

PLANT PORTRAIT

1104. *Dactylorhiza purpurella* (T.Stephenson & T.A.Stephenson) Soó

Orchidaceae

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Summary

Dactylorhiza purpurella (NORTHERN MARSH ORCHID) is illustrated here (t. 1104). It is a north-western European allotetraploid species, and allotetraploidy and different treatments of the diploid progenitors of this and other allotetraploids in the genus have led to a complicated taxonomic history. A detailed description is provided, with notes on the habitat. Its conservation status has been assessed as Least Concern in Britain, although populations may be at risk from drainage and other agricultural change. It is available for sale from specialist nurseries; notes on cultivation are provided.

INTRODUCTION

Dactylorhiza Neck. ex Nevski is a genus of tuberous terrestrial orchids, native to the temperate and subarctic regions of the Northern Hemisphere. Currently, Plants of the World Online (POWO, 2023) lists 34 accepted species, but the taxonomy of the genus is complex, and many taxa have been treated at different taxonomic levels by different authors (see, e.g. Pillon et al., 2007). This has resulted in many synonyms, and there is currently no consensus about which taxa should be recognised at which level. For example, *D. purpurella* (T.Stephenson & T.A.Stephenson) Soó (NORTHERN MARSH ORCHID; DWARF MARSH ORCHID), the subject of this account and Plate 1104, has been treated as a distinct species, a subspecies or a variety by different authors (POWO, 2023).

In addition to diploid species, the genus includes at least one potential autotetraploid (*D. maculata* (L.) Soó; HEATH SPOTTED ORCHID) and a number of allotetraploid species derived from hybridisation between two diploids or between a diploid and a tetraploid. Some triploids resulting from hybridisation between diploids and tetraploids also occur. Hybridisation is a major driver of diversification in the genus; on the basis of a high-throughput sequencing study, for example, Brandrud et al. (2020) grouped most of the allotetraploids in Europe and western

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Asia in six groups, derived from crosses between *D. euxina* (Nevski) Czerep., *D. fuchsii* (Druce) Verm. (COMMON SPOTTED ORCHID), *D. incarnata* (L.) Soó (EARLY MARSH ORCHID), *D. maculata*, *D. saccifera* (Brongn.) Soó and *D. umbrosa* (Kar. & Kir.) Nevski. This situation is further complicated by the occurrence of frequent hybrids between the named taxa (e.g. Averyanov, 1990, pp. 180–183).

Dactylorhiza purpurella was first recognised as a distinct species in 1920 (as *Orchis purpurella* T.Stephenson & T.A.Stephenson) on the basis of material growing in a hay meadow in West Wales, near Aberystwyth, but with reference to other material from the English Lake District and the Isle of Arran (Stephenson & Stephenson, 1920). Brooke & Bone (1950) wrote that “So distinct is this orchid in general appearance from the other dactylorchises, that its comparatively recent recognition as a separate species is surprising” adding that “at the same time, many British botanists—wherever they may have happened to live—seem to have possessed ... a blindspot where the marsh orchids are concerned”.

Dactylorhiza purpurella is an allotetraploid, formed by hybridisation between the diploids *D. fuchsii* and *D. incarnata* (L.) Soó (see account for the latter species in this issue; Fay, Raistrick & Sayers, 2024) or their ancestors (e.g. Pillon et al., 2007; Brandrud et al., 2020); it shares this parentage with a group of north-western and central European allotetraploids including *D. baltica* (Klinge) Verm., *D. elatior* (Fr.) Soó, *D. majalis* (Rchb.) P.F. Hunt & Summerh., *D. praetermissa* (Druce) Verm. (SOUTHERN MARSH ORCHID) and *D. traunsteineri* (Saut. ex Rchb.) Verm. (Brandrud et al., 2020, and references therein). *Dactylorhiza francis-drucei* (Wilmott) Aver. is another member of this group, and it has a particular chequered taxonomic history, with recent floras including it in *D. majalis*, *D. traunsteineri* or *D. traunsteinerioides* (Pugsley) Landwehr (see, e.g., POWO, 2023) or as *D. francis-drucei*.

Despite this shared ancestry, there is evidence that these taxa were formed at different times and in different places (Pillon et al., 2007; Eriksson et al., 2022), and they have distinctive morphology, ecology etc. For these reasons, we follow authors including Brandrud et al. (2020) and treat them as species.

A further complication in the taxonomy of *Dactylorhiza* allotetraploids in Europe is that some authors treat diploid *D. fuchsii* and *D. saccifera* as *D. maculata* subsp. *fuchsii* (Druce) Hyl. and subsp. *saccifera* (Brongn.) Dilic, respectively, despite the fact that genetic data show that the Madeiran endemic diploid *D. foliosa* is more closely related to *D. maculata sensu stricto* than either is to *D. fuchsii* or *D. saccifera* (e.g. Pillon et al., 2007). Some authors also treat the allotetraploids derived from hybridisation between *D. incarnata* and *D. maculata sensu lato* (including *D. fuchsii* and *D. saccifera*) as subspecies of a single allotetraploid species, *D. majalis sensu lato* (e.g. Kühn, Pedersen & Cribb, 2019, 2024). In such systems, *D. purpurella* (as used here) appears as *D. majalis* subsp. *purpurella* (T.Stephenson & T.A.Stephenson) D.M.Moore & Soó.

Like other members of *Dactylorhiza*, *D. purpurella* hybridises freely with other *Dactylorhiza* species, including *D. fuchsii*, *D. incarnata*, *D. maculata*, *D. praetermissa* and *D. viridis* (L.) R.M. Bateman, Pridgeon & M.W.Chase (FROG ORCHID, previously treated as *Coeloglossum viride* (L.) Hartm.; see Fay, Sayers & Taylor, 2015, and references therein), and hybrids with members of other genera including *Gymnadenia* R.Br. (FRAGRANT ORCHIDS) have also been recorded (see, e.g., Lang, 1980; Stace, 2010).

CULTIVATION

Dactylorhiza purpurella is sometimes available for purchase from specialist nurseries. It grows best in neutral to alkaline soils in part shade, but it will tolerate full sun if the soil remains damp. Plants can be lifted and divided in spring if required. Seaton et al. (2011) provided a detailed account of propagation of *Dactylorhiza* species from seed to flowering plants.

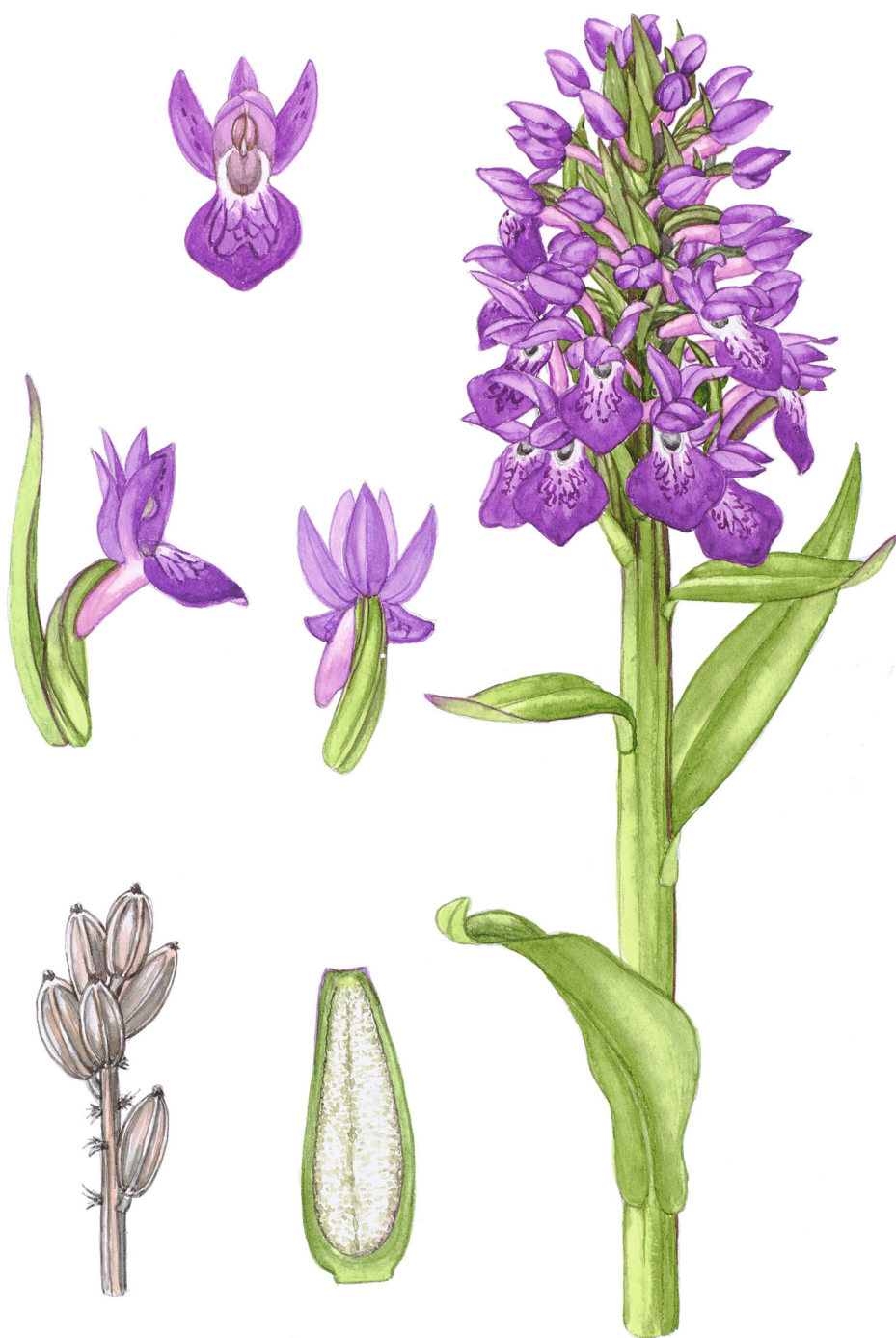


PLATE 1104 *Dactylorhiza purpurella*

REINHILD RAISTRICK



PLATE 1104A *Dactylorhiza purpurella*

REINHILD RAISTRICK



FIGURE 1 *Dactylorhiza purpurella*. A, plant, $\times 1$; B, dorsal sepal, $\times 4$; C, lateral sepal, $\times 4$; D, petal, $\times 4$; E, column, spur, base of lip & part of ovary $\times 6$; F, column and base of lip, $\times 6$; G, pollinaria $\times 16$. Drawn by Stella Ross-Craig for *Drawings of British Plants* part XXVIII Hydrocharitaceae, Orchidaceae (1971) [Correction added on 14 August 2024, after first online publication: ‘*Dactylorhiza purpurella*’ has been added in the Figure caption.]

NOMENCLATURE AND DESCRIPTION

Dactylorhiza purpurella (T.Stephenson & T.A.Stephenson) Soó, Nom. Nov. Gen. *Dactylorhiza*: 5 (1962).

Homotypic synonyms include:

Orchis purpurella T.Stephenson & T.A.Stephenson in J. Bot. 58: 164 (1920). Type: described from Wales, “near Aberystwyth in a very old hill pasture”.

Dactylorchis purpurella (T.Stephenson & T.A.Stephenson) Verm. in Stud. Dactylorch.: 67 (1947).

Dactylorhiza majalis subsp. *purpurella* (T.Stephenson & T.A.Stephenson) D.M.Moore & Soó in Bot. J. Linn. Soc. 76: 367 (1978).

Dactylorhiza majalis var. *purpurella* (T.Stephenson & T.A.Stephenson) R.M.Bateman & Denholm in Watsonia 14: 370 (1983).

Tuberous perennial, *tubers* digitate, long and tapering. Annual *stem* 10–15(40) cm high, “squeezeable”, solid part of stem >50% of the diameter. Dormant in winter; *leaves* from early spring, 4–8, cauline, but often clustered towards base of stem, keeled, lanceolate, tapering to a fine point, widest in the middle, often spotted on upper surface, spots regularly distributed or only at tips, often indistinct; never large spots, rings or blotches. Largest leaf 7–12(16) cm long, 1.7–3.0(3.5) cm wide. Lower *bracts* purplish, barely exceeding flowers. *Inflorescence* short, 3–5(10) cm, compact, ovoid-subcylindrical, flattened at the top. *Flowers* 10–30(80), bright purple or reddish-purple. *Sepals* broad, erect; lateral sepals, 6.0–8.5 mm long, 2.5–3.5 mm wide; dorsal sepal forming hood with petals. *Petals* up to 5–6 mm long. *Labellum* +/– flat, (5) 6 (9) mm long, (6) 8 (12) mm wide, edges slightly reflexed, blunt diamond-shaped, scarcely or not trilobed, with heavy markings mostly near the midline. *Spur* stout, 6–10 mm long (shorter than the ovary), 2.0–3.5 mm wide. Chromosome number $2n = 4x = 80$. (Based on Stephenson & Stephenson, 1920, with additions from Delforge, 1995). Plates 1104, 1104A. Figure 1.

DISTRIBUTION. A north-western European species found in Great Britain, Ireland, Denmark, Faroe Islands, Netherlands and Norway. Plate 1104A illustrates shows this species growing on Lindisfarne, off the north-east coast of England.

HABITAT. *Dactylorhiza purpurella* (as *Orchis purpurella*) was described from plants growing in Wales “near Aberystwyth in a very old hill pasture” (Stephenson & Stephenson, 1920). It can be found in open moist grassland and wet meadows, clifftops, dune slacks and streambanks on neutral to alkaline soils, forming large populations in suitable conditions; it can occur from 0 to 600 m a.s.l. (e.g. Kühn et al., 2019).

FLOWERING TIME. June to early August.

IUCN CATEGORY AND CONSERVATION. *Dactylorhiza purpurella* has not yet been assessed for the Global Red List of IUCN, but it was assessed as Least Concern in Great Britain (Cheffings et al., 2005). In suitable habitats, it can form large colonies, but drainage and other agricultural improvement could be a risk to some populations. Given its north-westerly distribution, it is not impacted by collection for *salep* or other purposes, unlike more south-eastern species of *Dactylorhiza*, e.g. *D. euxina*.

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