

## A new dactylorchid hybrid

F. HORSMAN

7 Fox Wood Walk, Leeds, LS8 3BP

### ABSTRACT

An account is given of a new hybrid from Cardiganshire (v.c. 46), *Dactylorhiza* × *dinglensis* (Wilmott) Soó nothosubsp. *robertsii* F. Horsman, **nothosubsp. nov.** (*D. majalis* (Reichenb.) P. F. Hunt & Summerhayes subsp. *ambrensis* (R. H. Roberts) R. H. Roberts × *D. maculata* (L.) Soó subsp. *ericetorum* (E. F. Linton) P. F. Hunt & Summerhayes).

### INTRODUCTION

In 1987 I visited a locality near Borth (Cards., v.c. 46) which was one of the two sites from which Roberts (1961b) described *Dactylorhiza majalis* (Reichenb.) P. F. Hunt & Summerhayes subsp. *ambrensis* (R. H. Roberts) R. H. Roberts and which has the largest known population of that taxon. In 1988 I counted nearly 1500 flowering spikes. This suggests the population has maintained its size since Roberts first saw it 30 years ago (Roberts, pers. comm.). Ellis (1983) records *D. majalis* subsp. *ambrensis* from only four 10-km squares in Wales.

In common with Roberts (1961a), the only other dactylorchid I found in the Borth locality in 1987 and 1988 was *D. maculata* (L.) Soó subsp. *ericetorum* (E. F. Linton) P. F. Hunt & Summerhayes. In 1987 I observed plants intermediate in morphology between *D. majalis* subsp. *ambrensis* and *D. maculata* subsp. *ericetorum* which were presumably hybrids, a conclusion confirmed by Roberts. A further visit was made to the site in 1988 to study the hybrid and its putative parents.

The hybrid was noticed on my first brief visit because its spur seemed to be intermediate between the two other taxa present, but only a few such plants were seen. In 1988, however, I found the hybrid to be common. The pale lilac colour of the flower, together with the shape of the lip and its markings, were sufficiently distinctive to enable a reliable estimate of the number of hybrids to be made.

The Borth locality consists of wet meadowland and grassland on old stabilised sand dunes, both of which have a rich flora. The dactylorchids are confined to the wet meadowland. The hybrid is common on the two sides of the site which adjoin an old river bed containing a brackish-water marsh. *D. maculata* subsp. *ericetorum* is most common on one of these two sides where a wide range of intermediates between it and *D. majalis* subsp. *ambrensis* is concentrated.

It is intriguing to note that Stephenson & Stephenson (1921), in describing *Orchis latifolia* from this site, could well have been referring to this hybrid when they stated: "Here are many dark forms along with some lighter ones which may be hybrids, where *O. ericetorum* is present, but no trace of *O. praetermissa*".

The hybrid is confined to the Borth site, exact details of which are withheld for conservation reasons. No other sites are known where *D. maculata* subsp. *ericetorum* and *D. majalis* subsp. *ambrensis* grow in close proximity.

Evidence of the presence of a third dactylorchid was found at the site in 1988. A solitary flowering spike of what Roberts suspects, from my colour photographs, may have been an F<sub>2</sub> hybrid or backcross derived from *D. fuchsii* and *D. majalis* subsp. *ambrensis* was found. It was growing on the border of the wet meadowland and the grassland of the old sand dunes. As *D. fuchsii* grows fairly close by, such a find was not surprising.

### TAXONOMY AND NOMENCLATURE

Bateman & Denholm (1983) made *D. praetermissa*, *D. traunsteineri* and *D. purpurella* subspecies of *D. majalis*. Heslop-Harrison (1954) treated them as species, a view with which I concur. In the

British Isles *D. majalis* has three subspecies, subsp. *occidentalis* (Pugsley) P. D. Sell, subsp. *cambrensis* (R. H. Roberts) R. H. Roberts and subsp. *scotica* Nelson. *D. majalis* subsp. *majalis* is confined to Continental Europe, where it is also represented by subsp. *alpestris* (Pugsley) Senghas.

Bateman & Denholm (1983) reduced *D. majalis* subsp. *cambrensis* to *D. majalis* subsp. *occidentalis* var. *cambrensis* (R. H. Roberts) Bateman & Denholm. The reduction of *D. majalis* subsp. *cambrensis* to varietal status is rejected for the following reasons. Bateman & Denholm (1983) state that Roberts (1961b) separated *D. majalis* subsp. *cambrensis* from *D. majalis* subsp. *occidentalis* primarily by the broader leaves and narrower spurs of the plants in the population of *D. majalis* subsp. *occidentalis* measured by Heslop-Harrison (1953), in Co. Clare, v.c. H9, Ireland. *D. majalis* subsp. *cambrensis* is not accepted as a subspecies by Bateman & Denholm (1983) because "Unfortunately, this population was atypical of var. *occidentalis* in these characters".

Heslop-Harrison (1953) measured the maximum width of the *longest* leaf, and the width of the spur *at about a millimetre from the mouth* when flattened. He emphasises that the 'width' figure represents, therefore, not the diameter, but approximately half the circumference at this point. Bateman & Denholm (1983) measured the maximum width of the *widest* sheathing leaf (it must be pointed out that the widest leaf is not necessarily the longest), and the width of the spur *at the entrance* when flattened.

Heslop-Harrison's and Bateman's & Denholm's data are not, therefore, compatible in these two respects. However, Roberts' (1961a, 1961b) data are compatible with those of Heslop-Harrison (1953).

Hybrids involving *Dactylorhiza majalis* subsp. *cambrensis* have previously only been reported from Anglesey (v.c. 52) (Ellis 1983). The other putative parents were *D. purpurella* (T. & T. A. Stephenson) Soó and *D. fuchsii* (Druce) Soó subsp. *fuchsii*. This paper reports the occurrence of a third hybrid with *D. majalis* subsp. *cambrensis* which is previously undescribed.

The name *D. × townsendiana* (Rouy) Soó has previously been used for hybrids between *D. maculata* and *D. majalis* (as defined here). The basionym for this name is *Orchis × braunii* Halácsy var. *townsendianus* Rouy in Rouy & Fouc., *Fl. Franç.* 13: 173 (1912). This in turn is based on *Orchis latifolia-maculata* Townsend, *Fl. Hampshire* 2nd ed., 409 (1904), hence the specific epithet. *D. majalis* does not grow in Hampshire and I believe the plant is *D. maculata × praetermissa*. The name *D. × dinglensis* (Wilmott) Soó is, however, almost certainly referable to *D. majalis* subsp. *occidentalis* × *maculata* subsp. *ericetorum* and that must be called nothosubsp. *dinglensis*. The new hybrid between *D. majalis* subsp. *cambrensis* and *D. maculata* subsp. *ericetorum* I call nothosubsp. *robertsii* after R. H. Roberts, in recognition of his contribution to the study of *Dactylorhiza* and for all the generous help he has given to the Botanical Society of the British Isles as its *Dactylorhiza* referee for nearly 20 years.

*D. majalis* subsp. *occidentalis* is not known to occur in Wales. *D. majalis* subsp. *cambrensis* differs from *D. majalis* subsp. *occidentalis* in having much longer, narrower and more rigid leaves, and much wider spurs (Roberts 1961b). *D. × dinglensis* nothosubsp. *robertsii* differs from *D. × dinglensis* nothosubsp. *dinglensis* in having a wider spur with a throat closer in width to *D. majalis* subsp. *cambrensis*.

#### MEASUREMENTS

In order to quantify the key differences between the hybrid and its parents, one flower from the mid portion of the inflorescence was removed from each of approximately 30 plants of *D. majalis* subsp. *cambrensis*, *D. maculata* subsp. *ericetorum* and their hybrid in 1989 from the Borth locality. The width of the spur throat was obtained by supporting each flower on a plasticine-type material which enabled the flower to be manoeuvred into position for measurement. A high quality steel rule was gently rested on the mouth of the throat and the width at this point measured through a × 10 magnifying glass. The labellum and spur were then excised from the flower as an integral unit and mounted underside uppermost on transparent glue on white card. The spur length and width were measured as soon as possible after mounting. Spur length measured was equal to character 2 in Fig. 1a of Bateman & Denholm (1989). Spur width was measured at the point where character 1 meets character 2 in the same figure.

The results are tabulated in Table 1.

TABLE 1. SPUR DIMENSIONS FOR *DACTYLORHIZA* × *DINGLENSIS* NOTHOSUBSP. *ROBERTSII* AND ITS PARENTS

(N = sample size, S.D. = standard deviation)

	Spur throat width (mm)			Spur length (mm)			Spur width (mm)		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
<i>D. majalis</i> subsp. <i>cambrensis</i>	30	2.51	0.25	30	7.87	0.73	29	2.61	0.25
<i>D.</i> × <i>dinglensis</i> nothosubsp. <i>robertsii</i>	30	2.18	0.15	28	8.30	0.66	27	2.08	0.35
<i>D. maculata</i> subsp. <i>ericetorum</i>	27	1.81	0.16	30	6.52	0.90	30	1.19	0.22

## DESCRIPTION

***Dactylorhiza* × *dinglensis* (Wilmott) Soó nothosubsp. *robertsii* F. Horsman, nothosubsp. nov.**

*Dactylorhiza majalis* (Reichenb.) P. F. Hunt & Summerhayes subsp. *cambrensis* (R. H. Roberts) R. H. Roberts × *D. maculata* (L.) Soó subsp. *ericetorum* (E. F. Linton) P. F. Hunt & Summerhayes.

HOLOTYPE: Near Borth, Cards., v.c. 46, wet meadows, 17 June 1988, F. Horsman V88.58.1 (NMW).

Calcar floris 8.3 mm longum, 2.1 mm latum, crassitudine *D. majalis* subsp. *cambrensi* propinquior, utriusque parentis calcare longior, nonnunquamque perspicue maculatum, eius faux 2.2 mm lata, latitudine *D. majalis* subsp. *cambrensis* propinquior.

Spur of flower 8.3 mm long, 2.1 mm wide, closer in thickness to that of *D. majalis* subsp. *cambrensis* and longer than in either parent, sometimes clearly spotted, its throat 2.2 mm wide, closer to that of *D. majalis* subsp. *cambrensis*.

Roots not examined. Average height c. 30 cm. Stem c. 5 mm in diameter at third lowest expanded leaf node, solid, suffused purplish from between first and second non-sheathing leaves upwards, faint at first but increasing in intensity, ridged from lowest non-sheathing leaf upwards. Basal sheath brown. Expanded sheathing leaves commonly 5, non-sheathing leaves commonly 3, 80% of expanded sheathing leaf nodes commonly in lowest 25% of stem. Expanded leaves – lowest c. 10 × c. 2 cm, becoming longer and narrower up the stem to the fourth (c. 13 × c. 1.25 cm) with the uppermost c. 10 × c. 1 cm; non-sheathing leaves – lowest c. 5.5 × 0.75 cm, becoming shorter and narrower up the stem to uppermost (c. 2.75 × c. 0.5 cm); lower floral bracts exceeding flowers, lowest c. 2.5 × 0.5 cm; all leaves widest between base and middle and becoming progressively more erect up the stem; leaves grey-green, the upper expanded leaves darker; lowest expanded leaf blunt and keeled, higher expanded leaves becoming acute and very shallowly hooded; lowest non-sheathing leaf tapering from c. one-third length from base; spots on upper surfaces of expanded leaves, maximum diameter on lower leaves c. 2.5 mm and on upper c. 1.5 mm, some of those on lower leaves transversely elongated or ± oval, fewer transversely elongated on upper leaves, very high density on middle leaves, distributed towards leaf margins and only c. 10% in upper half of leaf, very few spots on uppermost expanded leaf; upper non-sheathing leaves faintly suffused with purple. Inflorescence c. 20% of total stem length, c. 2 × as long as wide, c. 5 flowers/cm, fragrant, cylindrical. Flowers pale lilac; outer lateral perianth segments spreading to drooping, faintly marked with blotches and lines; median outer perianth segment unmarked. Forward edges of inner lateral perianth segments deeper in colour; labellum shape as in Fig. 1, basic pattern of markings – 2 adjacent loops in central part, elongated and narrowed towards mid-lobe, loops ± continuous through spur throat and within the upper part of each loop is another elongated loop, but pattern of markings in central part of labellum exhibiting great variability; lateral lobes very slightly reflexed, with few rather faint marks; spur rather longer than ovary, tapering gradually for approximately one-third of its length from base and then more rapidly, with a gentle upward sweep to a point.

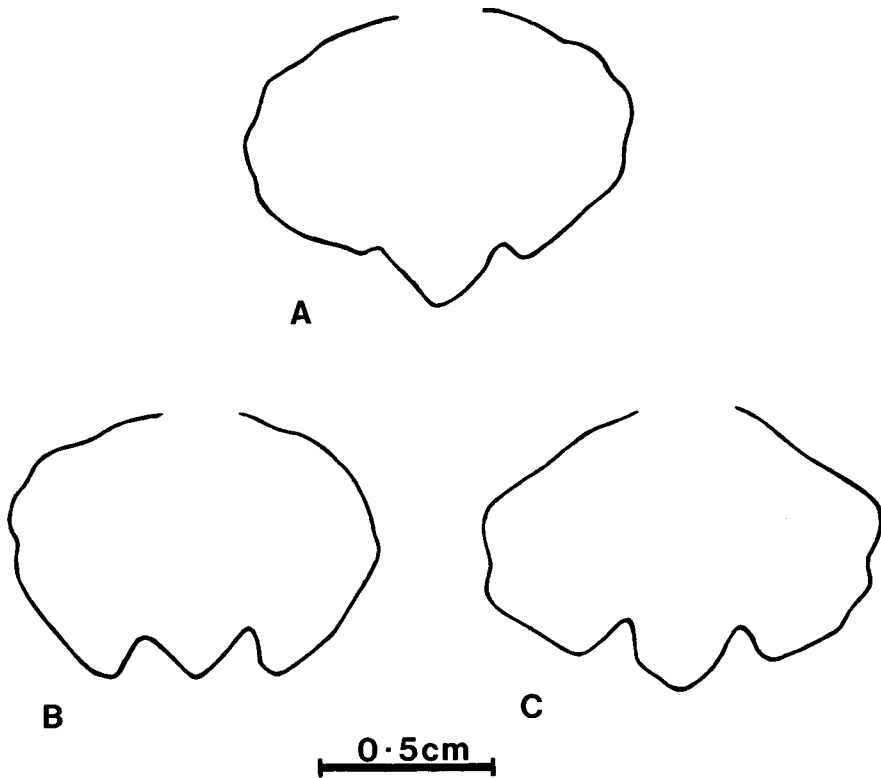


FIGURE 1. Labellum shapes in *Dactylorhiza*  $\times$  *dinglensis* nothosubsp. *robertsii* and its parents. A. *D. majalis* subsp. *cambrensis*, B. *D. x dinglensis* nothosubsp. *robertsii*, C. *D. maculata* subsp. *ericetorum*.

#### ACKNOWLEDGMENTS

I should like to thank R. H. Roberts for confirming my determination of this new taxon, and for the very generous help and encouragement he has given me with my studies of this difficult genus.

My thanks are also due to the v.c. Recorder, Arthur Chater, for all his help and encouragement with this paper, and the referee, for his guidance. I should like to thank Albert Henderson for his help with the Latin translation and Jo Nash for his excellent drawings.

#### REFERENCES

- BATEMAN, R. M. & DENHOLM, I. (1983). A reappraisal of the British and Irish dactylorchids, 1. The tetraploid marsh-orchids. *Watsonia* 14: 347-376.
- BATEMAN, R. M. & DENHOLM, I. (1989). Morphometric procedure, taxonomic objectivity and marsh-orchid systematics. *Watsonia* 17: 449-455.
- ELLIS, R. G. (1983). *Flowering plants of Wales*. Cardiff.
- HESLOP-HARRISON, J. (1953). Studies in *Orchis* L. II. *Orchis Traunsteineri* Saut. in the British Isles. *Watsonia* 2: 371-391.
- HESLOP-HARRISON, J. (1954). A synopsis of the dactylorchids of the British Isles. *Ber. geobot. ForschInst. Rübel* 1953: 53-82.

- ROBERTS, R. H. (1961a). Studies on Welsh orchids, I. The variation of *Dactylorchis purpurella* (T. & T. A. Steph.) Vermeul. in North Wales. *Watsonia* 5: 23–36.
- ROBERTS, R. H. (1961b). Studies on Welsh orchids, II. The occurrence of *Dactylorchis majalis* (Reichb.) Vermeul. in Wales. *Watsonia* 5: 37–42.
- STEPHENSON, T. & STEPHENSON, T. A. (1921). *Orchis latifolia* in Britain. *J. Bot., Lond.* 59: 1–7.

(Accepted December 1990)