



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.

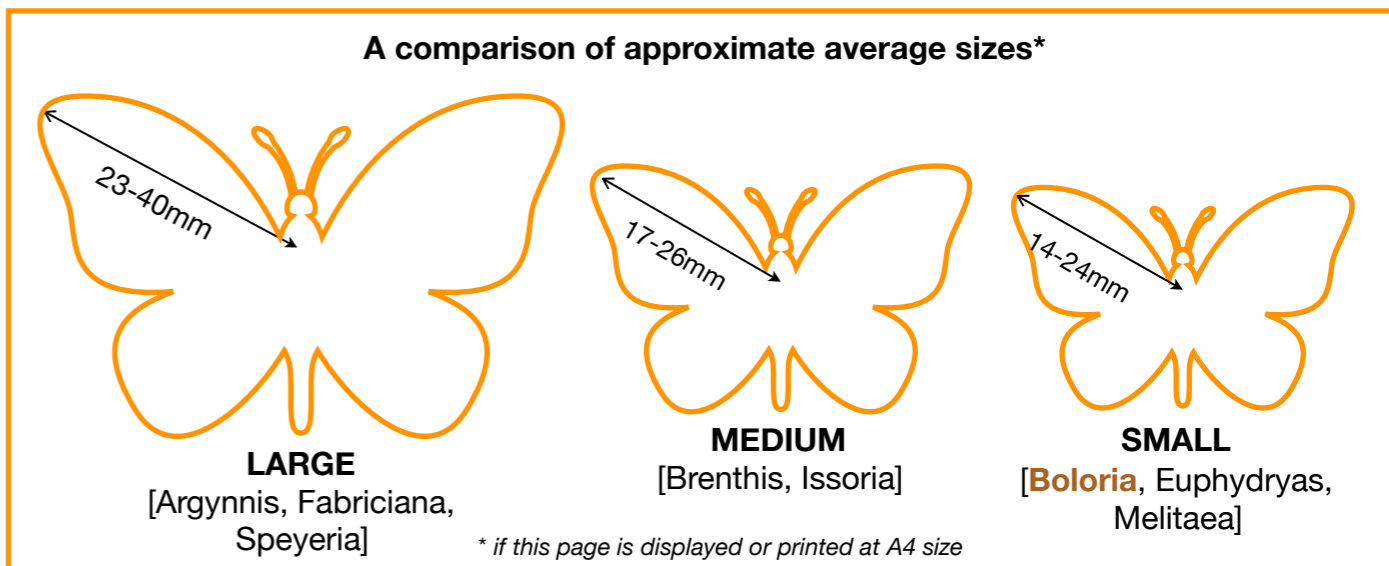
Distinguishing Boloria from the other 'small' fritillaries

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.



Euphydryas



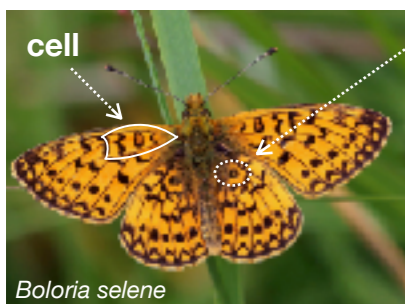
Boloria



Melitaea

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:



Boloria selene

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.**

Note: This spot is also not visible on most of the more localised Boloria species found in northern Europe or mountainous habitats in central Europe.



The wavy black marks inside this area called the 'cell' are **reasonably consistent on the 'large' and 'medium-sized' fritillaries.** This photo of *Brenthis ino* illustrates the usual appearance of these markings.

On Boloria species the markings inside the 'cell' are very variable. **If present, they are usually noticeably different, being either thicker, more incomplete or less sinuous.** See *Boloria selene* upperside photo above left.



Brenthis ino

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.



Boloria euphrosyne



Boloria dia



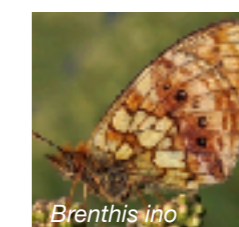
Boloria selene



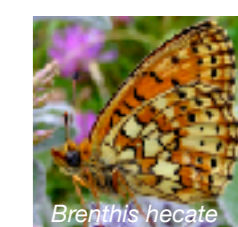
Issoria lathonia



Brenthis daphne



Brenthis ino



Brenthis hecate

To simplify the identification process the fifteen fritillaries in this guide are divided into four groups: A B C D, according to their distribution, as shown below. Identification proceeds by looking at each group in turn until you find your butterfly.

Distribution See maps on page 6 Altitude	A 1. Pearl-bordered 2. Small Pearl-bordered 3. Weaver's Reasonably common and widespread in Europe Sea level to 1500-2200m	B 4. Titania's 5. Cranberry 6. Bog Scattered colonies across Europe Sea level to 2000m	C 7. Mountain 8. Shepherd's 9. Thor's 10. Balkan Scattered colonies in European mountains 800-3000m	D 11. Freija's 12. Frigga's 13. Arctic 14. Polar 15. Dusky-winged Fennoscandia and Baltic States only
--	--	--	--	--

Group A

First, check if your butterfly is in this group. If you can see **prominent black spots here** then it is either one of the three widespread species below or Titania's Fritillary on next page. Continue to Group B if you cannot identify your butterfly in this group.



1, 2, 3, and 4 are the only species in this guide on which these spots are usually clearly visible.

1. Pearl-bordered Fritillary [*Boloria euphrosyne*]

2. Small Pearl-bordered Fritillary [*Boloria selene*]

3. Weaver's Fritillary [*Boloria dia*]

The MALE & FEMALE uppersides of both species have similar markings which are variable. Differentiate by:

Shape of these markings bordering all wings. Best seen on the hind-wings.

flat edges vs inward pointing edges

Note: Some females can have paler coloured markings at the wing edges. Occasionally, almost white.

Upperside markings noticeably bold, especially bigger and rounder spots here on the hindwing.

Male and female markings variable but usually darker than 1 and 2.

MALE & FEMALE underside hind-wing displays the main diagnostic features of these two species. Differentiate by:

Number of white marks in this area of wing

Two marks vs Several marks

Colour of spots in curved row from a to b

Usually reddish with at least one spot having a pale centre vs Usually solid black

A white patch here distinguishes *selene* from *euphrosyne*.

MALE & FEMALE underside hind-wing displays main diagnostic features

Apex of hind-wing is usually sharply angled. Compare 1 and 2

Violet colouring in this area. Compare 1, 2

Shape of this white mark is distinctive and unique. Compare 1 and 2

This spot is pale centred. Compare 1 and 2

Note: In northern areas both species have darker upperside markings and duller undersides.

Group B

This group includes the more local species found from sea level to c.1500-2000m. Use the references to compare your butterfly with Groups A and C, noting that [i] only *Titania's Fritillary* has the upperside black spots characteristic of all in Group A, [ii] all in Group C are only found above 800m. If you cannot identify your butterfly in groups A and B and it was found above 800m then continue to Group C. Otherwise, see page 5 for notes on similar species or if your butterfly was found in Fennoscandia and Baltic States go to Group D.

4. Titania's Fritillary [*Boloria titania*]



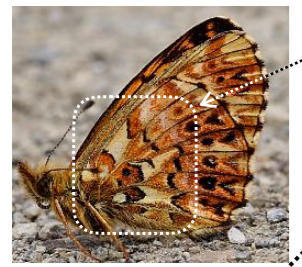
Upperside is similar to *dia* in Group A, but *titania* is usually larger.

Wing edges are normally darker than *dia*.

The prominent black spots here can sometimes be obscured.



MALE & FEMALE underside hind-wing displays main diagnostic features



This mark shaped like an elongated X. Compare with 3

This spot is black. Sometimes with a white outline. Compare with 3 and 5

Usually a conspicuous dark zig-zag line from a to b. Compare with 3 and 5

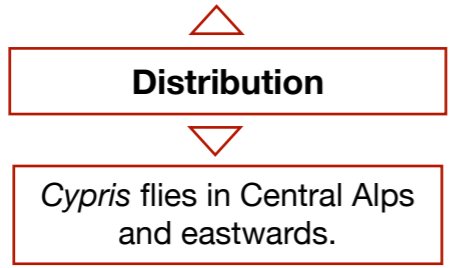
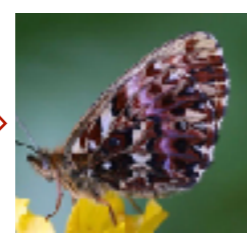
Titania flies in Massif Central, south-western Central Alps, Baltic States.

4a. subspecies *cypris*

Males and females of this subspecies usually have brighter uppersides with bolder markings than *titania*.



Underside is noticeably different. *Cypris* is duller with a tinge of violet, sometimes obscuring many of the pale markings.

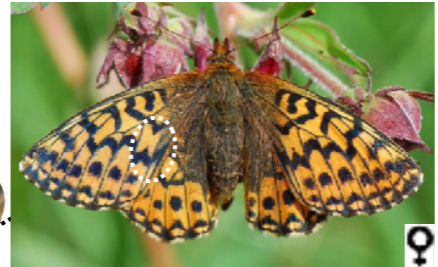


5. Cranberry Fritillary [*Boloria aquilonaris*]

Similar to *napaea* and *pales* in Group C but unlikely to be confused as *aquilonaris* frequents bogs and wet heaths where its foodplant Cranberry [*Vaccinium oxycoccos*] grows, usually close to standing water. Such areas are rarely found in the high altitude habitat of *napaea* and *pales*.



No prominent black spot visible here on male or female. Compare 1, 2, 3 and 4



These marks, like opposing arrowheads, are usually bold and clear compared to 7, 8, 8a where they may appear less distinct. Frequently the arrowheads become linked by a dark line. Also compare 6.

MALE & FEMALE underside



Bold, clear dark marks on fore-wing. Compare 7, 8 and 8a



A white centred spot here distinguishes from *euphrosyne* and *selene* in Group A, which have a black centred spot in this position.

Behaviour

Aquilonaris can usually be found roosting at night or in poor weather on the flowerheads of Marsh Cinquefoil [*Potentilla palustris*]



6. Bog Fritillary [*Boloria eunomia*]

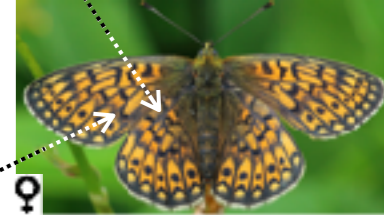
Male upperside is usually brighter with more delicate markings than other *Boloria*. Female is duller with bolder, darker markings.



No prominent black spot here on male or female. Compare 1, 2, 3, 4



This mark pointing outwards is distinctive. Compare 5, 7, 8, 8a



MALE & FEMALE underside hind-wing is distinctive



Complete row of consistently coloured spots from a to b. Compare 9

Unlike all other species in this guide the underside hind-wing has a complete row of spots with pale centres and dark outlines.

6a. subspecies *ossiana*

Flies in Fennoscandia, Baltic States, and northeastern Poland.



Ossiana is usually smaller with heavier upperside markings.

Majority of marks on underside hind-wing are white rather than pale yellow as in *eunomia* above.



Group C

This group includes more local species **only found above 800m**. A close comparison of the underside hind-wings will differentiate from species in Groups A and B. Also, note that **none of this group have the upperside black spots seen on 1, 2, 3, and 4**. Finally, if unable to identify your butterfly and it was found in Fennoscandia/Baltic States then go to Group D. Otherwise, see page 5 for similar species.

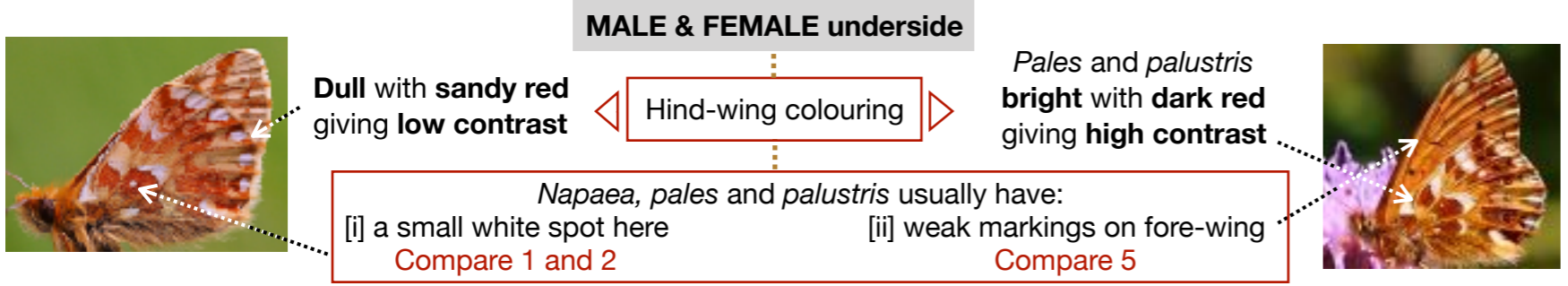
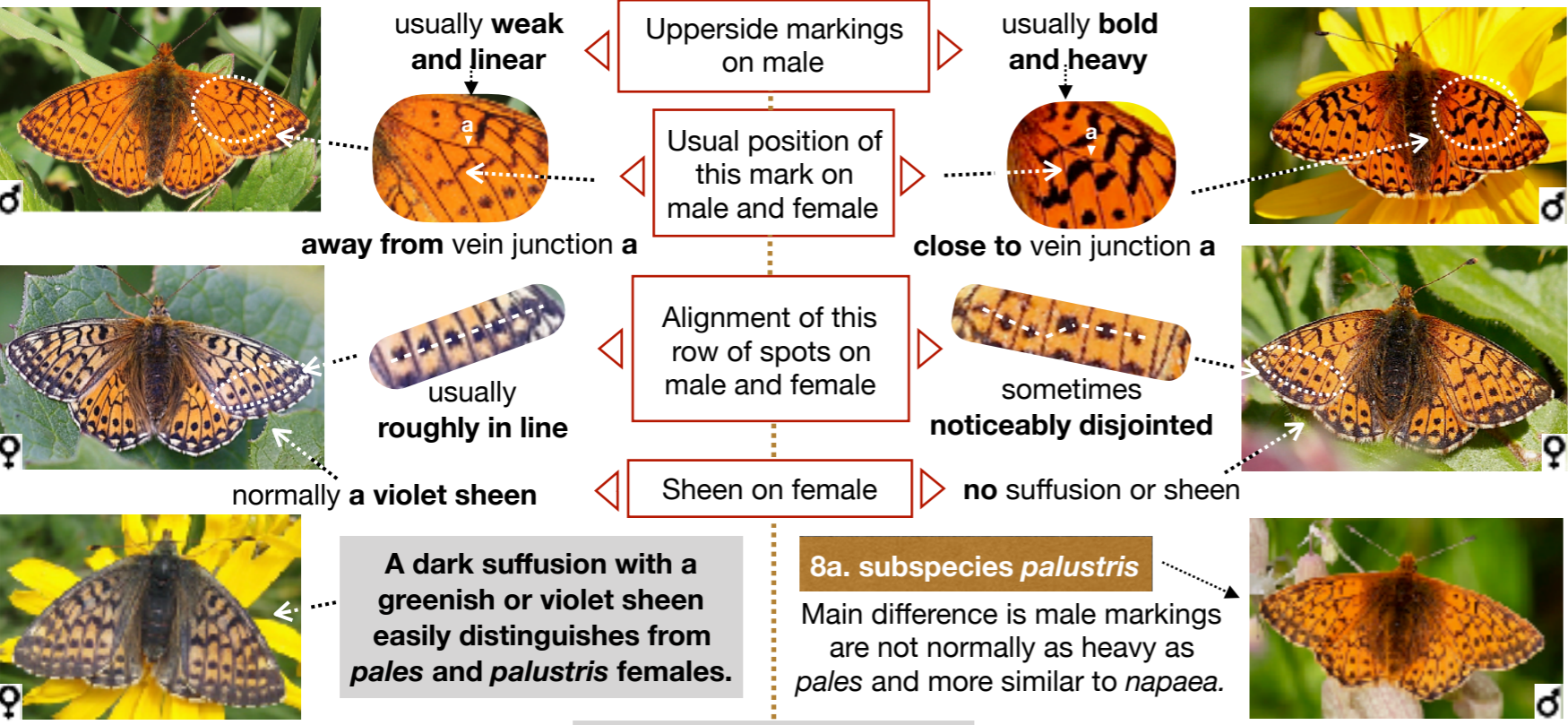
7. Mountain Fritillary [*Boloria napaea*]

8. Shepherd's Fritillary [*Boloria pales*]

9. Thor's Fritillary [*Boloria thore*]

These two species often fly together in alpine grassland, usually above 1500m*, in geographically and genetically isolated groups which frequently display different characteristics. **They can be difficult to separate, often only identifiable by examining genitalia**** Although not always present, the points below should help in identification.

Distribution [See page 6 for maps] *Napaea* and *pales* have a limited overlap in the Central Alps; both being found locally north of the Rhone Valley in Switzerland and in the Hohe Tauern in Austria. *Pales* is gradually replaced by subspecies *palustris* in most of the southern and western Central Alps, west of the Brenner Pass.



7a. subspecies *pyreneorientalis*

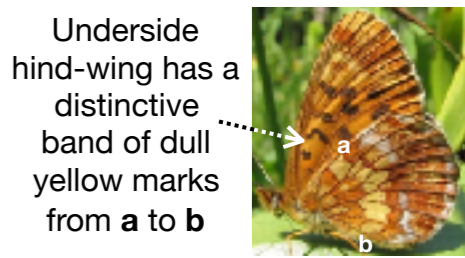
8b. subspecies *pyrenesmiscens*

There is a very limited overlap of subspecies *napaea pyreneorientalis* and *pales pyrenesmiscens* in the Eastern Pyrenees around Val d'Eyne. The differences are subtle. Look for the points above to differentiate.



Male and female have similar upper and undersides. Female is larger than male.

Dark upperside very distinctive with large, heavy markings that tend to merge.



9a. subspecies *borealis*

Borealis flies in western and northern Fennoscandia.



Upperside is usually brighter, than *thore* with underside paler.

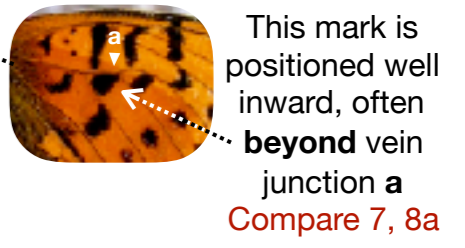
10. Balkan Fritillary [*Boloria graeca*]

Main distribution is in Balkan Mountains [see page 6]. However, *graeca* also flies with 7 and 8a in southwestern Central Alps.

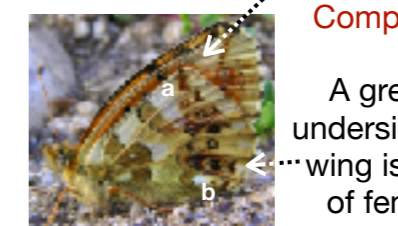
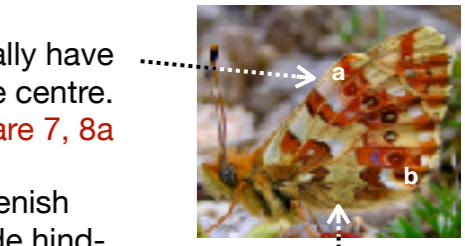


Male and female have similarly marked upper and undersides.

Upperside markings normally bolder and heavier than 7 and 8a



All spots from **a** to **b** usually have some semblance of a pale centre. (Compare 7, 8a)



A greenish underside hind-wing is typical of females. Greenish marbling here is distinctive. (Compare 7, 8a)

* *Napaea* is found at sea level in Fennoscandia. ** See page 6 for link to guidance notes.

This group includes the five species **ONLY FOUND in Fennoscandia and the Baltic States**. A detailed comparison of the underside hind-wing of any of this group with the other *Boloria* which fly in this area, i.e. 1, 2, 4, 5, 6a, 7, 9a, should differentiate. Most species present in this part of Europe are usually found in sheltered woodland and bogs but 13, 14 and 15 are restricted to bleak, open Arctic regions where they might be found flying with 7 and 11.

11. Freija's Fritillary
[*Boloria freija*]

Male and female similarly marked



Jagged marks along wing edges **Compare 12**



Black zig-zag line here **Compare 4**



These markings resemble a leaping fish **Compare 13, 14**

12. Frigga's Fritillary
[*Boloria frigga*]

Male and female similarly marked



Smooth linear marks along wing edges. **Compare 11**

Underside hind-wing unlike any other species in this Group.



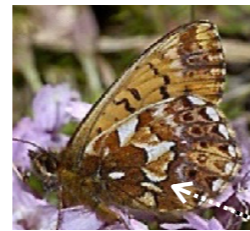
Outer part of hind-wing is lilac coloured

13. Arctic Fritillary
[*Boloria chariclea*]

Male and female similarly marked



Smaller markings reveal more ground colour. **Compare 11, 12 and 14**



Shape of this mark is distinctive.
Compare 11 and 14

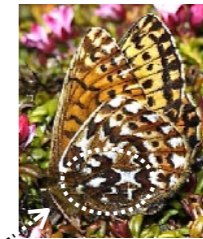
14. Polar Fritillary
[*Boloria polaris*]

Male and female similarly marked



Smooth marks along wing edges. **Compare 11**

This mark is a bold X shape **Compare 11, 13**



Two white spots in this area. **Compare 11, 13**

15. Dusky-winged Fritillary
[*Boloria improba*]



Easily identified as both male and female have upper and undersides which are much dusker than all other species in this guide.

They are also noticeably smaller and only fly in Arctic Fennoscandia.



Distinguishing the species in this guide from the other 'small' fritillaries, i.e. Euphydryas and Melitaea.

Upperside

As illustrated on page 1 the upperside of *Melitaea* and *Euphydryas* species have a distinctive net-like pattern of markings which is quite different from all species in this guide. Three *Melitaea* species that might possibly cause confusion are shown below, i.e. *aetherie*, *didyma*, and *trivia*. A detailed comparison should identify.



Melitaea aetherie



Melitaea didyma



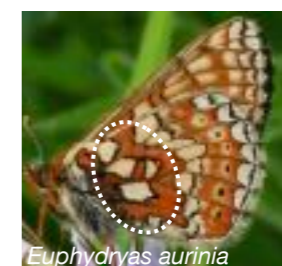
Melitaea trivia

Underside hind-wing

On most *Euphydryas* and *Melitaea* the area of the underside hind-wing ringed in white on the photos below, usually contains a pattern of pale markings quite different from any of the species in this guide. A close comparison should readily distinguish.



Melitaea cinxia



Euphydryas aurinia



Melitaea diamina

Distribution Maps

● Up to 1950 ● 1951 - 1980 ● After 1980

Group A

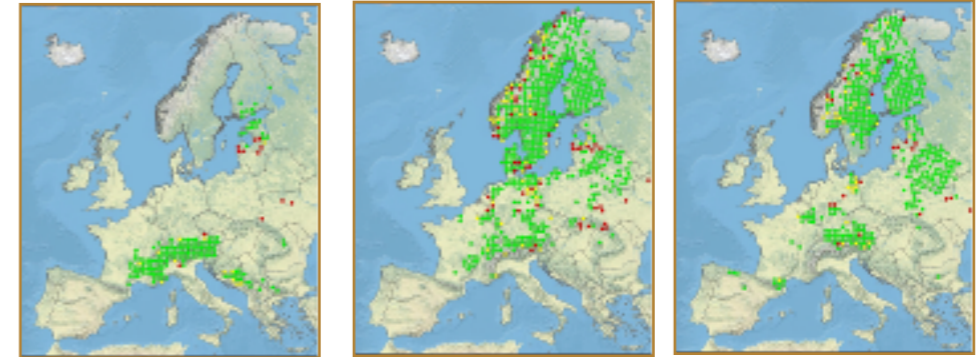


Pearl-bordered
Fritillary

Small Pearl-
bordered Fritillary

Weaver's
Fritillary

Group B



Titania's
Fritillary

Cranberry
Fritillary

Bog
Fritillary

Group C



Mountain
Fritillary

Shepherd's
Fritillary

Thor's
Fritillary

Balkan
Fritillary

Group D



Freija's
Fritillary

Frigga's
Fritillary

Arctic
Fritillary

Polar
Fritillary

Dusky-winged
Fritillary

The distribution maps are reproduced by kind permission of LepiDiv. For more information please visit LepiDiv

Fritillaries: It should be noted that 'fritillaries' is an arbitrary English term embracing over forty similar looking species from two different subfamilies: Heliconiinae and Nymphalinae.

For more information on all aspects of European butterflies please go to european-butterflies.org.uk including: ■ The other Identification Guides in this series. Free to download at EBG Identification Guides ■ Guidance notes on identification by study of genitalia. See page 11 of EBG Newsletter No 7

Guide designed by Bill Raymond.

With special thanks for information and photographs to Bernard Watts from www.butterflyeurope.co.uk,

Also, thanks for photographs to: Matt Rowlings from eurobutterflies.com, Roger Gibbons from butterfliesoffrance.com, Vincent Baudraz from lepido.ch, and Nick Greatorex-Davies from bulgarialeps.com