



DISCOVERING THE BUTTERFLY WORLD

Butterfly Identification: families and resources

Differences between butterflies and moths

In culture and taxonomy, two main categories of Lepidoptera are distinguished:

mariposa – polilla

farfalle – falene

butterfly – moth

schmetterling – motte

πεταλούδα – σκώρος





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Butterfly

@P. Mazzei

Moth

@P. Mazzei

Moth

@P. Mazzei

Moth

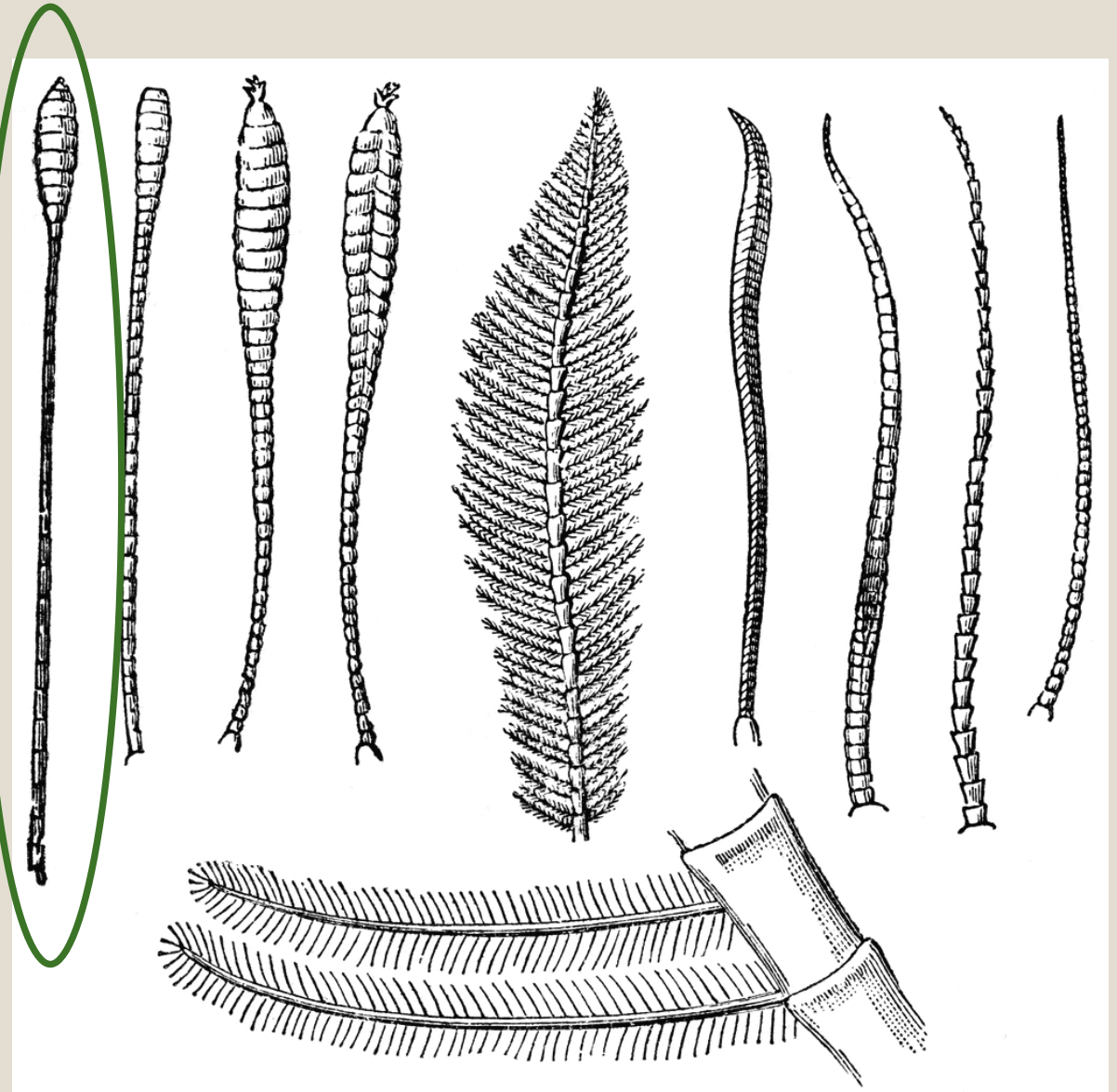
@P. Mazzei

Butterflies and Moths

Taxonomists have been searching for decades for an unique character that can distinguish butterflies and moths.

The only character that has been recognized was the shape of the antennae, which only in butterflies show a typically elongated shape ending in a mace, while in moths the antennae take many other shapes, except for this one. For this reason, Lepidoptera had been divided into:

- **Rhopalocera/Butterflies** (antennae with mace)
- **Heterocera/Moths** (antennae with other shapes)



Hazlitt Alva Cuppy PH.D., Editor Beauties and Wonders of Land and Sea (Springfield, OH: Mast, Crowell & Kirkpatrick, 1895)



Those colorful individuals are moths

Butterflies and Moths

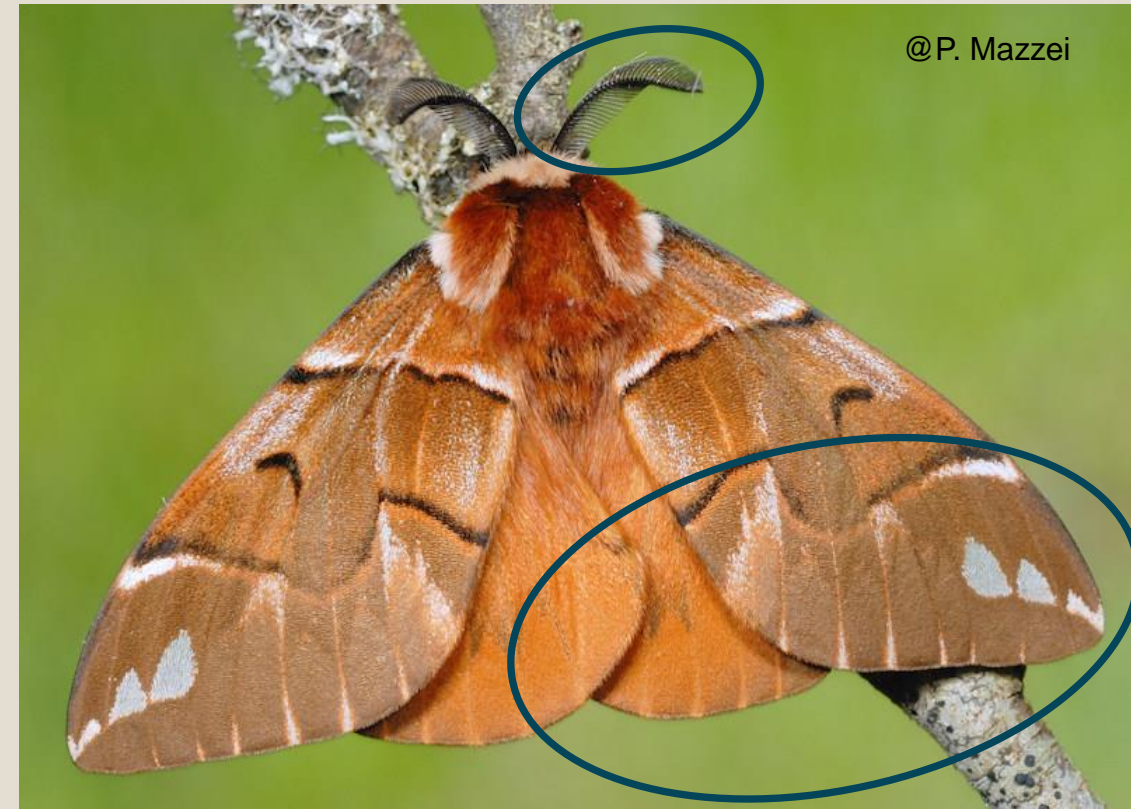


The great majority of moths belongs to the microlepidoptera group



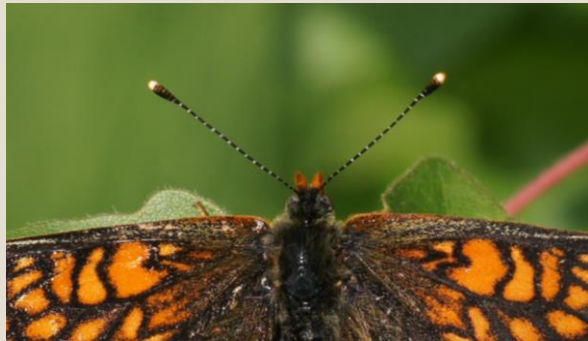
Butterflies and Moths

- **Butterflies**: slender filamentous antennae which are club-shaped at the end. Wings spread in resting posture or folded about their backs
- **Moths**: comb-like or feathery antennae and triangular shape wings in resting posture

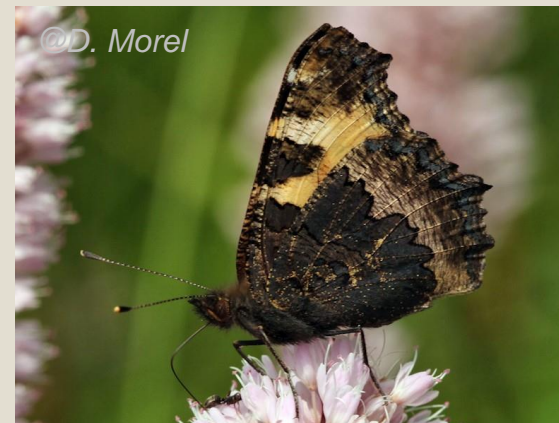


How to identify butterflies?

1. Is it really a butterfly? Check antennae (club-shaped) and type of flight



2. Check upperside and underside for specific characteristics

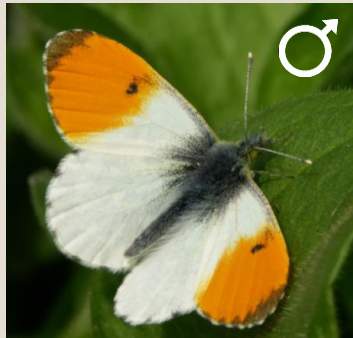


Aglais urticae

How to identify butterflies?

3. Be aware male and females can be different (dimorphism)

Anthocharis cardamines



Polyommatus thersites

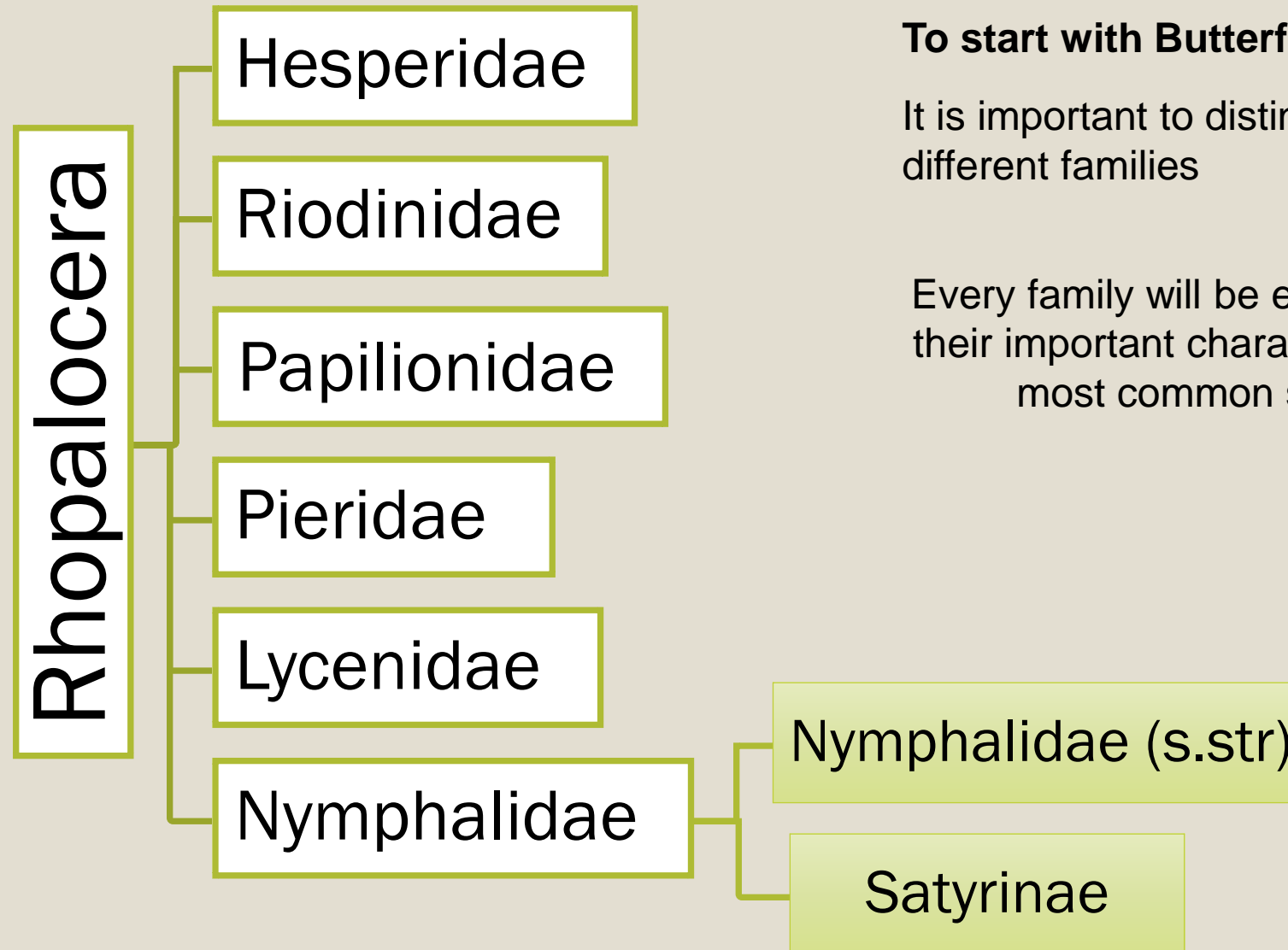
4. Doubts: catch or take a picture of the butterfly



5. Share your doubts in social media: iNaturalist, Facebook, other platforms



Butterfly Families



To start with Butterfly identification:

It is important to distinguish the different families

Every family will be explained with their important characteristics and most common species

1. Butterfly families

Skippers - Hesperidae



Papilionidae



Whites - Pieridae



Riodinidae



Lycaenidae



Nymphalidae



1. Skippers – Hesperiiidae



© Erk Dallmeyer

Erynnis tages – dingy skipper

- Small body, 'stocky'
- Large, broad head
- Thick, massive thorax
- Relatively small wing area
- Tip of the antenna is curved
- Antennae stem far from each other on the head

1. Butterfly families

1.1 Family Hesperiidae

Hesperiinae



Heteropterinae



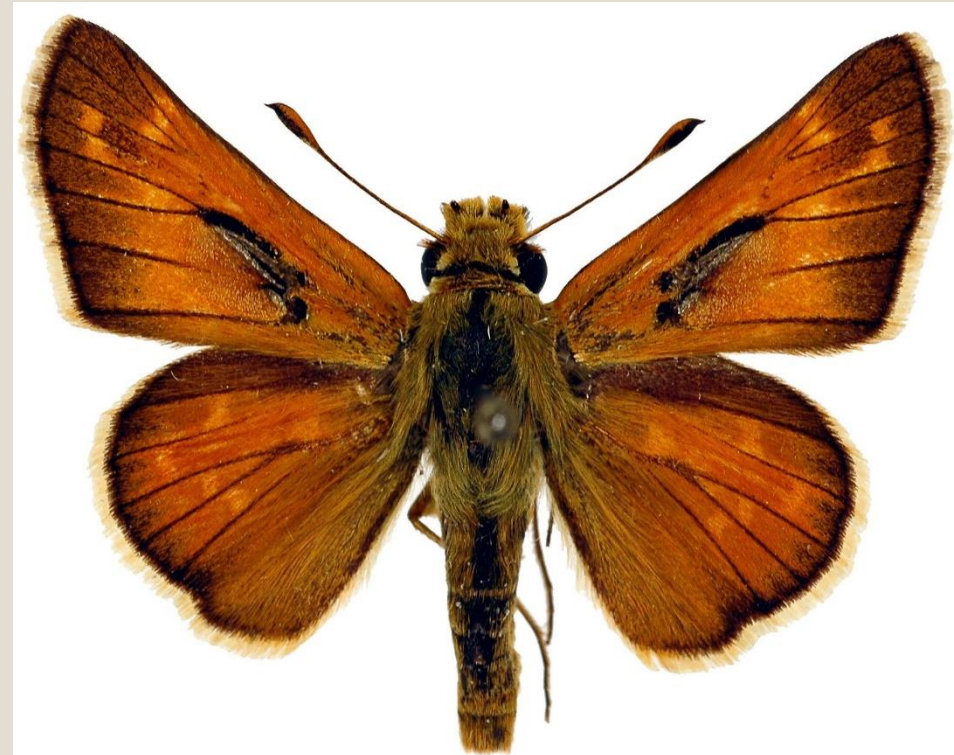
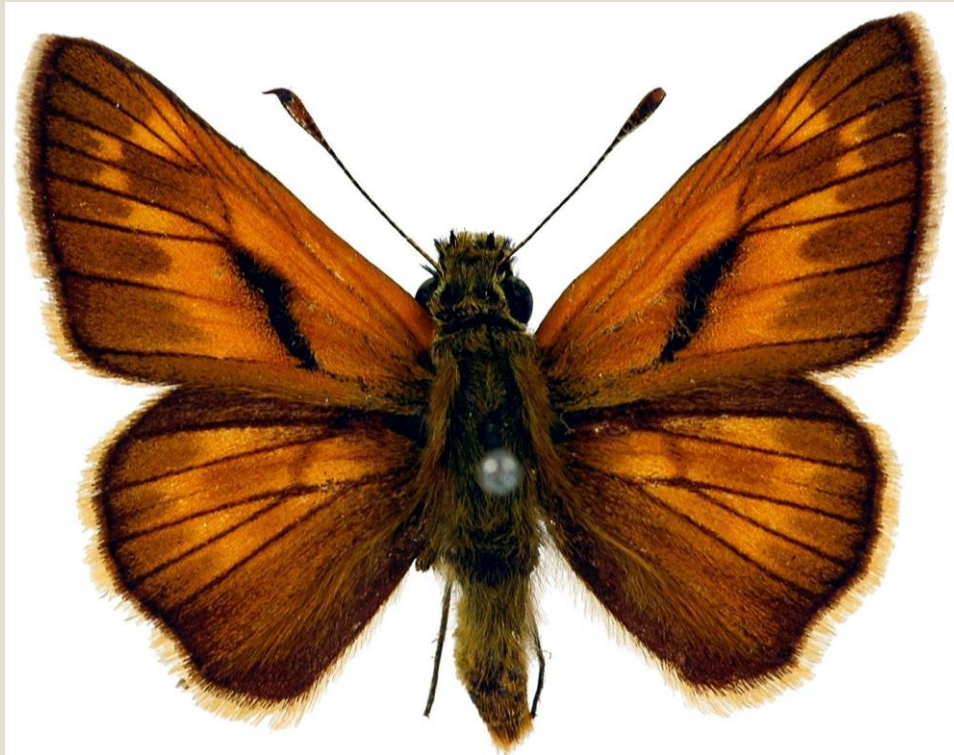
Pyrginae



Family Hesperiiidae: Hesperinae



These are two different species. Which photos belong to the same species? What are the differences?



Family Hesperiidae: Hesperiinae



*How many species
can you distinguish?*



Family Hesperiidae: Hesperinae



Clear, conspicuous white spots

Dull, yellowish spots



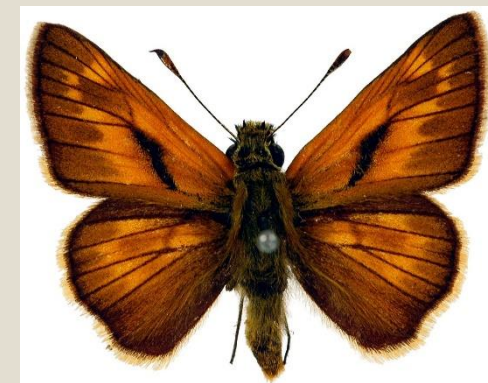
2 species

Family Hesperiidae: Hesperinae



Hesperia comma

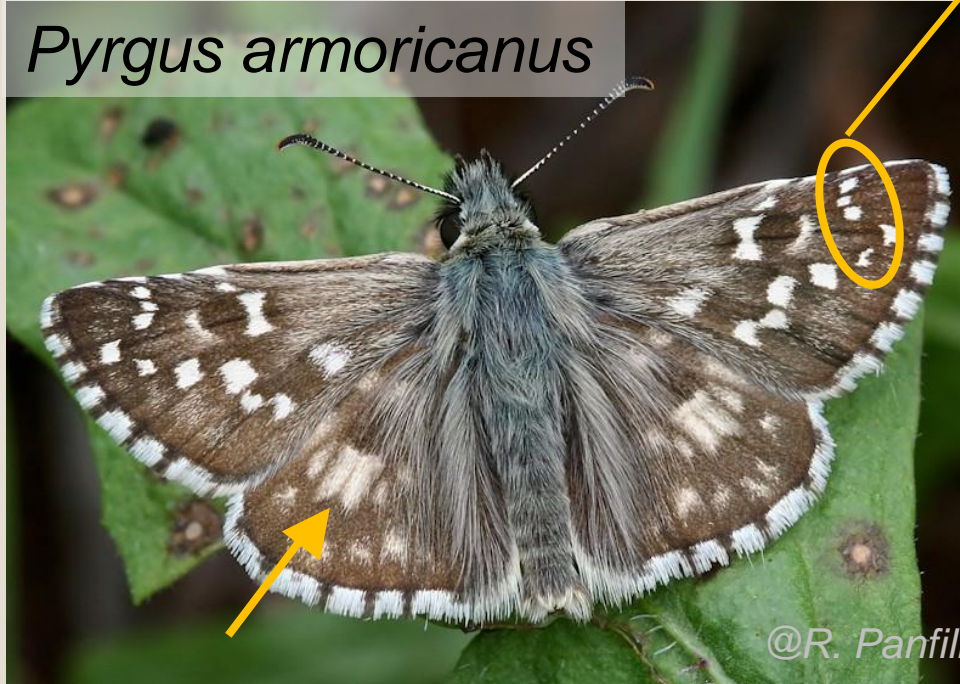
**The important
key features
are often on
the underside
of the wings!**



Ochlodes sylvanus

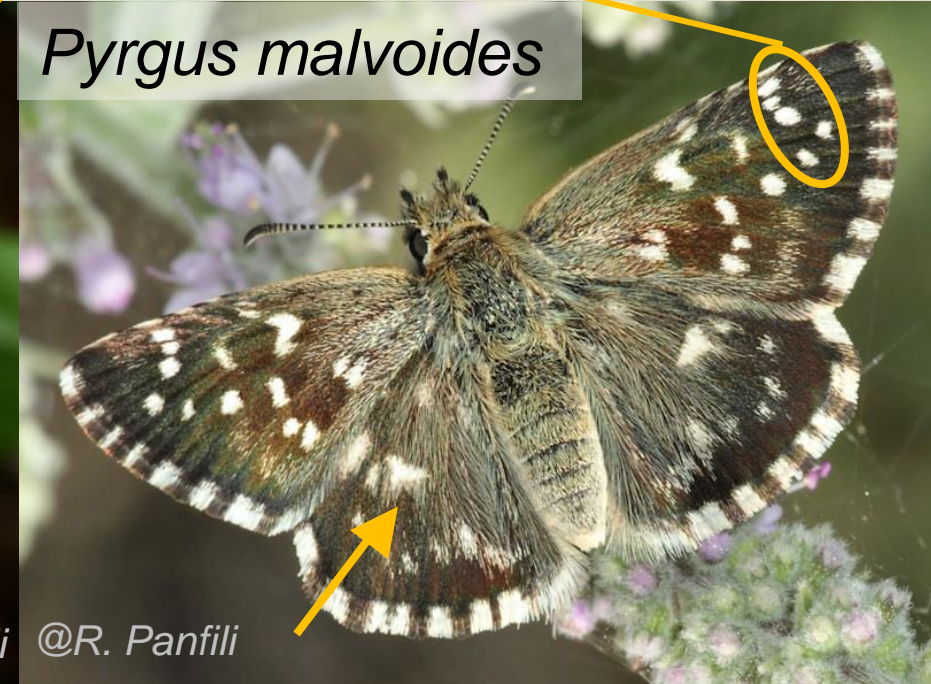
Family Hesperiiidae: Pyrginae

Pyrgus armoricanus



Pyrgus sp.

Pyrgus malvoides



Spialia sertorius



Carcharodus alceae



1. Papilionidae



Iphiclidides podalirius



Papilio machaon



Zerynthia polyxena



Parnassius mnemosyne

- Large body, large wings
- Hindwing often scalloped, or has a tail (Papilioninae)
- Forewing edge is transparent, without scales (Parnassiinae)
- Some caterpillars have an 'osmaterium'



© 2011 Marvin Smith

1. Pieridae - Whites

- Variable body size (small-medium)
- White, yellow and orange ground color
- Often strong sexual dimorphism
- Modified habitat by humans
- Preferred plants: leguminous & crucifers (pests)
- Green eyes



1. Pieridae - Whites

Common Pieridae species



Family Pieridae

Pierinae

Whites



Dismorphinae



Leptidea sinapis

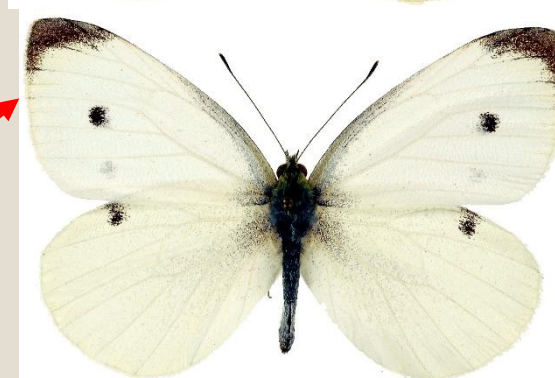
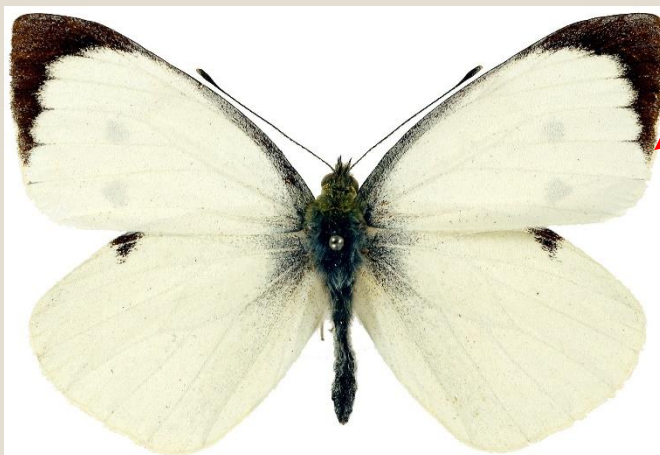
White, rounded wing
shape and slow flight

Coliadinae

Yellowish

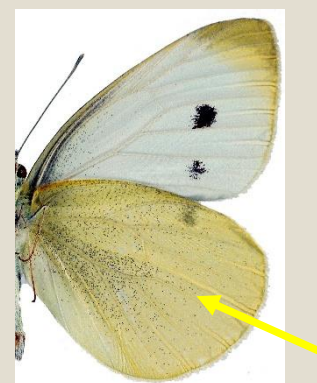


1.3 Whites - Pieridae



Pieris brassicae

Important to check the apical spot (red arrow) how long and diffuse it is in Pieris species



Pieris rapae



Pieris napi

Pierinae

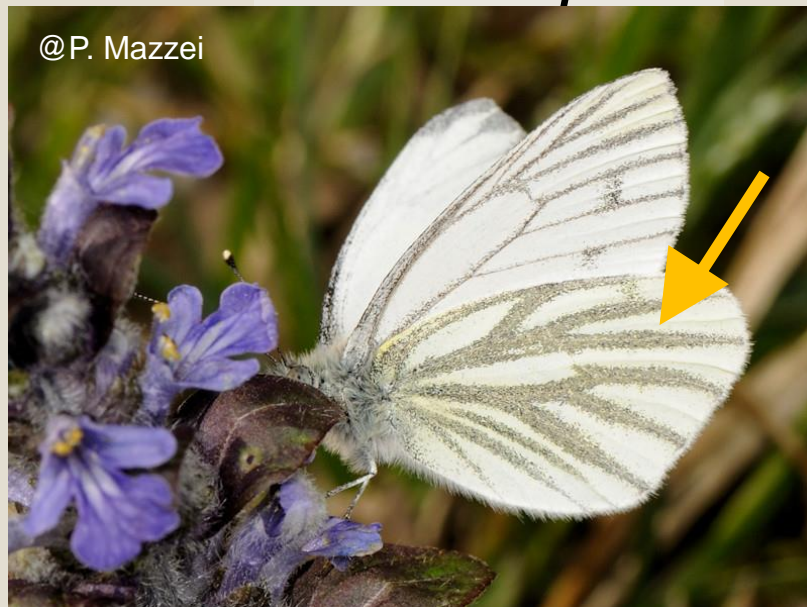
Pieris brassicae



Pieris rapae



Pieris napi



Pieris mannii



1.3 Whites - Pieridae

Example of confusing species



Pontia edusa/daplidice

On the underside, there is more green than white, green patches are large

Mickey
Mouse



Anthocharis cardamines



On the underside, there is more white than green, green patches are smaller and the pattern is fragmented

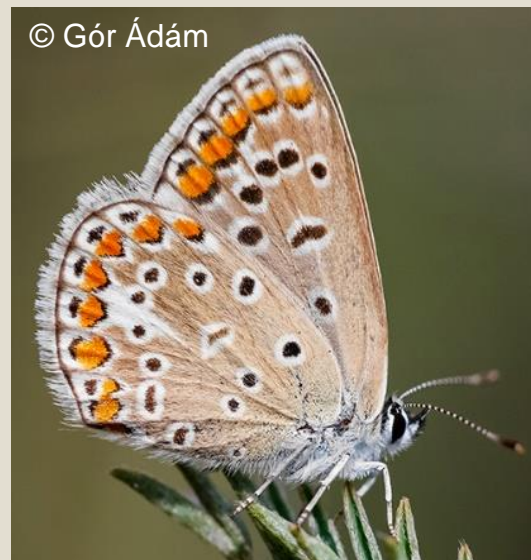
Euchloe crameri



On the underside, white shiny circles in a green background

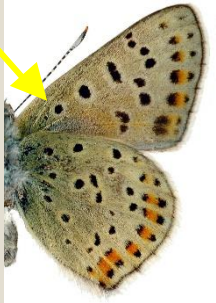
1. Family Lycaenidae

- Small or medium body size
- Sexual dimorphism
- Myrmecophily (ant relationship)
- Labial palps usually protrude forward
- Rapid flight



1.4 Family Lycaenidae

Lycaeninae



- Violet, orange or brown ground color
- Forewing underside: black spot in the basal area

Theclinae



- Brownish ground color
- Small tail
- White streak on the hindwing underside

Polyommatainae



- Blue male – brown female (not always)
- Orange spots at the edge of the underside and/or conspicuous black spots

1.4 Family Lycaenidae

Polyommatus icarus



Lycaena phlaeas



Callophrys rubi



Satyrrium ilicis

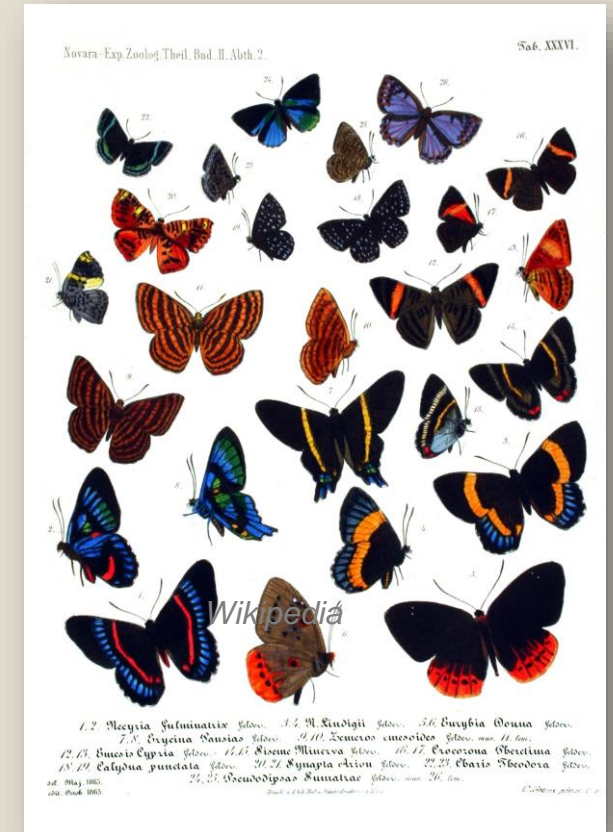
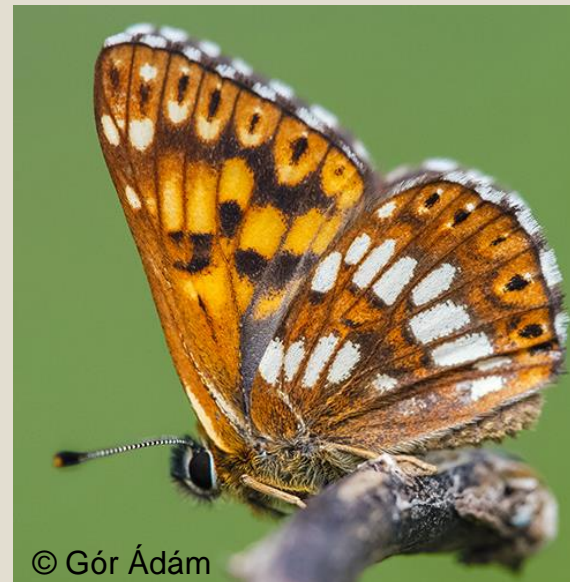


1. Family Riodinidae

- A subfamily from the tropics – Metalmarks butterflies
- Diverse family: **a single species in Europe**
- Between Nymphalidae and Lycaenidae



Duke of Burgundy – *Hamearis lucina*



Reise der Österreichischen
Fregatte Novara um die Erde (1861–1876)

1. Family Nymphalidae

- First pair of legs is vestigial, you see 'four-legged'
- Very diverse: size, shape, color (frequent orange & red), life history
- They can feed on rotten fruits (not only nectar)

Subfamilies:

- Libytheinae
- Limenitinae
- Heliconiinae
- Apaturinae
- Nymphalinae
- Satyrinae



Family Nymphalidae

Subfamily Libytheinae

Unique species in Europe - *Lybithea celtis*



Palpi are long extended ahead and hibernate as an adult

Family Nymphalidae

Subfamily Nymphalinae

- Very diverse group
- Hindwing scalloped or forewing elongated
- Black/brown ground color and orange spots and bands



Polygonia c-album



Euphydryas maturna



Melitaea cinxia



Inachis io



Vanessa atalanta

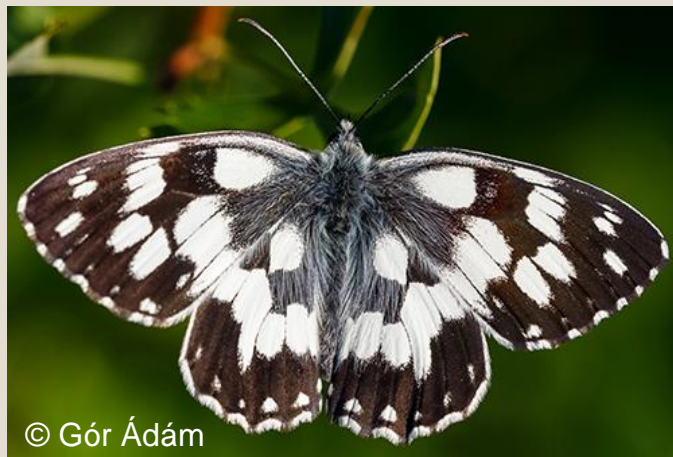


Vanessa cardui

Family Nymphalidae

Subfamily Satyrinae

- Eye-spots (single or chain)
- Mostly brownish ground-color
- Caterpillars feed mostly on grasses



Melanargia galathea



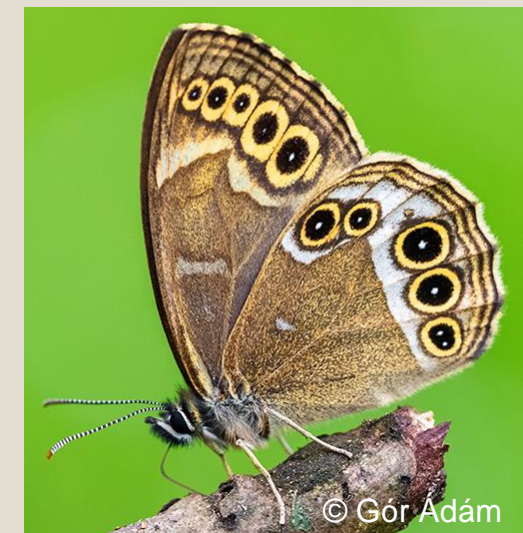
Coenonympha pamphilus



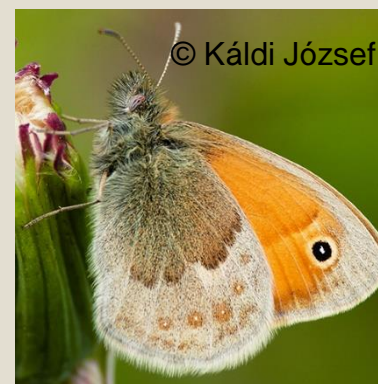
Maniola jurtina



Lasiommata megera



Lopinga achine



Two species are shown on these 10 pictures. Which specimens belong to each species? What might be the keys?



Coenonympha glycerion

Hindwing:

- Thin orange edge
- Eye-spot row, variable white spot ahead of it

Forewing:

- No eye-spot or very reduced



Coenonympha pamphilus

Hindwing:

- No orange edge
- No eye-spots, max. tiny dots; no white spot

Forewing:

- One big eye-spot



To remember: Butterfly families

Skippers - Hesperidae



Papilionidae



Whites - Pieridae



Riodinidae



Lycaenidae



Nymphalidae

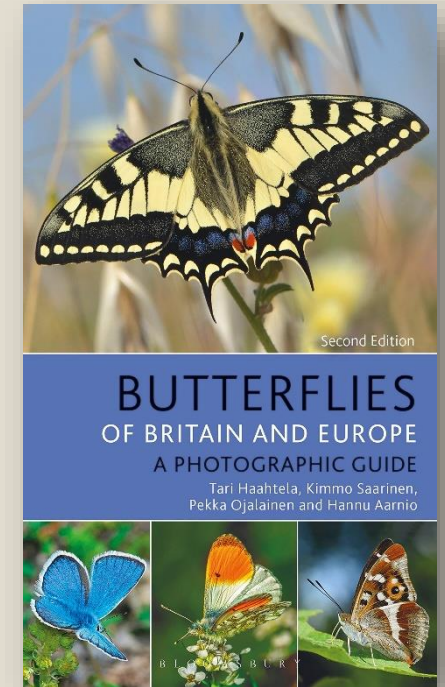
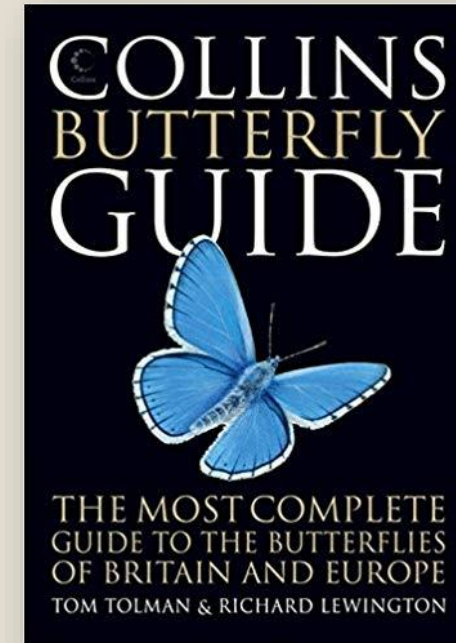
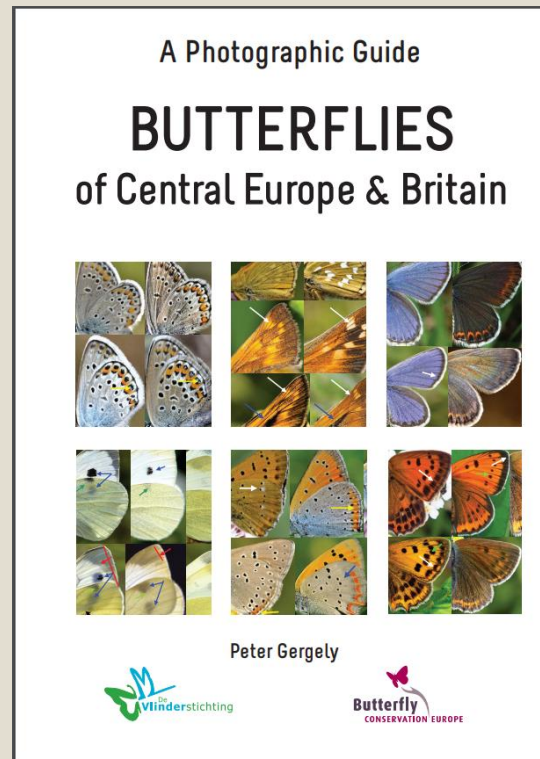


2. Guides and help

Books:

- All European species (Collins Butterfly Guide)
- Butterflies of Britain and Europe. A Photographic Guide

For better identification, check national or local books for butterflies of your surroundings




- A Photographic Guide. Butterflies of Central Europe & Britain. *Peter Gergely*
You can download the [Pdf here](#)


2. Guides and help

Websites:

- www.eurobutterflies.com by Matt Rowlings
- Leps.it (Moths and Butterflies Europe and North Africa)
- Lepiforum <http://lepiforum.de> (in German)
- [UFZ Distribution maps](#) of European butterfly species

**HELMHOLTZ**
Zentrum für Umweltforschung

European Butterflies and Moths

 GFS Verein Journal Oedippus Jahrestagungen Projekte LepiDiv Projekt Links Kontakt

Artenliste

Verbreitungskarten


WEB-GIS

Acknowledgements

LepiDiv Projekt > Verbreitungskarten

Galerie mit Verbreitungskarten europäischer Tagfalter

Aglais io - Aricia cramera	+
Aricia crassipunctus - Brenthis mofidii	+
Brintesia circe - Coenonympha glycerion	+
Coenonympha hero - Cupido argiades	+
Cupido decoloratus - Erebia lefebvrei	+
Erebia ligea - Erynnis marloyi	+
Erynnis tages - Hipparchia aristaeus	+
Hipparchia blachieri - Kirinia climene	+

**Moths and Butterflies of Europe and North Africa**
by Paolo Mazzei, Daniel Morel, Raniero Panfili


Families | Latin names | Common names | Common names | Home | Tree | Links | About | Search


Alphabetical index
Thumbnails:
all ad la pu eg


Satyrinae
Coenonymphini
Coenonympha
arcania A
arcanoides A
corinna A
darwiniana A
dorus A
elbana A
fettigii A
gardetta A
glycerion L P A
hero L P A H
iphioides A
leander A
lyllus A
oedippus A
pamphilus L A
rhodopensis A
thyrus A
tullia L P A
vaucheri A
Satyrinae Elymniini
Kirinia
climene L P A
roxelana A
Lasioommata
maera A
meadewaldoi A
megera E L P A
paramegaira A
petropolitana A
Lopinga
achine L P A
Pararge
aegeria L P A
xiphia A
xiphioides A
Satyrinae Erebiini
Erebia
aethiopella L P A
aethiops A
albergana L P A
cassioides A
christi A
disa A
dromus L P A
embla A
epiphron L P A
epistygne A
eriphyle A
euryale L A
flavofasciata A
gorge A
gorgone A
lefebvrei A
ligea A


Papilionoidea: Nymphalidae Satyrinae Coenonymphini
Coenonympha pamphilus (Linnaeus, 1758)
Small Heath
Procris, Fadet commun
Genus: **Coenonympha** Hübner, [1819] Original genus: **Papilio** Linnaeus, 1758
Synonyms (genus):
Chortobius Dunning & Pickard, 1858
Triphysa Zeller, 1850

Adult:


Adult, Vivaro (Roma), Italy, August 8, 2006
(Photo by Paolo Mazzei)


Adult, Ostia (Roma), Italy, June 6, 2005
(Photo by Sarah Gregg, Lynkos - through other eyes)


Adult, Caldara di Manziana (Roma), Italy, May 12, 2006


Adult, Sambuci (Roma), Italy, May 2002
(Photo by Ilaria Pimpinelli)



2. Guides and help

Websites:

- European Butterfly Group
<http://www.european-butterflies.org.uk/>
With pdfs of Butterfly Identification Guides for different butterflies groups



Butterfly Conservation
European Butterflies Group

Home About EBG Countries Events Holidays News Requests Species Contacts & Links

Identification Guides Identification Service European Species List

Butterfly Identification Guides

The following guides provide help with the identification of European butterfly species and are free to download as pdf's.



Brimstones
(*Gonepteryx*)

A guide to help distinguish between the following species: Brimstone [*Gonepteryx rhamni*], Powdered Brimstone [*Gonepteryx farinosa*], and Cleopatra [*Gonepteryx cleopatra*] ~ [Download \(3mb\)](#)




Large and Medium Fritillaries
(*Argynnis*, *Brenthis*, *Fabriciana*, *Issoria*, *Speyeria*)

This guide helps to separate the Large and Medium Fritillaries from the Small Fritillaries (*Boloria*, *Euphydryas* and *Melitaea*). The following species are described in detail: Cardinal [*Argynnis pandora*], Silver-washed Fritillary [*Argynnis paphia*], Dark Green Fritillary [*Speyeria aglaja*], High Brown Fritillary [*Fabriciana adippe*], Niobe Fritillary [*Fabriciana niobe*], Queen of Spain Fritillary [*Issoria lathonia*], Marbled Fritillary [*Brenthis daphne*], Lesser Marbled Fritillary [*Brenthis ino*], Twin-spot Fritillary [*Brenthis hecate*], Corsican Fritillary [*Fabriciana elisa*], Pallas's Fritillary [*Argynnis laodice*] ~ Download : [high resolution \(large file size - 16mb\)](#) or [low resolution \(small file size - 4mb\)](#)



Small Fritillaries
f. *Boloria*

This guide to *Boloria* is the first of three covering the Small Fritillaries. All fifteen species of *Boloria* are covered with an identification sequence taking you through a process of elimination and determination by habitat and distribution. Potentially difficult comparisons like Shepherd's Fritillary [*Boloria pales*] and Mountain Fritillary [*Boloria napaea*] are dealt with in detail. ~ Download : [high resolution \(large file size - 22mb\)](#) or [low resolution \(small file size - 6mb\)](#)



Identification Guide: Small Fritillaries - Boloria

Distinguishing Boloria by size

Identifying fritillaries* in Europe is difficult due to there being over 40 superficially similar species. As a starting point they are usually roughly divided by size into: 'large' fritillaries [*Argynnis*, *Fabriciana*, *Speyeria*], 'medium-sized' fritillaries [*Brenthis*, *Issoria*], and 'small' fritillaries [*Boloria*, *Euphydryas*, *Melitaea*]. The eleven large and medium sized are described in a separate guide. Future guides will cover the other small fritillaries, i.e. *Euphydryas* and *Melitaea*.

Estimating size is a useful way to begin the identification process. *Argynnis*, *Fabriciana* and *Speyeria* species, for example, are usually noticeably larger (see diagram opposite), whilst the medium sized *Brenthis* and *Issoria* species are intermediates with *Brenthis daphne* sometimes similar in size to the large species and *Brenthis ino* and *Brenthis hecate* comparable to the 'small' fritillaries.

A comparison of approximate average sizes*

Size	Species	Approximate Average Size
LARGE	[<i>Argynnis</i> , <i>Fabriciana</i> , <i>Speyeria</i>]	23-40mm
MEDIUM	[<i>Brenthis</i> , <i>Issoria</i>]	17-26mm
SMALL	[<i>Boloria</i> , <i>Euphydryas</i> , <i>Melitaea</i>]	14-24mm

* If this page is displayed or printed at A4 size

Distinguishing Boloria from the other 'small' fritillaries

To help separate the 15 *Boloria* species from the other 'small' fritillaries we can compare the general appearance of their uppersides. From the photos opposite it is noticeable that *Euphydryas* and *Melitaea* species usually have uppersides resembling a grid or net-like pattern, whereas *Boloria* species have an open pattern of marks and rounded spots. Also, *Euphydryas* tend to be more colourful and *Melitaea* duller than *Boloria*. Most are therefore unlikely to be confused with any of the species in this guide. See page 5 for more guidance. * This is an arbitrary grouping, see note on page 6.

Distinguishing Boloria from the 'large' and 'medium-sized' fritillaries

Boloria are usually noticeably smaller than all the 'large' fritillaries making identification relatively straightforward. However, the 'medium-sized' fritillaries, *Brenthis* and *Issoria*, can be a similar size to *Boloria*. Use the guidance below to help identify *Boloria*.


Upperside

Boloria species have similar uppersides to the 'large' and 'medium-sized' fritillaries, all having an open pattern of marks and rounded spots. To differentiate look for:

A prominent round black spot here. This is distinctive and found on the species of *Boloria* that are fairly widespread in Europe. This spot is not present on all the 'large' and 'medium-sized' fritillaries.

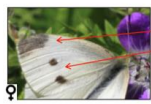


Underside

A detailed comparison of the underside hind-wing will readily distinguish *Boloria* from the four 'medium-sized' fritillaries. Most *Boloria* have some distinct white marks whilst the *Brenthis* species have none. *Issoria lathonia* has silver marks but these are unmistakably large and bright. See the comparison photos below.



Identification Guide: Pieris

Firstly, use these diagnostic features to determine if it is a Pieris. Page 3 shows similar species and second broods which may confuse.


FEMALE Pieris fore-wing upperside	MALE Pieris fore-wing upperside	MALE & FEMALE Pieris underside
 <p>All females usually have dark wing-tips and two black-grey spots on the fore-wing. [Note: Krueper's Small White has only one spot]</p>	 <p>All males usually have dark wing-tips and one or no black-grey spots on fore-wing</p>	 <p>Fore-wings usually have yellowish wing-tips Hind-wings are creamy-white or have streaks/ blotches of greenish grey.</p>

Next, establish if it is one of the three very common species of Pieris below which are found THROUGHOUT MAINLAND EUROPE. If unsure, then follow notes to the numbered species on the next page which are mainly found LOCALLY in SOUTHERN EUROPE.

1. Large White [*Pieris brassicae*]

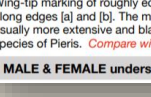
Size is main indicator, usually significantly larger than all other species of Pieris

MALE & FEMALE upperside



Wing-tip marking of roughly equal length along edges [a] and [b]. The marking is usually more extensive and blacker than other species of Pieris. Compare with Small White

MALE & FEMALE underside




Wing-tip marking of roughly equal length along edges [a] and [b]. The marking is usually more extensive and blacker than other species of Pieris. Compare with Small White

2. Small White [*Pieris rapae*]

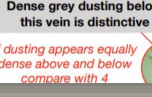
Usually significantly smaller than Large White

MALE & FEMALE upperside



Wing-tip marking fainter than Large White. Usually ends around here, well above the vein marked [a] If mark goes further down, compare with 4

MALE & FEMALE underside

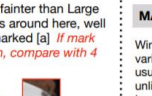


Dense grey dusting below this vein is distinctive
If dusting appears equally dense above and below compare with 4

3. Green-veined White [*Pieris napi*]


Similar in size to Small White

MALE & FEMALE upperside



Wing-tip markings variable but veins usually lined greyish unlike Small and Large White.
[Note: Around the Arctic Circle females may be much darker, similar to 7]

MALE & FEMALE underside



Prominent greenish grey veins on hind-wing are distinctive and easily distinguished from Small and Large White

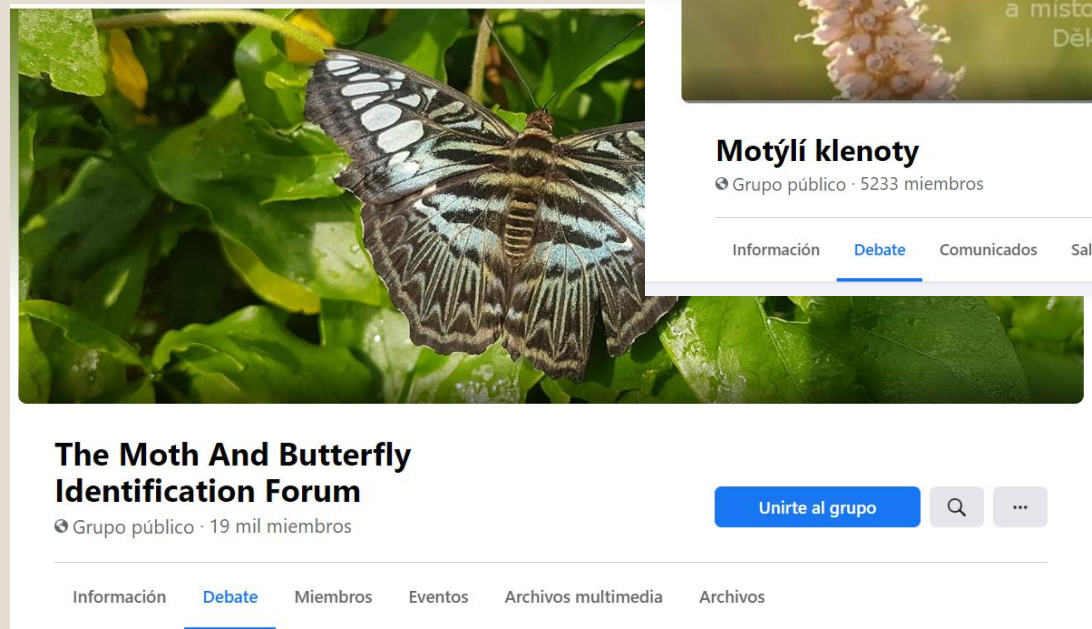
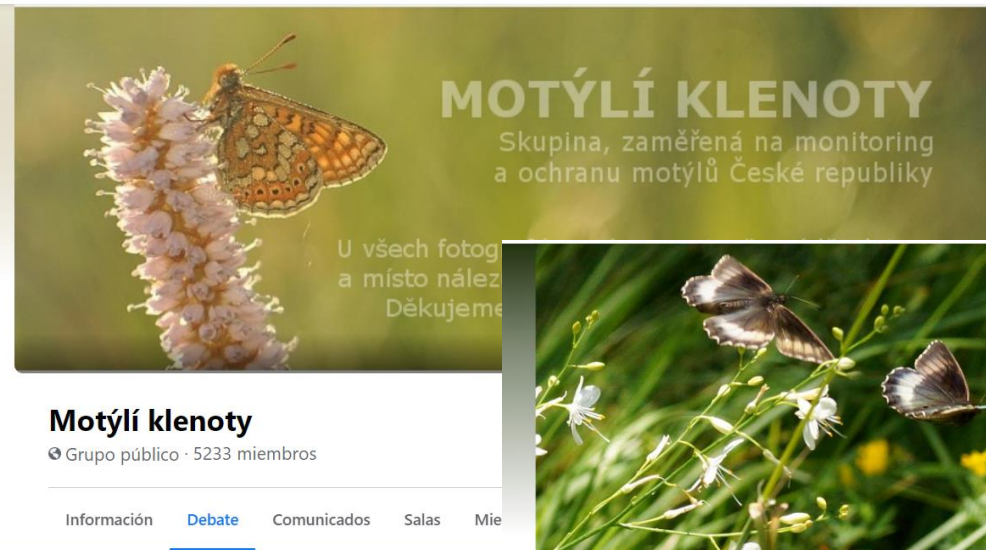
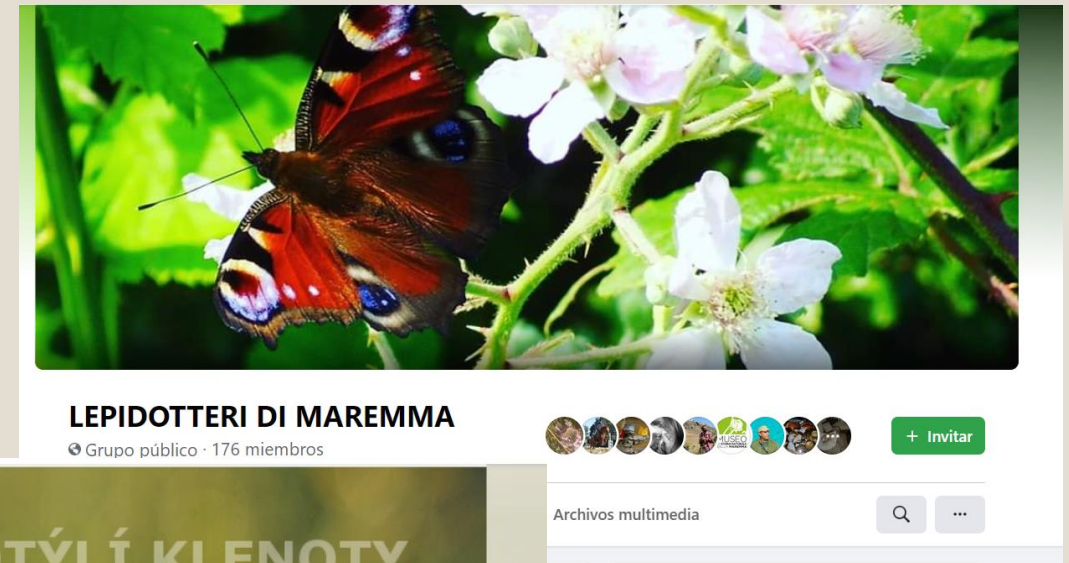
2. Guides and help

Facebook Groups:



Social media helps in butterfly identification and create a butterfly community

- National groups
- Local pages



Acknowledgement

Photos of mounted museum specimens were made by Gábor Ronkay and the Hungarian Natural History Museum is the copyright owner.
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Authors: Adam Korosi for the creation of this material and Cristina G. Sevilleja



European Butterfly
Monitoring Scheme

