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FURTHER NOTES ON DACTYLORCHIS TRAUNSTEINERI (SAUT.) VERMEUL. IN WALES

By W. S. Lacey and R. H. Roberts

Introduction

The first Welsh record of *Dactylorchis traunsteineri* was made in the Lleyn peninsula, Caernarvonshire (v.c. 49), in June 1953 and confirmed the following year (Lacey, 1955).

These notes now present the results of further field work on this species during the last three seasons (1955-1957); they include additional information about the original colony, and details of newly-discovered colonies in the Lleyn and in Anglesey (v.c. 52).

Additional Notes on the Original Colony (*W1*)

The small colony of *D. traunsteineri* at the north end of Cors Geirch in the Lleyn peninsula was revisited on June 22nd, 1955, and again on June 22nd, 1957. On the latter occasion measurements were made of stature, leaf dimensions, occurrence of leaf marking and number of flowers in the inflorescence in 42 plants. These data are summarised in Table 1. In addition, specimens were collected for the measurement of labellum and spur size (Table 2).

Nearly all the plants examined had four leaves and several had only three. This being so, the original specimens described in the first note have been re-examined from herbarium material and the opportunity is here taken to correct an error. Due to a misinterpretation of the procedure given by Heslop-Harrison (1953, p. 378) the *lowest bract* was included in the leaf count. The number of foliage leaves in Table 2 on p. 299 of the original account should therefore be *four,* not five.

Putative hybrids *D. incarnata* subsp. *incarnata* × *traunsteineri* and *D. purpurella* × *traunsteineri* were growing in the same colony.

Details of New Colonies

(i) *Rhyd-y-clafdy, Caernarvonshire, v.c. 49 (W2)*

A second Lleyn colony was also found on June 22nd, 1955, and examined more fully during the 1957 visit. It is situated a short distance north of the village of Rhyd-y-clafdy and approximately $2\frac{1}{2}$ miles south-east of the original locality at the north end of Cors Geirch. Although it is clearly separated from the

TABLE 1

Sample data for four Welsh colonies of *D. traunsteineri*

N = no. of individuals examined; M = arithmetic mean
s = standard error; S.E.M. = standard error of the mean

Sample	N	Stature in cm.			No. of leaves		
		M	s	S.E.M.	M	s	S.E.M.
W 1	42	27·60	5·58	0·860	3·93	0·41	0·063
W 2	44	24·42	3·92	0·592	3·86	0·59	0·090
W 3	55	17·56	4·25	0·574	3·56	0·79	0·106
W 4	101	20·75	5·32	0·529	3·89	0·63	0·063
		Length in cm.			Width in cm.		
W 1	42	11·41	2·15	0·332	1·32	0·31	0·048
W 2	44	9·25	2·45	0·368	1·04	0·24	0·036
W 3	55	8·86	1·93	0·259	1·10	0·18	0·024
W 4	101	10·41	2·10	0·208	1·00	0·20	0·020
		Number of flowers per inflorescence			Leaf marking		
W 1	42	20·71	8·32	1·284	7% of individuals		
W 2	44	13·57	4·75	0·716	22·5% of individuals		
W 3	55	10·47	3·22	0·434	none		
W 4	101	9·73	6·26	0·623	none		

TABLE 2

Sample data for labellum and spur dimensions in Welsh colonies of *D. traunsteineri*. (Specimens from the two Caernarvonshire and two Anglesey colonies taken together. Symbols as in Table 1)

Sample	N	Labellum dimensions					
		Width in cm.			Length in cm.		
		M	s	S.E.M.	M	s	S.E.M.
W 1 + W 2	30	0·84	0·139	0·025	0·77	0·087	0·016
W 3 + W 4	80	1·10	0·150	0·017	0·89	0·099	0·011
		Spur dimensions					
		Width in cm.			Length in cm.		
W 1 + W 2	30	0·32	0·042	0·008	0·86	0·115	0·021
W 3 + W 4	80	0·35	0·039	0·005	0·91	0·108	0·014

latter by an extensive area of rush and sedge meadow, the new locality provides essentially the same kind of habitat, with abundant *Schoenus nigricans*. Minor differences include a lower water table and a shorter, more tussocky growth of *Schoenus*. *D. traunsteineri* plants occur scattered thinly. In this colony 44 individuals were examined in the field for vegetative and inflorescence data (Table 1) and specimens were also collected for labellum and spur measurements (Table 2).

Other orchids growing in the same locality include *Epipactis palustris, Platanthera bifolia, Dactylorchis purpurella, D. incarnata* subsp. *pulchella, D. incarnata* subsp. *incarnata,* and the putative hybrid *D. incarnata* subsp. *incarnata* × *traunsteineri.*

(ii) *Cors Bodeilio,* Anglesey, *v.c. 52* (*W3*)

The expected presence of *D. traunsteineri* in Anglesey has now been confirmed by its discovery in an area of semi-fen near Pentraeth on June 24th, 1956 (see R. H. Roberts, Plant Records, *Proc. B.S.B.I.,* **2**, 147). Specimens have been deposited in the herbaria of the Royal Botanic Gardens, Kew, and the National Museum of Wales, Cardiff.

Cors Bodeilio is a fen-like area situated in a depression in the Carboniferous Limestone about 1½ miles west-south-west of Pentraeth. It consists of a mosaic of areas dominated by *Phragmites communis, Cladium mariscus, Juncus subnodulosus,* and sedge meadow, the configuration being determined largely by drainage and grazing practice in the locality. Fairly extensive areas of *Schoenus nigricans* occur marginal to the *Cladietum* and most of the *D. traunsteineri* plants were found in this, growing loosely rooted in a carpet of mosses between the *Schoenus* tussocks. The colony was visited again on June 3rd, 1957, when 55 plants were examined in the field (Table 1) and specimens collected for labellum and spur data (Table 2).

The list of associated species in Cors Bodeilio is very similar to that given for the original Cors Geirch locality (Lacey, 1955) and need not be included here. The area is particularly rich in orchid species. *Epipactis palustris* should be added to the list already given (*loc. cit.,* p. 299).

The putative hybrid *D. incarnata* subsp. *pulchella* × *traunsteineri* is also common in the Bodeilio locality. A specimen of this hybrid, transplanted in an experimental plot in Bangor, subsequently produced six swollen capsules from an inflorescence of 22 flowers. Two of these were examined and found to have a very high seed sterility (approximately 93%). This is in agreement with a triploid chromosome number for the hybrid plant and supports the idea of its origin from tetraploid *D. traunsteineri* and diploid *D. incarnata,* already clearly indicated by its morphological features.

(iii) *Cors Erddreiniog, Anglesey, v.c. 52 (W4)*

The continued exploration of Anglesey fens during 1957 resulted in the discovery of a further Welsh locality in Cors Erddreiniog on May 25th. Like Cors Bodeilio some three miles to the south-east, which it closely resembles, this rich fen occupies a depression bordered in part by Carboniferous Limestone. The area is of particular interest in providing a second fen habitat in Anglesey for *Ophrys insectifera,* a species which occurs in some quantity here. *D. traunsteineri,* however, is by far the most abundant orchid in this area. The colony appears to be the largest found so far in Wales. In this case 101 plants were examined in the field (Table 1) and specimens again collected for labellum and spur data (Table 2).

(iv) *Cors Goch, Anglesey, v.c. 52 (W5)*

Cors Goch provides a third area of very wet fen and marsh occupying a long hollow in the Carboniferous Limestone. It lies about $1\frac{1}{2}$ miles east of Cors Erddreiniog and $2\frac{1}{2}$ miles north of Cors Bodeilio. Because of the close similarity in habitat between the two latter localities and Cors Goch, *D. traunsteineri* was expected here also but has not yet been found. It is worth noting, however, that putative hybrids of *D. incarnata* subsp. *pulchella* × *traunsteineri* (*teste* V. S. Summerhayes, J. Heslop Harrison) are present in some quantity. All the specimens examined were unusual in having the leaves overtopping the inflorescence. Further work in this rather extensive area may eventually lead to the discovery of the *D. traunsteineri* parent, although thorough searches have already been made. It is possible, of course, that cross pollination has occurred with the Cors Bodeilio or Cors Erddreiniog colonies not far away.

Other orchids present in the immediate vicinity of the *D. traunsteineri* hybrid are *D. purpurella, D. fuchsii, D. incarnata* subsp. *incarnata, D. incarnata* subsp. *pulchella* and albino forms of *D. incarnata.*

Discussion

The sample data from the four Welsh colonies of *D. traunsteineri* have been examined statistically and the comparisons given in Table 3 below have been made on the basis of Student's 't' distribution.

It will be seen that, although the four colonies show some differences amongst themselves, in general they conform with descriptions already given for other colonies by Heslop-Harrison (1953). Three points may be noted, however:—

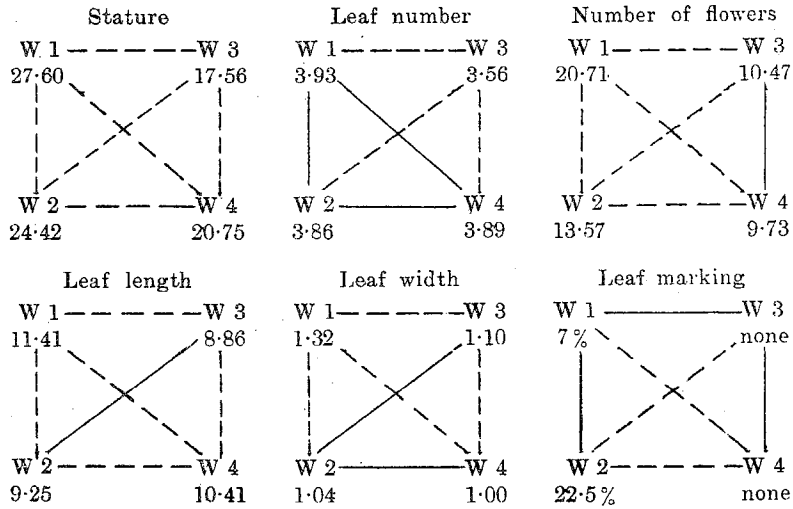
(a) The Cors Bodeilio plants are exceptional in their small stature, low leaf number and short leaf length. While too much reliance cannot be placed on vegetative features, the small size of

TABLE 3

Comparisons of four Welsh colonies of *D. traunsteineri*

——— = no significant difference
– – – – = significant difference
} at 5% level of probability

A. Individual colonies compared



B. Caernarvonshire and Anglesey colonies compared

Stature		Leaf number		Number of flowers	
W1+W2	W3+W4	W1+W2	W3+W4	W1+W2	W3+W4
25·98	19·62	3·90	3·78	17·06	9·99
Leaf length		**Leaf width**		**Leaf marking**	
W1+W2	W3+W4	W1+W2	W3+W4	W1+W2	W3+W4
10·31	9·87	1·18	1·04	13/86	0/156
Spur length		**Spur width**		**Labellum length**	
W1+W2	W3+W4	W1+W2	W3+W4	W1+W2	W3+W4
0·86	0·91	0·32	0·35	0·77	0·89
		Labellum width			
		W1+W2	W3+W4		
		0·84	1·10		

these plants recalls the Yorkshire colonies, the *"Orchis eborensis"* of Godfery (1933), which, according to Heslop-Harrison (1953), may also belong to *D. traunsteineri.*

(b) Plants from both of the Caernarvonshire colonies differ appreciably in labellum width from any so far described in Britain (compare, for example, Table V, p. 382 and Fig. 4, p. 383 in Heslop-Harrison (1953), and also data for Anglesey colonies in Table 2 of this paper). Indeed, the labellum width in the Caernarvonshire colonies falls within the range for *D. purpurella* (Stephensons' Form B, 1920) as found in North Wales, while in the Anglesey colonies it approaches *D. praetermissa.*

(c) The Anglesey plants show marked differences from the Caernarvonshire plants in stature, leaf width, leaf marking, number of flowers in the inflorescence, labellum dimensions and spur width. While differences in such features as stature, leaf width and flower number may very well be due to environmental differences, the absence of leaf marking and significantly greater spur and labellum dimensions in the Anglesey plants suggest a real genetic difference. In the small number of flowers in the inflorescence the Anglesey specimens resemble the Bavarian and Swiss forms which, according to Sauter (1837) quoted by Pugsley (1946), had 6 to 12, rarely 20 flowers.

The new Welsh records described above, together with a recent further find in Co. Antrim (Heslop-Harrison, 1956), offer support to the view expressed earlier (Lacey, 1955) that *Dactylorchis traunsteineri* would prove to be widespread in Britain.

ACKNOWLEDGMENTS.

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AN INTRODUCTION TO THE BRITISH SPECIES OF CALLITRICHE

By R. W. David

Fools rush in . . . .; but our picture of this genus has become so much clearer in the last few years, notably as a result of Dr. H. D. Schotsman's study of *Callitriche* in Holland*, that it seems a pity no news of these advances should reach the amateur botanist until the angels have made up their minds on all the details.

The genus *Callitriche* falls into two sections, *Callitriche* (*Eu-Callitriche*) and *Pseudo-Callitriche,* the latter being readily distinguishable by the leaves on each plant being all of one form, thin and transparent in texture, and lacking stomata, by the flowers arising directly in the leaf axils, without bracts (in the other section the flower is always contained within a pair of bracts, though these may be early deciduous), and by the four lobes of the fruit becoming easily separable when ripe.

Two species of section *Pseudo-Callitriche* occur in Britain. One, *C. truncata* Guss., is a very rare plant of mid and southern England (south of latitude 53½°N); the other, *C. hermaphroditica* L. (*C. autumnalis* L.), is restricted to the north of this line, but is there more frequent, in canals and lakes. *C. truncata* I have seen in Kent, Sussex, Somerset and in the Channel Islands, and once seen it is unforgettable for the rich, translucent quality of the leaves, bright deep green, shot with something approaching peacock-blue. At first sight the plant has the appearance almost of an alga. The leaves are very uniform, about a centimetre long or less and two millimetres wide, more or less parallel-sided until they taper suddenly to a slightly notched apex. In the wild *C. truncata* seems to make only small tufts, hugging the bottom of the stream, but Mr. J. P. Savidge, who has cultivated it at the Hartley Botanical Laboratories, Liverpool, tells me that it elongated rapidly there, and bore fruit. This it is usually very shy to do. I have once found a single fruit, and this was small (little more than one millimetre), and in general outline round. The lobes were neatly edged with a blunt rim but were in no sense winged. The whole fruit showed a tendency to blacken as it ripened.

The northern plant, *C. hermaphroditica,* is much bigger, with leaves much longer (up to 2 cm.) but not much broader than

*A Taxonomic Spectrum of the Section Eu-Callitriche in the Netherlands, *Acta Bot. Neerl.*, **3**, 313-384.