots, even their colour. Some species look similar, however, their range do not overlap. Therefore, the area/biotope/altitude are also of importance in determining the ringlets.

- 1) Exclusively in the Alps = *E. stiria*, *E. pluto*, *E. calcaria*, *E. styx*, *E. melampus*, *E. montana*, *E. flavofasciata*, *E. claudina*, *E. meolans*, *E. mnestra*, *E. nivalis*, *E. tyndarus*
- 2) Exclusively in the Balkans = *E. rhodopensis*, *E. melas*, *E. orientalis*
- 3) Also in lowland areas = *E. medusa*, *E. aethiops*
- 4) Red-ringed eye spots are rounded with bright white pupils = *E. aethiops*, *E. oeme*
- 5) Fringes chequered; white streak on hind-wing underside = *E. ligea*, *E. euryale*
- 6) Three anterior adjacent eye-spots on fore-wing upperside = *E. triaria*
- 7) No orange/red band on the upperside = *E. melas*
- 8) No black ocelli or dots in red/orange postdiscal spots on upperside = *E. pharte*
- 9) Red spots on hind-wing underside are of almost equal size and situated in a regular row = *E. sudetica*
- 10) The 2nd or 3rd orange spot is larger and displaced on hind-wing underside = *E. melampus*
- 11) Red/orange spots with black eye-spots on hind-wing – no ocelli in 6th spot = *E. epiphron*
- 12) Red/orange spots lack black ocelli on hind-wing underside, one spot in space 4 is distinctly larger than the others = *E. eriphyle*
13. No orange/red spots on their hind-wing underside = *E. montana*, *E. triaria*, *E. aethiops*, *E. stiria*, *E. pronoe*, *E. styx*, *E. pluto*, *E. meolans*, *E. gorge*, *E. mnestra*, *E. pandrose*, *E. cassioides*, *E. tyndarus*, *E. nivalis*, *E. ottomana*, *E. calcaria*
- 14) Broad orange band on the fore-wings with two black eye-spots = *E. montana*, *E. gorge*, *E. rhodopensis* – *E. mnestra* displays also a broad orange band but the spots are either small or absent
- 15) Small white dots on both sides of hind-wings = *E. claudina*
- 16) Black eye-spots with white pupils on both fore- and hind-wings = *E. melas*, *E. pluto*
- 17) Broad yellow or whitish-yellow postdiscal band with a series of black ocelli on the hind-wing underside = *E. flavofasciata*
- 18) Oval creamy spots with no black ocelli on their hind-wing underside = *E. manto* – *E. mnestra* may also have no spots, but its wide orange band on fore-wing upperside is distinctive
- 19) Red spots without black ocelli on their hind-wing undersides = *E. pharte*, *E. manto*, *E. melampus*, *E. epiphron*, *E. eriphyle*
- 20) Strong, dark discal and cellular lines on the fore-wings = *E. pandrose*
- 21) Metallic sheen on the upperside of males = *E. cassioides*, *E. calcaria*, *E. tyndarus*, *E. nivalis*, *E. ottomana* – the sheen is less brilliant on the latter.

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BUTTERFLIES of Central Europe & Britain: a photographic identification guide



Peter Gergely is an emeritus professor of immunology. As a young boy he enthusiastically collected butterflies. Later, as a physician, he stopped collecting. Instead, he started photographing them from the early seventies. With his fellow photographers, he has written an illustrated field guide on the butterflies of Hungary. This enlarged English version of the guide includes the countries of Central Europe and Britain.

