

## Two new varieties of British *Dactylorhiza*

D. M. T. ETTLINGER

Royden Cottage, Cliftonville, Dorking, Surrey, RH4 2JF

### ABSTRACT

*Dactylorhiza fuchsii* var. **rhodochila** D. M. T. Ettliger, var. nov., and *D. majalis* subsp. *purpurella* var. **atrata** A. J. Richards, var. nov., are distinguished from typical specimens chiefly by their blotch-marked labella.

### INTRODUCTION

The labellum of many species of European Orchidaceae has small purple dot or dash markings on a paler background, these being very occasionally replaced by a solid central or overall reddish-purple blotch. In most species this variation is rare and occurs only in isolated individuals, e.g. in *Corallorhiza trifida* Chatel., *Orchis anatolica* Boiss., *O. morio* L. and *O. coriophora* L. In the genus *Dactylorhiza* it seems to be more frequent, the best-known example being *D. insularis* (Sommier) Landwehr var. *bartonii* Huxley & Hunt.

This blotch marking on the labellum may be accompanied by heavier-than-average leaf spotting (e.g. in *D. fuchsii*), heavy leaf spotting where little or none is usually present (e.g. in *D. majalis* subsp. *purpurella*), and sometimes even overall suffusion of the leaves with anthocyanins (both). However, no change in leaf marking is seen in *D. insularis* var. *bartonii* or in the blotch-marked variants in *Orchis*, so blotch marking of the labellum cannot be simply an effect of heavy anthocyanin presence in the plant as a whole: some mutation in the genes that code for labellum marking seems likely to be the cause.

That this sort of variation may have evolutionary potential is indicated by the pollination advantage gained by having two colour morphs in *D. sambucina* (L.) Soó (Nilsson 1980). This species offers no reward to its bumblebee pollinators (*Bombus* spp.) and attracts them by deceit; the presence of the red var. *rubra* Winterl., in addition to the commoner yellow morph, presents an additional search pattern and extends the period before individual pollinators learn to avoid the species as a whole. For *D. fuchsii* a similar picture of deceit is clouded by the finding (Dafni & Woodell 1986) that unrewarded visits by naïve bumblebees were supplemented by visits from honeybees (*Apis mellifera*), which were to some extent rewarded by a stigmatic exudate. Nevertheless, I believe that Dafni & Woodell's study area (with which I am familiar) carried an atypically high honeybee population and there must be many *D. fuchsii* sites, e.g. in dune systems and on open downland, where honeybee presence is negligible. No similar work has been published on the pollination ecology of *D. majalis* subsp. *purpurella* but it is a reasonable assumption, in view of the high incidence of hybrids between the two where they coexist, that it is similar to that of *D. fuchsii*.

It therefore seems worthwhile to distinguish by name those examples of the blotch variation which at least occur regularly. Populations with these variants also contain typical specimens and intermediates do occur. No form of isolation seems to be involved and the rank of variety therefore seems to me to be appropriate.

Bateman & Denholm (1989) referred to three, possibly four, British dactylorchids in which a blotched variant occurs: *Dactylorhiza maculata* (L.) Soó subsp. *ericetorum* (E. F. Linton) Hunt & Summerhayes, *D. fuchsii* (Druce) Soó, *D. majalis* (Reichenb.) Hunt & Summerhayes subsp. *purpurella* (T. & T. A. Steph.) D. M. Moore & Soó, and possibly a single specimen of *D. incarnata* (L.) Soó. They mentioned without comment the already-named blotch-marked *D. maculata* var. *concolor* Vermeulen and they refrained from giving names to the others.

The analogous variety in *D. fuchsii* appears to be commoner in the British Isles than *D. maculata*

var. *concolor*, and Bateman & Denholm (1989) listed six British sites, including one of their own study areas where it formed c. 20% of the *D. fuchsii* population. To these should now be added a drain bank near Belton, N. Lincs. (Weston 1979), alkaline grassland at Blackhall Rocks, Co. Durham (M. Bradshaw 1967 per M. R. Lowe, pers. comm. 1985), a second limestone meadow in Derbys. (P. M. Torry, pers. comm. 1989), a wood on Wealden Clay near Warnham, W. Sussex (D. C. Lang, pers. comm. 1990) and the edge of a chalk beechwood near Duncton, W. Sussex (J. M. Scott per D. C. Lang, pers. comm. 1990). There can be little doubt that more sites will come to light once the taxon is formally recognised.

The blotch-marked variety of *D. majalis* subsp. *purpurella* is only known at present from one site near Hartlepool (Bateman & Denholm 1989), where a population of over 100 specimens was found in 1978 by A. J. Richards and has persisted since: plants approaching its description have been seen near Kilmore, Co. Wexford, and near Hornhead, W. Donegal, though these need confirmation (R. Piper, pers. comm. 1989).

Richards proposed the epithet *atrata* for this taxon but did not actually publish it. However, it has already become widely known on a hearsay basis and has appeared in print as a nom. illegit. (Graham 1988). To rectify this situation, A. J. Richards has kindly supplied the diagnosis of var. *atrata* below.

In both these varieties the chief distinction lies in labellum colour. Since colour cannot at present be preserved in herbaria, the obligatory holotype specimens have been supplemented by additional material in the form of photographic prints on Cibachrome made from colour transparencies; these should have a useful life in herbarium conditions of 50–100 years.

#### THE VARIETIES

*Dactylorhiza fuchsii* (Druce) Soó var. **rhodochila** D. M. T. Ettliger, var. nov.

HOLOTYPE: Beacon Hill, GR 41/608.226, N. Hants, v.c. 12, chalk grassland, 11 June 1990, *D. M. T. Ettliger* (K). Additional photographic material from the same site and from near Buxton, GR 43/09.75, Derbys, v.c. 57, limestone grassland (photographs by D. M. T. Ettliger, June 1989 and June 1984 respectively) is with the holotype in K, copies in BM.

*A. D. fuchsii* differt sequentibus: folia subdensiore punctata, labellum signatum macula rhodopurpurea ad centrum cum margine pallidiore, vice punctibus linulibusque. Speciminibus extremibus paginae superiores foliarum omnino a purpureo tectae, et totum labellum atropurpureum sine margine pallida.

It differs from typical *D. fuchsii* as follows: leaves rather more heavily spotted, the labellum marked with a broad central reddish-purple area with paler edges in place of dots and small lines. In extreme examples the leaves are suffused on the upper surfaces with purple and the whole labellum is a rich dark purple without a pale margin.

*Dactylorhiza majalis* (Reichenb.) P. F. Hunt & Summerhayes subsp. *purpurella* (T. & T.A. Steph.)

D. Moresby Moore & Soó var. **atrata** A. J. Richards, var. nov.

HOLOTYPE: Locality (details withheld) in Co. Durham, v.c. 66, dune grassland, 13 July 1979, *A. J. Richards* (BM). Additional photographic material from the same site (photographs by D. M. T. Ettliger, leg. A. J. Richards, 11 July 1985) is with the holotype in BM, copies in K.

*A. D. majalis* subsp. *purpurella* differt sequentibus: folia grosse atromaculata, in pagina superiore maculis rotundis solidis ultra 5 mm in diametro, in pagina inferiore regulariter punctata ad margine, punctae circa 1 mm in diametro. Labellum saepe toto suffusum atropurpureum sine maculis vel linebus, aliquando cum margine pallidiore.

It differs from typical subsp. *purpurella* as follows: leaves heavily and darkly spotted, on the upper surface with solid round spots of over 5 mm diameter, on the lower surface regularly marked at the

edges with spots of c. 1 mm diameter. Labellum usually entirely suffused with dark purple without spots or lines, sometimes with a paler edge.

## ACKNOWLEDGMENTS

I am grateful to I. Denholm, P. F. Hunt, M. R. Lowe and F. Rose for advice and comments on parts or all of the manuscript; to the Nature Conservancy Council for permission to take the holotype of var. *rhodochila* from a National Nature Reserve; and particularly to A. J. Richards for advice and permission to include his var. *atrata* in this paper.

## REFERENCES

- BATEMAN, R. M. & DENHOLM, I. (1989). A reappraisal of the British and Irish dactylorchids, 3. The Spotted-orchids. *Watsonia* 17: 319-349.
- DAFNI, A. & WOODDELL, S. R. J. (1986). Stigmatic exudate and the pollination of *Dactylorhiza fuchsii*. *Flora (Jena)* 178: 343-350.
- GRAHAM, G. G. (1988). *The flora and vegetation of County Durham*. Durham.
- NILSSON, L. A. (1980). The pollination ecology of *Dactylorhiza sambucina*. *Bot. Notiser* 133: 367-385.
- WESTON, I. (1979). A variant of *Dactylorhiza fuchsii* (Druce) So6 in N. Lincs. *Watsonia* 12: 399-400.

(Accepted August 1990)