

MERRYWEATHER Natural History



**A KEY FOR THE IDENTIFICATION OF TEN
ORCHIDS COMMON IN WESTERN SCOTLAND**

James Merryweather

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Dactylorhiza fuchsii

Pollinia
(pollen sacs)
in their sheaths

Labellum

Hood

Wing

Spur

Labellum:
Side (lateral) lobes
Central lobe



Dactylorhiza fuchsii

Stigmas
(above bees'
access to spur
and nectar)

START HERE Compare descriptions 1a/1b etc. Choose the option that fits your unknown orchid. Then follow instructions on the right. Refer to colour pictures for guidance and confirmation only.

1a In flower at bluebell time (May-June). Flower purple (occasionally pink or white) with discrete spots (not patterns as above) on labellum. Leaves usually blotched dark purple.

Early purple orchid *Orchis mascula* (Fig. 1)

1b In flower after the bluebells (June-July). Flowers and leaves not entirely as 1a. Go to 2

2a Leaves 2, broad, more-or-less oval. Flowers green, red or reddish-green. Go to 3

2b Leaves more than 2, narrow, straplike. Flowers shades of red, purple, pink, white. Go to 4

3a Plant 20-60 cm. Conspicuous, woodland and wayside. Spike tall with numerous green flowers.

Twayblade *Neottia ovata* (Fig. 3)

3b Plant 2-20 cm. Inconspicuous, among heather. Spike short with a few reddish-green flowers.

Lesser twayblade *Neottia cordata* (Fig. 4)

4a Flowers small (< 1 cm), pink-purple, not patterned, numerous, crowded, fragrant. Leaves unspotted.

Fragrant orchid *Gymnadenia conopsea* (Fig. 2)

4b Flowers large (> 1 cm). If purple, patterned. If fragrant, not purple. Leaves spotted or not.

Go to 5

5a Flowers cream with greenish tinge. Labellum long and narrow, not lobed.

Go to 6

5b Flowers shades of red, purple, pink and white. Labellum broad, lobed.

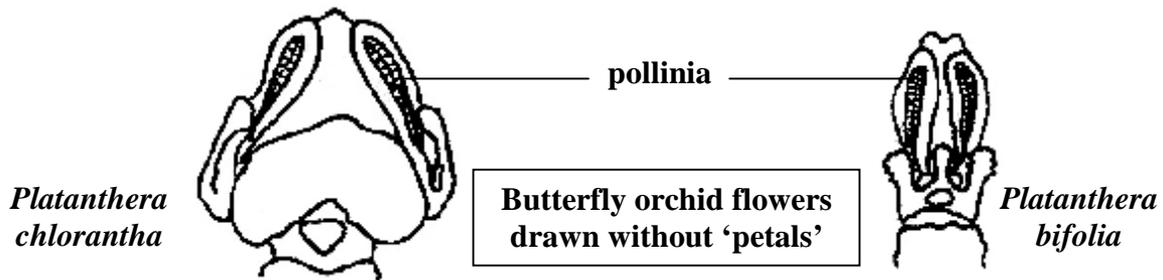
Go to 7

6a Pollinia set apart, diverging downward (see diag. below). Flower not particularly fragrant or fragrant at night. Waysides and species-rich meadows.

Greater butterfly orchid *Platanthera chlorantha* (Fig. 5)

6b Pollinia close together, parallel (see diag. below). Flower very fragrant. Moorland.

Lesser butterfly orchid *Platanthera bifolia* (Fig. 6)



- 7a Plant slender (of 'normal' stature), height ~30 cm. Go to 8
 7b Plant massively built, height 40-80 cm (*due to hybrid vigour*). Go to 11

- 8a Leaves not spotted. Go to 9
 8b Leaves spotted (check several specimens because occasionally spots are few or none). Go to 10

- 9b Flowers pink or pale purple (occasionally bick-red). Folded back labellum has almost no central lobe (comp. *D. fuchsii* & *D. maculata*). Damp moorland.

Early marsh orchid *Dactylorhiza incarnata* (Fig. 7)

- 9a Flowers unvarying rich purple. Labellum flat and roughly diamond-shaped, not distinctly three-lobed. Damp moorland. Often mistakenly called 'early purple orchid' because it's so purple.

Northern marsh orchid *Dactylorhiza purpurella* (Fig. 8)

- 10 Examine the labellum, the lowest, three-lobed 'petal' of several flowers, noting the length, breadth and area of the central lobe in relation to the side lobes (compare Fig. 9 & 10).



Dactylorhiza fuchsii

RANGE OF FORM IN LABELLUM

Dactylorhiza maculata

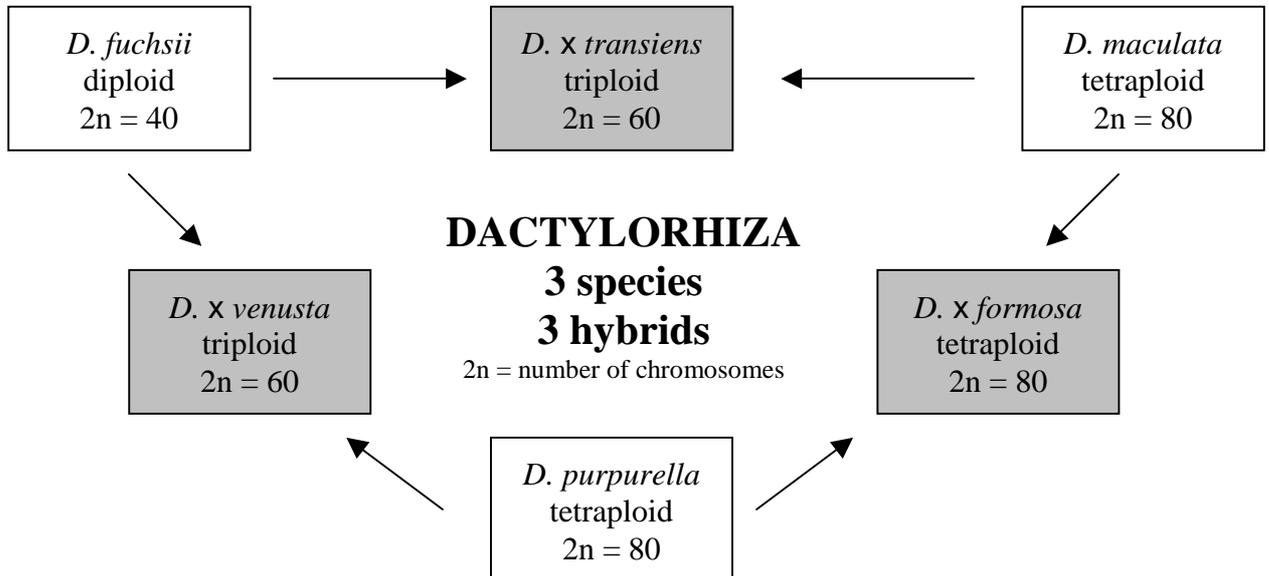
- 10a Labellum: 1. central lobe almost same area as side lobes; 2. as long as or longer than side lobes. Wayside and marshy grassland. **Common spotted orchid *Dactylorhiza fuchsii*** (Fig. 9)
 10b Labellum: 1. central lobe much smaller than side lobes; 2. usually shorter than side lobes. Damp moorland. **Heath spotted orchid *Dactylorhiza maculata*** (Fig. 10)

- 11 Massive orchids which exceed the majority in height, bulk and number flowers. Probably hybrids of *Dactylorhiza fuchsii*, *D. maculata* and *D. purprella* or backcrosses of such hybrids with any one of the three parental species. ***Dactylorhiza* hybrids**

FEEDBACK Identification guides (the ones that work) benefit from constant revision. If you think there are errors in the key or have suggestions for improvement, particularly if you've tried it and come unstuck, please contact James Merryweather: james@UKferns.org.uk.

HYBRID ORCHIDS

Three of our common orchids, *Dactylorhiza fuchsii*, *D. maculata* and *D. purpurella*, frequently cross pollinate and form hybrids. Unfortunately the situation is not simple because F₁ hybrids will backcross with any of the parental species in the vicinity and backcrosses may backcross again and again creating confusing swarms of these several stages of hybridization - mixed.



It is not impossible to ascertain a likely parental history for outsized individuals in the field, though technical confirmation is essential for complete confidence of their identity. Combinations of parental characteristics will provide indications of relationship, assuming that the parents are already well known. A 50:50 ratio of two parental species' characters can be deemed to indicate (within the limitations of the method) F₁ hybrids. However, a good number of plants fail to give a neat 50:50, in fact an alarming variety of possibilities may be obtained, indicating the presence of all three species' genomes in single individuals, the result of backcrossing, once and maybe more times.

After field courses at which students scored many orchids for their parental and hybrid characteristics, I attempted to put their data into a form from which I might create family trees for these difficult plants. It showed they found a mosaic of interbred orchids, especially at the sites where all three species and the three F₁ hybrids occurred together. Unfortunately, in the end I was obliged to conclude that the field scoring method (as expected) has its limitations, for findings contradicted the very reasonable statement by R.H. Roberts (in Stace, C.A. (1975). *Hybridization and the flora of the British Isles*. Academic Press, London.) that the F₁ hybrid *D. x transiens* (*D. fuchsii* x *D. maculata*), a triploid (i.e. with one pairing set of chromosomes and one set unmatched), should be sterile. Either Roberts was mistaken, and enough *D. x transiens* back-cross chromosomes are able to pair during gamete production to produce some viable seed, or – very likely – the field method is unsatisfactory. Even so, don't be put off trying to work out (guess) the parentage of outsized, probably hybrid orchids.

POLLINATION: You can discover how orchid pollination happens by becoming a bee mimic. Bees collect nectar from an orchid flower by pushing their proboscis deep into the spur. As they do so, their head presses on the bases of the pollinia, two pollen sacs located under the hood, each of which has a sticky pad at the bottom of a short stalk (arrow, right). One or both pollinia stick to the bee's head, sticking up like little club-shaped horns and the bee, when satisfied, flies to another flower. By the time it has arrived, the pollinia



stalks have bent forward and, as the bee pushes its proboscis down the spur of this next flower, the pollinium heads are pressed against a pair of stigmas, set either side of the spur entrance, depositing pollen.

Take a long, thin pointed object (a rush stem is ideal and will be close to hand, for several species of *Juncus* usually share a habitat with several common orchids) and mimic a bee gathering nectar. Choose a newly opened flower because it is less likely than an old one to have already given up its pollinia. Gently but firmly push your probe down the spur of an orchid flower. Imitate the bee's enthusiasm by pressing so that the probe arches gently upwards in the direction of the pollinia bases so that the likelihood of the sticky pads catching is improved. The pollinia will almost 'leap' from their sheaths onto your fake proboscis. Withdraw the probe and hold it up in front of your eyes so that you can observe pollinium behavior for a minute or so, close to. They will slowly – at the speed of a clock's minute hand, so almost visibly – bend forward, taking up position to dab pollen on the stigmas of the next flower they 'expect' you to visit.

ILLUSTRATIONS:

WARNING Please avoid casual picture matching, a tempting but haphazard procedure that often leads to misidentification. Systematic progress through the key from 1a/1b is more likely to result in a correct result, whilst the illustrations serve as aids to comparison and, finally, confirmation of your orchid's identity.

Fig. 1 Early purple orchid *Orchis mascula*



O. mascula pale variant showing spots

Fig. 2 Fragrant orchid *Gymnadenia conopsea*



Fig. 3 Twayblade *Neottia ovata*

Two broad, ovate leaves; > 30 cm tall



Fig. 4 Lesser twayblade *Neottia cordata*

Two broad, ovate leaves; < 10 cm tall



Fig. 5 Greater butterfly orchid *Platanthera chlorantha*



Fig. 6 Lesser butterfly orchid *Platanthera bifolia*



Black lines show position and alignment of pollinia: Apart-Divergent (*P. chlorantha*); Close-Parallel (*P. bifolia*)

Fig. 7 Early marsh orchid *Dactylorhiza incarnata*



Labellum folded back;
central lobe small

Fig. 8 Northern marsh orchid *Dactylorhiza purpurella*



Labellum ~ diamond-shaped;
central lobe small

Fig. 9 Common spotted orchid *Dactylorhiza fuchsii*



Labellum: central lobe broad,
longer than side lobes

Fig. 10 Heath spotted orchid *Dactylorhiza maculata*



Labellum: central lobe small,
not longer than side lobes