

The following pages on

Maculinea alcon (Alcon Blue)

are an unmodified extract from chapter 5.12 of the publication *EUROPEAN BUTTERFLIES: A PORTRAIT IN PHOTOGRAPHS*.

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The **notation** used for identifying wing-pattern elements is also available as a free download from the above web-site.

Because chapter 5.12 contains pages on *Maculinea arion* (Large Blue), *M. telejus* (Scarce Large Blue) and *M. nausithous* (Dusky Large Blue), some **cross-references** in the present extract cannot be followed.

Introduction

Taxonomy and Systematics

The four species in the group are:

Maculinea arion (Large Blue);

Maculinea alcon (Alcon Blue);

Maculinea telejus (Scarce Large Blue);

Maculinea nausithous (Dusky Large Blue).

There is also a fifth taxon in Europe, *rebeli*, with controversial status. It has been regarded as a subspecies of *M. alcon*, which it resembles, or as a distinct species. However, recent studies have concluded there is no genetic reason to separate taxon *rebeli* from taxon *alcon* at species rank. I shall discuss this point more fully in the section on *M. alcon*, where taxon *rebeli* is included.

All the species range across Europe reaching Central Asia (*M. alcon* and *M. nausithous*), and the Far East (*M. arion* and *M. telejus*).

As described in ch. 5.0, there seems to be no established phyletic case for the recent trend of including the present four *Maculinea* species in the genus *Glaucopsyche*. The 'true' *Glaucopsyche* species are dealt with separately in the Green-underside Blue Group, ch. 5.13, an arrangement which fairly reflects the very marked difference in appearance between those species and the species in the present group.



M. nausithous



M. arion



M. alcon



M. telejus

Large Blue Group

General

As their common name implies, the species in this group are large, with wing-spans *up to* twice those in the Short-tailed and Little Blue Group (*Cupido* spp) which are some of the smaller species. In the field the difference appears much larger than a mere factor of two, presumably because the corresponding factor of four in wing-area is what impresses the eye when the insects are in flight.

The association of Polyommatinae spp with ants is at its extreme in the *Maculinea* spp which are parasitic on ants, usually *Myrmica* spp. The *Maculinea* larvae (and other stages) spend part of their life in the ants' nests where they develop at the expense of their larvae. In the case of *M. alcon*, the ants feed the butterfly larvae to the detriment, often extreme, of their own. The larvae of the other three species devour the ants' larvae.

The extreme relationship with ants is one of the common factors that unites the *Maculinea* species. Other similarities between the species are: their generally large size, all being larger than most other Polyommatinae species in Europe; and the uns pattern of spotting that is to some extent similar, particularly in *M. arion*, *M. alcon*, and *M. telejus*, as shown below. In particular there are no uns submarginal orange marks.

Apart from the above similarities, no other features are consistently similar in the present group. Interestingly, the only species in the present group using the same foodplant are *M. telejus* and *M. nausithous*, but the latter has the least similar appearance of all.

Overview

The unss of *M. arion*, *M. alcon* and *M. telejus* have standard antediscal and postdiscal spots, and disco-cellular marks. The submarginal bands consist of more-or-less complete double rows of black marks without orange marks between them. There is also some degree of laddering in the fringes.

The latter two features are much bolder on *M. arion* and so, together with its larger size, it is easy to distinguish.

The unss of *M. alcon* and *M. telejus* are very similar, but the more sharply curved row of postdiscal spots on both wings of *M. alcon* compared to *M. telejus* is a useful distinguishing feature, nearly always reliable. It is shown in more detail in the section on *M. telejus*.

The uns ground-colours and the amount of basal blue flush are unreliable ways to discriminate between *M. alcon* and *M. telejus*.

M. nausithous, however, is quite different: there are no antediscal or submarginal spots and the uns ground-colour is medium- to dark-brown.

Alcon Blue**Large Blue Group*****Maculinea alcon*****Taxonomy and Systematics**

I shall treat *M. alcon* as having two subspecies in Europe:

M. a. alcon;
M. a. rebeli.

There is, however, some difficulty in deciding how to regard these very closely related and similar taxa.

One well established fact is that most races of the *alcon*-complex use one of two different foodplants, *Gentiana* spp that favour different habitats (see below). Consequently, based on food-



plant together with habitat, the *alcon*-complex has been regarded as consisting of two taxa, *alcon* and *rebeli*. The latter has been treated by some authors as a subspecies of *M. alcon* or by others as a distinct species. However, as mentioned in the Introduction, recent genetic studies by Als *et al* (2004) have found no genetic

reason to separate taxon *alcon* and taxon *rebeli* at species level. I therefore assume taxon *alcon* and taxon *rebeli* are the same species, both being *M. alcon*.

A second fact is that taxon *alcon* exists in scattered populations across Europe as does taxon *rebeli*. Although the known sites for taxon *alcon* and taxon *rebeli* are different, their overall distributions are largely overlapping. This does not conform to the common idea of geographical subspecies occupying two entirely different geographical regions where they have some consistent morphological difference(s), but does conform to another type of subspecies, the ecological subspecies (eco-subspecies) discussed in the General Introduction. It may be added that it seems inappropriate to think of taxon *rebeli* as a form of *M. alcon* because neither is in any obvious way subordinate to the other, as also discussed in the General Introduction.

Therefore, I suggest, if one wishes to retain the idea that there is a distinction worth retaining on the basis of foodplant and habitat, one should treat taxon *rebeli* as an eco-subspecies of *M. alcon* as is done here. Taxon *alcon* then becomes the nominate subspecies.

In addition to differences in habitat and foodplant, there are reportedly differences in the wing-patterns of ssp *alcon* and ssp *rebeli*, but in my experience these are not entirely consistent. This is recognised by Bálint (1996) who names two taxa in the Carpathian Basin related to *M. alcon*, taxon *tolistus* and taxon *xerophila*, with certain characteristics that distinguish them from either of the above subspecies of *M. alcon* as they appear in western Europe. I



shall suppose these taxa to be local races of one or other of the above subspecies of *M. alcon*.

One reason for recognising taxon *alcon* and taxon *rebeli* as subspecies here is to enable some exploration of whether they really are consistently different in appearance.

Distribution

M. alcon ranges from northern Spain and France across most of Europe south of the Baltic, through the Balkans to northern Greece and into Asia. It is found north of the Baltic in southern Sweden, but is absent from most of Italy and the Mediterranean Islands.

Foodplant and Habitat

The foodplant is one of several *Gentiana* spp, particularly *G. pneumonanthe* (Marsh Gentian) in bogs and marshes or *G. cruciata* (Cross Gentian) in drier, grassy areas. Less commonly, the foodplant may be *G. germanica* (Chiltern Gentian) found only in calcareous, dry habitats.

Thus, if one adopts the view that there are two eco-subspecies, *M. alcon alcon* is found in damp habitats using *G. pneumonanthe* and *M. alcon rebeli* is found in drier areas using *G. cruciata* or, sometimes, *G. germanica*. Another consequence of the habitat types is that colonies of ssp *alcon* are most commonly found at low altitude, and ssp *rebeli* at higher altitude.

Flight-time

The single brood flies from late June to early August, depending on location.

Variation, Identification and Similar Species

The two subspecies of *M. alcon* are similar.

The male ups has medium-blue ground-colour with reasonably narrow and uniform dark wing-borders and no postdiscal dark spots. The fringes are white and without any perceptible laddering.

The female ups is a deeper-blue, heavily and extensively suffused with dark scaling in the discal, postdiscal and submarginal regions. There are a number of postdiscal dark spots, usually obscured by the dark scaling. Some fringe-laddering may be visible.

The unsex of both sexes are similar. The postdiscal dark spots, outlined in white in the usual way, are quite small on both wings. There are also some similar unhw antediscal spots and a disco-cellular mark on both wings. There are partial submarginal bands on both wings: the row of inner dark marks is a complete series of black spots; the outer row is effectively absent; and there are no orange marks.



Maculinea alcon

Large Blue Group

Alcon Blue

In my experience, the uns ground-colour varies from pale-grey to medium-brown, with the latter being more common in eastern Europe.

Certain supposed differences between ssp *alcon* and ssp *rebeli* are described by most authors. Except where stated otherwise, the following list is taken from Higgins and Riley (1980).

On the male ups: ssp *alcon* has a dull, pale, dusty-blue ground-colour and dark borders, one to two mm wide; ssp *rebeli* has a brighter-blue ground-colour with narrower and better-defined borders, and the fringes often have slight laddering.

On the uns of both sexes: ssp *alcon* has a light-brown ground-colour and no basal green-blue flush; ssp *rebeli* has a grey-brown ground-colour, with more-distinct spots and a slight basal flush. A further feature (Fernández-Rubio, 1991) is that in Spain the uns spots are larger on ssp *alcon* than on ssp *rebeli*.

On the female ups: ssp *alcon* has a heavy, dark suffusion, sometimes with dark-blue in the basal region and obscure disco-cellular and postdiscal spots on the upfw; ssp *rebeli* has a basal blue flush and distinct disco-cellular and postdiscal spots on the upfw.

In the rest of this section, the above three paragraphs will be referred to as the standard description of the differences between the subspecies. It is not wholly successful, since a considerable number of inconsistencies can be pointed out in the pictures that follow. Because of these contradictions, it seems that wing-patterns are an unreliable way of separating the two subspecies.

There are no entirely similar species in the present group. The ups of *M. arion* (Large Blue), *M. telejus* (Scarce Large Blue) and *M. nausithous* (Dusky Large Blue) are very different in having postdiscal spots. The uns of *M. arion* is much more boldly marked, too, than *M. alcon*. The uns of *M. telejus* is similar to *M. alcon*, but the row of unfw postdiscal spots is less

curved on the former (see p. 22).

Outside the present group, there is some similarity to *Iolana iolas* (Iolas Blue), ch. 5.13, which is also very large, but has a very pale uns, a brilliant, gleaming-blue ups in the male and a distinctive, nearly-straight row of unfw postdiscal spots. Also, it is closely associated with *Colutea* (Senna) bushes. These differences are enough to make correct identification easy in the field.

The only other similar large species outside the present group is *Meleageria daphnis* (Meleager's Blue), ch. 5.4, whose males also have a pale-brown uns ground-colour, but the sub-marginal marks are quite different and there is a cusp in the wing-margin at the end of vein p3 like an incipient tail. The female of *M. daphnis* is very different.

**Photography**

It is very important to check out which foodplant is present if one is interested in identifying the supposed subspecies or, even better, to observe ovipositing taking place; the *Gentiana* spp are large enough to be found easily. The foodplant used might often be useful, too, in distinguishing females of *M. alcon* and *M. telejus* (Scarce Large Blue), if pictures of only the uns can be taken. As mentioned, details of the differences are described in the section on *M. telejus*, p. 22.

The most reliable way a photographer can identify the subspecies is to find out from experts which one actually flies at a given site. It is then informative to check if the information agrees with the taxon suggested by the eco-subspecies approach.

The butterfly is easy to see and has no difficult habits. As with other Large Blue spp, if it will not open its wings when at rest, try again early the next day.



Alcon Blue

Large Blue Group

Maculinea alcon

22 July 1995; Soria, Spain (all pictures on this page)

ssp *alcon*

These pictures were taken at a well known site for *ssp alcon* in Provincia de Soria, Spain. The site consists of a small, damp patch (less than 50 m square) on a sloping, dry pasture-field. From a distance, the patch showed bright green against the straw coloured grass of the rest. At the lower boundary of the field is an inaccessible wet area with long vegetation where possibly the main population was breeding. Nevertheless, ovipositing was observed in the damp patch on *Gentiana pneumonanthe* (Marsh Gentian), the foodplant of *ssp alcon*.

Males at this site (above, left and right) have a pale-to-medium blue ups ground-colour and quite-wide, black wing-borders.

Females (left and right) have a dusky-blue colour on the basal region of the upfw, reaching as far as the disco-cellular mark. Beyond this point the wings are effectively all black and any postdiscal spots or submarginal marks are just about entirely obscured. The upfw disco-cellular mark lies just in the blue region of the wing on this insect.



The unss of both sexes are very similar: the ground-colour is pale grey-brown; the postdiscal spots are well formed on both wings, but the antediscal spots on the unhw are irregular in size; there is a small unfw cell-spot; and the submarginal band has definite, but not prominent, inner dark marks, absent or faint outer dark marks and no orange marks; and there is a faint basal blue flush of limited extent.

As may be seen, there is always one unhw antediscal spot, but the other smaller spots may be wholly or partly absent.

The dark uns spots etc. are larger than those on *ssp rebeli* (next page).

The above ups and uns features agree with the standard description, except for the presence of the faint basal blue flush that should be absent.

Comparing *M. alcon* with *M. arion*, the latter is larger and has much bolder submarginal dark marks and, usually, a more extensive unhw basal blue flush.



The female (right) is ovipositing on *Gentiana pneumonanthe* (Marsh Gentian) before the plant is in flower.

The flower of *G. pneumonanthe* (left, also printing at 2 times life-size on A4), has three visible ova of *ssp alcon*. It was photographed at a later date in a different year (06 August 1994) when no adults were seen because, presumably, the flight-period had finished.

Comparing *G. pneumonanthe*, shown here, with *G. cruciata* (Cross Gentian), shown later, p. 15, it may be seen that the leaves of the former are narrower and the plant is altogether less robust.

When the picture shown later of *ssp rebeli* on *G. cruciata* was taken, that plant was not in flower.



Maculinea alcon

Large Blue Group

Alcon Blue



04 July 1991; subalpine meadow at 1400 m in the central Pyrenees, Spain (all pictures on this page)

ssp *rebeli*

The site is an authentic *ssp rebeli* site, with a population of literally many thousands.

The male ups ground-colour is slightly deeper and richer than that of *ssp alcon* at the Soria site, and the ups dark wing-borders are of similar breadth. This disagrees with the standard description that *ssp rebeli* is "brighter blue with borders narrower and better-defined".

The male uns ground-colour (right) is grey-brown with smaller spots than *ssp alcon*, which

agrees with the standard description. The unhw basal blue flush is perhaps more extensive than on *ssp alcon*, which also agrees with the standard description.

The female uns (left) is very similar to the male, and as with the male has smaller spots than *ssp alcon* from Soria, agreeing with the standard description. There is a very slight basal blue flush, agreeing with the standard description.



The ups dark suffusion slightly obscures the postdiscal spots on the female (right), but almost entirely obscures them in the other female (below left). The latter disagrees with the standard description.

The picture (below right) illustrates the large size of *M. alcon* compared to most other Polyommatinae species. Here it is alongside *Plebejus argus* (Silver-studded Blue), ch. 5.10.

The uns (above) and the others that follow of *ssp alcon* and *ssp rebeli* show the sharply curved row of postdiscal spots, that distinguishes *M. alcon* from *M. telejus* (Scarce Large Blue). In particular, spot pd4 on the unhw and on the unfw, where visible, conform to the test given on p. 22.



Alcon Blue

Large Blue Group

Maculinea alcon

04 July 1991; same site as previous page, Pyrenees, Spain (above and right)

ssp rebeli

Ssp rebeli flies on the subalpine meadows in the foreground and the near middle distance, where the meadow vegetation is long. Even so, the ants must thrive because the butterfly population was very large.

The female (right) is perched on the foodplant, *G. cruciata* (Cross Gentian), where three ova are visible.



12 June 1997; a lowland meadow in Côte d'Or (see next page), east-central France (left and right)

ssp rebeli

The insects from this site are identified as *ssp rebeli* because the foodplant being used seems to be *G. cruciata* (Cross Gentian).

The uns of this female has a rather-brown ground-colour and almost no basal blue flush, which, if anything, fits the standard description of *ssp alcon*.

The quite-blue ups and visible upfw postdiscal spots are, however, characteristic of *ssp rebeli*.



Maculineaalcon

Large Blue Group

Alcon Blue



12 June 1997; same site as bottom of previous page, Côte d'Or, east-central France (left and right; above)

ssp rebeli

The dark ups of this female, which more-or-less obscures the postdiscal spots, is characteristic of *sspalcon* in the standard description, and so are the bold uns spots etc., and the rather brown ground-colour.

Since the ups of the first female from this site (at the bottom of the previous page) agrees with the standard description of *ssp rebeli*, and this one agrees with *sspalcon*,

it seems one cannot rely on the female ups to distinguish the subspecies.

The variability of the female ups shown from this site is quite usual elsewhere, too, in my experience.

The preceding pictures were taken at the site pictured above: a sloping, flower-rich pasture with places where concentrations of the foodplant, *G. cruciata* (Cross Gentian), grew.



11 July 1996; roadside bank in the hilly country between Nürnberg and Regensburg, S Germany (right)

ssp rebeli

The site is illustrated on the next page.

The foodplant being used was *Gentiana cruciata*, as shown in the picture of this female.

The row of ups postdiscal spots and the disco-cellular mark are obscured, however, which favours *sspalcon* according to the standard description.



Alcon Blue

Large Blue Group

Maculinea alcon

30 June 1997; a roadside bank in the hilly country between Nürnberg and Regensburg, S Germany (above)

The site itself is a dry, calcareous slope, rich in flowers, but immediately across the road is the floodplain of a small river, with damp fields and marshy places. However, the females were observed to be ovipositing on *Gentiana cruciata* (Cross Gentian), the usual foodplant of *ssp rebeli*. The electricity pylon is built on a level, man-made terrace where a small amount of the foodplant was growing, but not elsewhere so far as I could see.



11 July 1996 (left and right) and 04 July 1994 (below right); as above, S Germany
ssp rebeli

The pictures (left and right) are of the same male. It has a clear-blue ups, with fairly-narrow dark wing-borders, and the hw fringe is partially laddered, all of which favour *ssp rebeli*, according to the standard description, but the small upfw disco-cellular mark is not usual on either subspecies of *M. alcon*.



The uns ground-colour of this male is quite brown, but on the other male (right) the ground-colour is pale-grey. It is hard to believe the colour difference is not mainly genuine, so these pictures warn against relying on the uns ground-colour to distinguish the subspecies.



05 July 2000; a dry, open, grassy area with flowers, SW Hungary (left; three pictures at the top of the next page)
ssp alcon?

Although the pictures were taken in a dry and flowery area, there was an extensive marshy area close-by where *Gentiana pneumonanthe* (Marsh Gentian) was growing. It is assumed, therefore, that the insects found were *ssp alcon*. *M. telejus* (Scarce Large Blue) was also found here, see p. 24.

Only males were photographed in the drier area, perhaps because of the flowers, and presumably the females were in the marshy area where most of the foodplant grew.
cont. on next page



Maculinea alcon

Large Blue Group

Alcon Blue



cont. from previous page

The male ups (bottom of previous page) is similar to *ssp alcon* and *ssp rebeli* elsewhere, for there seems to be little real difference between the male upps. The uns of the same male (left) might easily have been thought to be female from the position of the abdomen if it were not for the ups picture and the foreleg, which is shown in another picture but not printed here.

The female (right) has slightly bolder spots, a slightly darker uns ground-colour and a stouter abdomen than the male. The position of the abdomen is typically female.



Despite the small size of the insect (left) the sharp curvature of the unfw postdiscal row tends to rule out *M. telejus*, an example of which from this site on this date is shown later, p. 24. The markings are close to those of the male above, and one must suppose it to be a semi-dwarf insect.



12 July 1999 (right) and 28 June 2008 (left; below, left and right); a warm, south-facing, flowery slope at 550 m with fairly-long vegetation near woodland, Bakony Hills, Hungary
ssp rebeli (xerophila)



This is an authenticated site for the taxon *xerophila*. The foodplant being used was *G. cruciata* (Cross Gentian), so this taxon may be regarded as a race of *ssp rebeli*. This race is known for being generally dark.

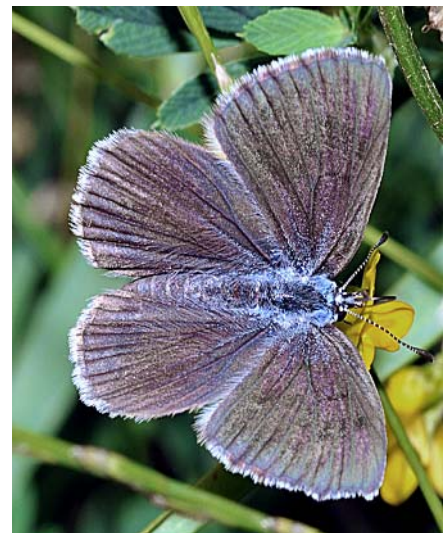
The July date was at the end of the flight-period, for all the insects then were worn.

The male ups (above right) has extensive vein-darkening, perhaps in part due to wear. The uns colour is unreliable because, unfortunately, the picture has been recovered from a very underexposed original transparency. The picture of the male (above left) is reliable and has a grey uns ground-colour.

The female ups (right) is almost entirely dark but the illustration in Bálint (1996) has more blue, similar to the standard description of *ssp rebeli*.

The vestigial ups blue scaling on this female is, however, typical of several others seen.

The female (left) has a very brown uns ground-colour, quite different from the male and very different from the standard description of *ssp rebeli*. The ground-colour is the same on all females photographed.



Alcon Blue

photo: Ted Benton, mag. approx.

Large Blue Group

19 July 1999; marshy meadow, about 50 km S of Budapest, Hungary (left and right) **ssp alcon**

The foodplant of *ssp alcon* was growing in the wetter areas of this site.

The male uns (right) is similar to those shown on the previous page, but the printed colour is unreliable because the original was very underexposed. In contrast, the male uns (left) is less boldly marked and has a browner ground-colour than the males on the previous page. (The original of this picture is better than the version printed here due to my unsatisfactory copying process.)

**Maculinea alcon**

23 July 1996; grassland at about 400 m in the Bükk Mountains, N Hungary (right) **ssp rebeli**

This male is assumed to be *ssp rebeli* because of the dry habitat and because it fits the distribution maps given by Bálint (1996) for taxon *xerophila*.

The bright-blue ups and sharply-defined borders fit the standard description of *ssp rebeli* and the grey uns ground-colour is appropriate too.

The dark unhw spots etc. seem to be faint or absent, so there might be some difficulty in distinguishing this insect from *Iolana iolas* (Iolas Blue), ch. 5.13, unless one notices that the row of unfw postdiscal spots curves away from the wing-margin as one traces the curve from the costa towards the inner wing-margin; on *I. iolas* the opposite occurs.



03 July 2008; a meadow in woodland at 450 m in the eastern Carpathians, NW Romania (left; below, left and right) **ssp rebeli**

ssp rebeli

This female was seen ovipositing on the *Gentiana cruciata* (Cross Gentian) plant (below, printing at life-size on A4). A few ova are just visible.

The ups is extremely dark with no blue suffusion as such, just a scattering of blue scales. The white mark on the upfw is not a proper pattern-element. The total obscurity of the postdiscal spots etc., fits better with the standard description of *ssp alcon*.

The uns ground-colour is quite brown, as seen on a number of insects shown before.



Maculineaalcon

Large Blue Group

Alcon Blue



03 July 2008; same site as bottom of previous page, NW Romania (left and right; below, left and right)

ssp rebeli

One male (left and right) is more worn than the other (below, left and right). However, allowing for this they are similar.

The uns ground-colour is quite brown, like that of the female from this site already shown.

There are some small differences in the sizes of the uns postdiscal spots and in the visibility of the submarginal marks.

Although these differences are not large they are as great as many illustrations show for the difference between *sspalcon* and *ssp rebeli*.

Taking into account all the pictures shown, there seems to be little consistent difference between the two subspecies across Europe and such differences as there are do not correlate well with the standard description, except, perhaps, in western Europe. Quite possibly the standard description originates from descriptions of western races.



14 July 2008; verdant gully at 1800 m in the southern Pirin Massif, SW Bulgaria (right)

ssp rebeli?

Because of the altitude this insect is presumed to be *ssp rebeli*, but the foodplant was not observed. And although very flowery, the habitat was generally quite dry.

This male is very similar to the insect above from Romania, and tends to confirm a general tendency for browner uns ground-colours in eastern Europe.

Another generally similar *M.alcon* was photographed, but more worn and with larger uns spots etc. The sex could not be identified, but one might presume it to be female from the larger spot size.

