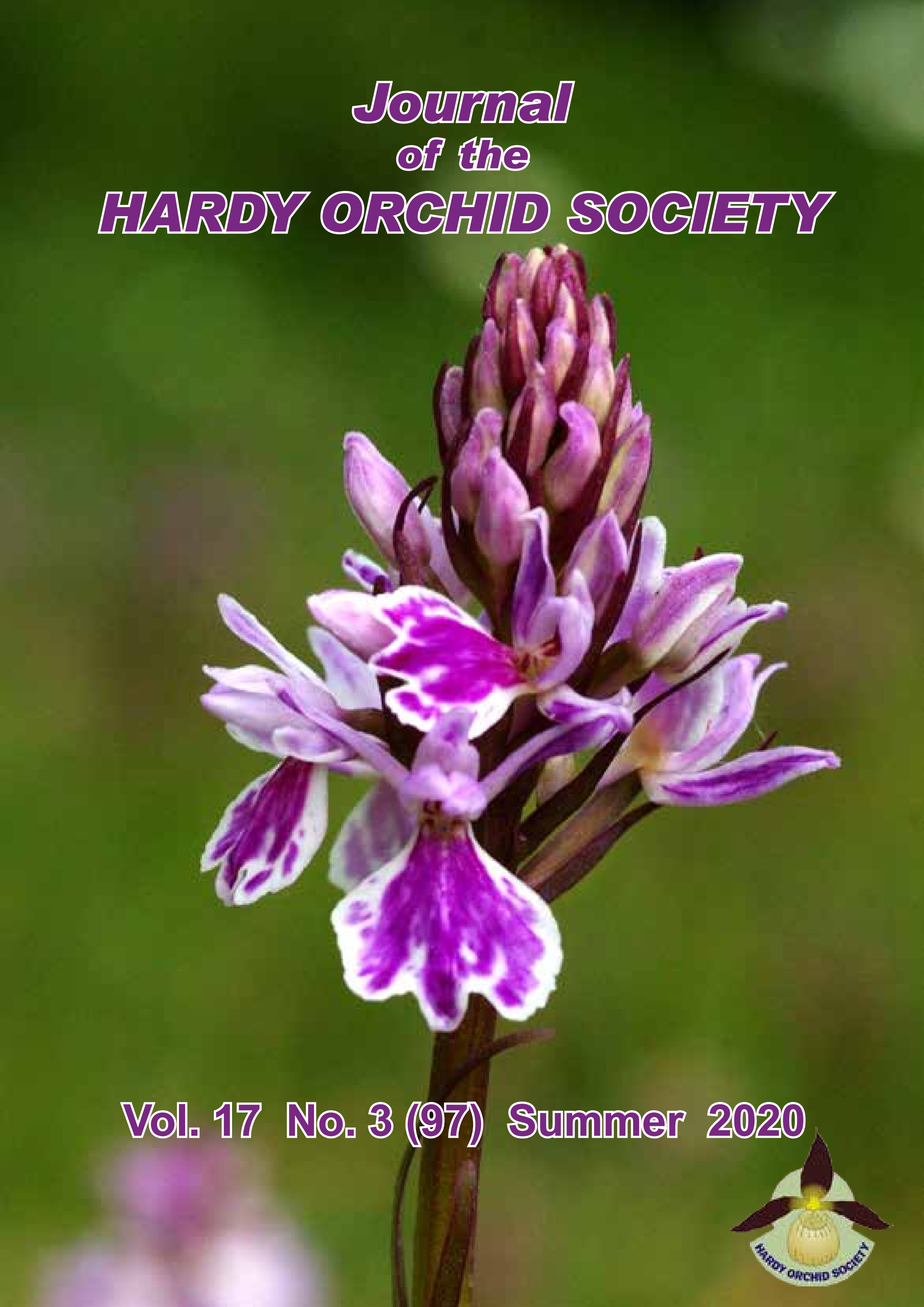
Journal
of the
HARDY ORCHID SOCIETY



Vol. 17 No. 3 (97) Summer 2020

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Front Cover Photograph

Anthocyanin rich *Dactylorhiza maculata* from Southampton Common photographed by Simon Melville. See report on page 106.

Rear Cover

Purple form of *Anacamptis pyramidalis* from the southern Alsace in France photographed by Phillip Cribb. See article on page 98.

JOURNAL of the HARDY ORCHID SOCIETY Vol. 17 No.3 (97) Summer 2020

The Hardy Orchid Society

Our aim is to promote interest in the study of Native European Orchids and those from similar temperate climates throughout the world. We cover such varied aspects as field study, cultivation and propagation, photography, taxonomy and systematics, and practical conservation. We welcome articles relating to any of these subjects, which will be considered for publication by the editorial committee. Please send your submissions to the Editor, and please structure your text according to the "Advice to Authors" (see Members' Handbook, website www.hardyorchidsociety.org.uk, or contact the Editor). Views expressed in journal articles are those of their author(s) and may not reflect those of HOS.

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Editorial Note

Mike Gasson

I hope that this *JHOS* finds you all safe and coping with the restrictions with which we are all living. In that regard there are several important notices within this issue and from our new Chairman, Carol Armstrong. Please take time to check these out as it concerns necessary changes to meetings and events, as well as some steps being taken to provide modified activities. Despite the impact on individual and society activities we have managed to put together a varied and interesting issue. The HOS Forum in part stimulated another interesting article from our President Richard Bateman this time addressing the sometimes confusing issue of identifying Pugsley's Marsh-orchid and its 'false' version in the south and east of England. Do keep sending in articles as I suspect restrictions on travel this year may well impact on available material for the forthcoming issues of *JHOS*.

Chairman's Note

Carol Armstrong

Well, the circumstances that we find ourselves under are not quite how I imagined that my term as Chairman of the Hardy Orchid Society would start. As he hands over the role to me, I would like to thank Colin Scrutton for the service he has given to the Society as our Chairman. He has now become our Vice-Chairman.

First of all, I hope that members and their families have avoided infection during this pandemic. I know that many of the activities that we enjoy in the pursuit of our hobby have been cancelled, or at least curtailed, and for some there will have been a necessity to be isolated, possibly putting a strain on mental health and well-being. The financial impact of the lockdown may also have taken its toll on some and the Committee have agreed to offer help to anyone suffering financial difficulties due to the pandemic by providing free membership for the current subscription year. Any current member wishing to apply for assistance should contact the Membership Secretary, Moira Tarrant. All applications will be treated in the strictest confidence.

Sadly, the need to observe social distancing to ensure the safety of members has led to the cancellation of some of the activities in our 2020 members' programme. The Spring Meeting with the AGM and Plant Show had to be cancelled. It is hoped that the AGM can be held as part of the November meeting, as long as that meeting can take place. Although we had hoped to retain the Northern Meeting that has also had to be cancelled as a precaution. In the meanwhile, our Speaker's Secretary has been exploring ways of bringing topics of interest to the membership via an alternative presentation medium. (See Celia Wright's note on page 78).

We have had to abandon the Field Trips Programme that Richard Kulczycki put a great deal of effort into arranging. It is hoped that the programme can be re-instated in 2021 and many walks leaders have indicated that they would be willing to offer their itinerary again next year. Our popular Seed Sowing Workshop could not be staged due to rules on social distancing and the current ban on indoor meetings. This will be re-arranged for 2021 (guidelines permitting) – watch for announcements on the website and forum.

That's enough of what we are unable to do – let's look at what we can do! The Committee brought a "can-do" experiment to our Committee Meeting in May as we used the forum to facilitate a virtual meeting by email for Committee members thereby allowing HOS business to continue. The new HOS forum is now operational, thanks to Neil Evans and Moira Tarrant. I would strongly advise all members to join our forum – the invitations have been sent. The forum provides a fantastic communication channel, particularly in these difficult times.

The Video and Photographic competitions will still take place but with a relaxation of the rules for entries to recognise the difficulties that this year presents. (See note from Neil Evans and Steve Pickersgill on page 97).

The Hardy Orchid Society Conservation Award scheme to encourage wider public awareness of wild orchids and their conservation is moving forwards. We continue to hope to make the first awards in 2021. I am pleased to report that Andrew Parsons has volunteered to take up the role of Publicity and Outreach Officer for us. We will need further volunteers to help on the committee at the end of April next year as our Vice-Chair, Secretary and Plant Show Secretary will be retiring from these roles. Please think about it and ask the incumbents about the roles.

Our Journal continues to be an important link between members and I hope you enjoy this edition. If you have any content that you'd like to share via our Journal, please contact Mike Gasson, our Journal editor. Perhaps you did manage to get to see orchids on holiday this year before travel was stopped or perhaps you had a more productive time looking after your plants and gardens? We would all enjoy reading about what you did under lockdown. Please tell us about what you learnt or discovered about orchids during this unusual year. So, as you see, much is continuing to happen and other ideas and initiatives are under consideration to ensure the Society continues to thrive despite the current restrictions. Stay Safe!

Hardy Orchid Society Forum – Please Join Your Fellow Members

One of the benefits of being a member is that you have access to a members-only email forum. It is a resource to ask for help and to share information with one another. Recent posts have included requests for opinions or identifications of unusual orchids, asking for growing advice and site information requests for bee orchid variants. Half our membership is now signed up. The site replaces the Yahoo site we used before, but were forced to abandon when Yahoo policy changes removed essential functionality and made us vulnerable to abuse and scams. The new site is moderated. This means the message is checked by a human before it is re-sent to all subscribers. This means we can block any messages sent by a computer virus, for example. Usually it is a matter of minutes before your message is moderated, but occasionally it can take a few hours. Please be patient.

Sometimes members of the Committee may use the forum to send special, usually urgent, information. We anticipate occasionally having to do this while coronavirus is about. The forum may need to be used for the photo and video competitions in particular, or we may need to make urgent announcements about HOS meetings.
You can login into the forum site to load photos or files. You can also change your delivery options to send groups of messages or to send special messages only. You can easily unsubscribe from the forum without contacting us – there is an automated

link on each message to do this. We would prefer you to at least receive "special notices". Please never mark our messages as spam.

To join please send an email to main+subscribe@HardyOrchidSociety.groups.io You should send from the email address we hold for you – alternatively we must have your membership number. We expect you to use the name members know you by. We will check your details against the current membership database and, if there are no queries, we will send you an invite to the forum. If you have a support issue, please email Neil Evans or Richard Kulczycki (see inside cover for emails) and we will try to help as best we can. We have over 300 members signed up and so far there have been very few problems. Please join us.

Leeds and Autumn Kidlington meetings 2020

Celia Wright, HOS Speaker Secretary

My usual role as Speaker Secretary for HOS is to find speakers for the three meetings we hold each year and link them into balanced programmes that cover as many aspects of hardy orchid interest as possible so that all members will, I hope, find something to interest them. This year has been decidedly different. The Covid-19 pandemic and the UK government's management of the associated risks has forced changes on our behaviour that have included embargoes on indoor meetings with those outside our immediate families. We cancelled the Kidlington Spring meeting in March not long before lockdown and since then have kept a careful watch on government edicts that would control whether or not we could meet in September and November this year.

As I write this, public indoor gatherings remain very restricted. To gauge members' feelings about attendance if government advice were to change I have surveyed by email and phone all but three of the members who came to Leeds last year to ask whether they would come in 2020 if the government permitted this. 21 members replied that they would come, 24 replied that they would not and seven were uncertain. I also spoke to our four speakers booked for this September's meeting. Two did not wish to attend and a 3rd speaker's topic was so closely linked to one of the other two that it became clear that we could not offer the programme I had planned. Added to this an absence of any government indication that such meetings will be permitted in early September, it became inevitable that the Leeds meeting this year would be cancelled. It is quite likely that the Autumn Kidlington meeting will also be cancelled; the committee's final decision on this will be publicised in the Autumn issue of the Journal as well as on the website and Forum.

So what are we doing instead? While we cannot replace all the social aspects of a meeting, there will be electronic talks to enjoy and a video competition. Talks will be accessed via the HOS website. Steve Pickersgill is planning to run the video competition from the website and members will be able to vote via the Forum. If you are an HOS member but not yet a Forum member, email Moira Tarrant, our

Membership Secretary, at moira.tarrant@outlook.com for an invitation to join. For both members of a Joint membership to vote both members must register individually.

Most of our speakers use PowerPoint to display their talks at our meetings so I have investigated how we could build on this. PowerPoint presentations are easily saved as a Show where the slides are timed and run automatically. Further information can be added either as extra explanatory text on the screen or via a voice recording specific to each slide, a facility described by Microsoft as Narration. Using a brief presentation that I gave in 5 minutes in 2007, I made a text rich alternative and a narrated one. It wasn't too difficult and resulted in Slide Show presentations that are straightforward to save as videos. I have posted some examples and instructions on how to make a narrated presentation on the Forum for members to download. The website version also has video examples.

Colin & Angela Scrutton have kindly agreed to develop their talk on the Orchids of Lesbos. I want to replace the other talks with a series of short (5-10 minutes) presentations under the overall title "Meetings with Hardy Orchids". I have one or two offers of such presentations already and would like a lot more before I put the programme together. Anything with a hardy orchid interest is welcome. Please contact me at celia.wright@windmill.me.uk or 01743 884576 if you are considering providing a presentation or need help. I need to receive your presentations by August 26th and suggest you use the free WeTransfer service to send them. In early September I will post a list on the Forum of the presentations we can make available.

Temperature and Orchids 1: Winter Chilling, Global Warming and Hardy Orchids (especially *Cypripedium calceolus*)

David Trudgill

Many British orchid species become dormant in the autumn and this article firstly explores the role of changing day-length and winter chilling in breaking dormancy/ initiating bud growth in the spring. The mini experiments described here involve mature plants lifted from the paths in our meadow and grown in pots. The second part of this article examines the implications of our warming climate for orchid species such as *Cypripedium calceolus* that require a period of chilling before they can re-start growth in the spring.

Winter Chilling

Eight pots growing *Dactylorhiza* spp. (a mixture of *D. purpurella* and *D. fuchsii*) were split into two groups of four pots. One group was maintained from October 2016 in an unheated out-building, the other on a cool, north facing window sill within our house (temperature >9°C). All plants were moved to a cold-frame in early April 2017. The experiment was repeated in 2017/8 (but with only three replicates), and also included three replicates of *Platanthera bifolia*. The results were similar for both years. The buds of the *Dactylorhiza* spp. kept in the out-building started to appear above the soil surface in late-March as temperatures increased; the *P. bifolia* two or three weeks later. In contrast, the buds of the plants in our house appeared above the soil surface several weeks earlier. However, as is shown in Figures 1 and 2 (the second experiment photographed on 20th May 2018) the subsequent growth of the indoor plants was much slower and they were stunted compared with those kept in the out-building.

These results support observations by Rasmussen (1995) that during micro-propagation of hardy orchids many species, including *Cypripedium calceolus* (Lady's-slipper Orchid) and species of *Dactylorhiza*, required a period of chilling before growth will re-start in the spring. Typically, the tubers or rhizomes with buds need two to three months in a fridge at <5°C. John Haggar in his micro-propagation protocol states 'the protocorms of summer-green species will not produce roots and leaves until they have a winter simulating cold period – usually three months in the refrigerator'. However, in my experiments the plants that were kept in-doors through the winter did not remain fully dormant, indicating that the passage of time may also be a factor initiating growth.

Fig. 1: *Dactylorhiza* spp. Fig. 2: *Platanthera bifolia*
In both cases the three pots at the back were maintained in an unheated out-building from mid-October to mid-April and the three in the front were kept in our house.


VERNALIZED
NOT VERNALIZED
DACTYLORHIZA SPP.
20/05/18


VERNALIZED
NOT VERNALIZED
PLATANTHERA BIFOLIA
20/05/18

Day-length

The potential influence of day-length was also tested on *Dactylorhiza* spp. (a mixture of *D. purpurella* and *D. fuchsii*) in pots plunged in soil out of doors. In mid-October 2016 light-proof covers were placed over three pots and three were left uncovered. In the spring of 2017 there was no apparent difference in the timing of bud emergence from the soil but, when the plants were photographed on the 17th April 2017 it was evident that the shoots of those held in the dark had become elongated (Figure 3). Therefore, increasing day-length appears not to be a factor initiating bud growth in the spring.

Figure 3. The three pots of *Dactylorhiza* spp. on the right were kept in the dark from mid-October to early April, and the three on the on left were kept in the light. Thereafter they were all in the light until 17th April. The meadow from which the plants came is in the background with Cowslips coming into flower.

Increasing Winter Temperatures

The average annual temperature of the UK has increased ca. 1.5°C since the 1880s creating opportunities for orchids to extend their distributions northwards (Trudgill 2017). However, for orchids with a chilling requirement it is the minimum winter temperatures that are crucial. The historic records available for each of the UK's met. stations provide two average temperature values for each month – the averages of: 1) the daily minimum and 2) the daily maximum. In Table 1 (A) I present the average minimum temperatures and (B) the average mean temperature (mean of the minimum and maximum) for the three coldest months for the periods 1899-1918 and 1999-2018 from five met. stations. These met. stations were selected because they had all started before 1890 (see – https://www.metoffice.gov.uk/research/climate/maps-and-data

	Altitude	**A)** Average lowest temperature		**B)** Average mean temperature *	
		1899-1918	1999-2018	1899-1918	1999-2018
Armagh	62m	1.4	1.9	4.3	5.1
Durham	102m	0.3	1.2	3.2	4.2
Oxford	63m	1.5	2.2	4.3	5.3
Sheffield	131m	1.4	2.2	4.0	4.8
Stornoway	15m	1.4	2.4	4.3	5.0
Mean		1.2	2.0	4.0	4.9
C)					
Eastbourne	7m		3.8		6.3
Valley	10m		3.7		6.1

Table 1: A) Average lowest, and B) average*mean temperature (°C) for the three coldest winter months for two 20-year periods 100 years apart at five sites, and C) for Eastbourne and Valley for 1999-2018.
*The met. office provides a mean of the warmest and the coldest temperatures for each month. The monthly mean is calculated as the average of the two. Here I give only the averages of the three coldest winter months.

Of these five met. stations Durham had the coldest winter weather (Table 1), reflecting its altitude and location in the east of Britain. The overall average for these five sites indicates that the average minimum temperature for the three coldest months had increased by 0.8°C and the average mean temperature had increased by 0.9°C. At two sites (Armagh and Oxford) the mean temperature for the coldest three months in the period 1999 to 2018 was now >5°C (Table1).

Days with an Air Frost

The met. station historic data also gives the number of days per year with an air frost. Stornoway had the fewest and Durham the most. The average number of frosty days for the five sites in the period 1990 to 2016 (33.8 days) had decreased by 24% compared with the period 1890 to 1929 (44.5 days).

Met. Stations in Areas with Warmer Winter Weather

The five met. stations for which long-term data is available were in very different parts of the UK, and at different altitudes, but none were in the mildest parts of Britain i.e. the south coast of England and the west coast of Wales. Here I present data for two met. stations – Eastbourne (50.76N, 7m above sea level on the south coast of England) and Valley (53.25N, 10m above sea level on the Anglesey coast, Wales) – that have relatively mild winters. The average minimum and mean temperatures for the period 1999 to 2018 were 3.8°C and 6.3°C for Eastbourne, and 3.7°C and 6.1°C for Valley (Table 1 (C)), and there was an average of only 14 and 18 days with an air frost respectively. There were year to year differences and the average minimum temperature for any of the three coldest months never fell below 5°C at Valley in 2007 (mean 5.0°C) and in 2014 (mean 5.0°C), and in Eastbourne in 1990 (mean 5.9°C) and 2007 (mean 5.4°C).

Cypripedium calceolus

The data for all seven met stations shows that UK winters have become less cold. Consequently, winter temperatures on the coastal areas represented by the Eastbourne and Valley met. stations may, in years with mild winters, be too high to provide adequate chilling for orchid species with this requirement. The station at Valley in Anglesey is the most representative for Gait Barrows (54.20N, alt. 54m) that is one of the areas for the re-introduction of *C. calceolus*. Although Gait Barrows is c. 100km further north and 50m higher than the met station at Valley, it still seems likely that the mean temperature for the three coldest months at Gait Barrows might now be >5.0°C, close to the upper threshold for adequate chilling. Harrap & Harrap (2009) comment that *C. calceolus* 'is absent from the Atlantic fringes of Europe and that the English populations were therefore always out on a limb'. Following an exceptionally mild winter in southern Sweden in 2007-8 nearly 400 plants of *C. tibeticum* and *C. macranthos* 'types' did not emerge in the spring and died due to inadequate chilling (Malmgren & Nystrom, see http://www.lideforestgarden.com/orchis/cypripedium_eng.htm). For the last ten years Irmin Vogler, who has long experience of growing *Cypripedium* spp. in the Berlin area of Germany, has no longer been able to successfully grow, out-doors, plants of several *Cypripedium* spp. and hybrids, including *C. calceolus*, because the shoots have become much weaker (pers. comm.). The Berlin winters have become wetter and milder and do not seem to be cold enough to provide 'a successful over-winter period' (I. Vogler pers. comm.).

Winter Chilling Discussion

The simple experiment I did supports the suggestion that orchid species that become dormant in the winter require a period of chilling to help overcome that dormancy and ensure normal growth. However, although stunted when not chilled, they did grow and this may have been because plants have an 'internal (circadian) clock' and are able to sense the passage of time (McClung 2006).

If we focus on *C. calceolus*, the data from the Durham met. station clearly indicates that UK winters in north east England are still cold enough for it to receive adequate chilling. The west of England is much milder and the temperature data for the met. station at Valley on Anglesey suggests that chilling might be inadequate in some winters. However, Ian Taylor (Natural England) commented that the plants that had been re-introduced at Gait Barrows (NW Lancashire) had not (yet) shown any problems attributable to insufficient chilling. There are several uncertainties when trying to interpret the biological impact of data from met. stations e.g. they measure air temperatures at 2m above the ground, and temperatures at the soil surface may, especially on nights with clear skies, be less than those recorded. Also, as observed with *Arabidopsis thaliana* (Wollenberg & Amasino 2012), temperatures >5°C might still provide adequate chilling, only requiring longer exposure, and populations from different climatic zones may have been selected for appropriate but different chilling requirements (Malmgren pers. comm., Stinchcombe *et al*. 2005).

Wider Considerations

Global warming has resulted in a northerly shift in the distribution of many butterflies in the northern hemisphere. Of greater relevance to this article is the observation that the southern edge of their distributions has also shifted northwards (Franco *et al*. 2006; Parmesan *et al*. 1999). This may be due to increased summer temperatures being less favourable for some species with the result that they are out-competed by species adapted to warmer conditions.

In contrast, despite temperatures increasing, the distribution boundaries of many orchids in Britain and Western Europe have not moved northwards, and some have declined. Changes in land-use are probably responsible (Bell 2015; Vogt-Schilb *et al*. 2015). Vogt-Schilb *et al.* found that the declines were greatest for rare, protected species, despite their status. Currently, the guidelines for re-establishing species require them to be re-introduced into areas within their historic range (see Maschinski & Albrecht 2017). Our changing climate will, I suggest, require a more forward looking and rational approach to conservation and management, including translocating species to more northerly areas outside their historic range. From an analysis of the BSBI distribution records Bell (2015) observed that some plant species had northerly out-posts that were attributed to 'assisted migration'. It is possible that spread of *Ophrys apifera* (Bee Orchid) into eastern Scotland is one such instance as the new sites are all adjacent to the A1 and/or to power stations (Trudgill 2017). However it got there, it appears to have received a warm welcome (Anon. 2017)!

References

Anon. (2017) Bee Orchids are discovered for the first time growing in Berwickshire. *Berwick Advertiser:* 19th July.

Bell, A.K. (2015) Changes to plant distributions in Britain. *Ph.D. Thesis, University of York.*

Franco A.M.A. *et al*. (2006) Impact of climate warming and habitat loss on extinctions of species' low-level boundary ranges. *Global Change Biology* 12: 1545-1553.

Harrap, A. & Harrap, S. (2009) *Orchids Of Britain and Ireland – A Field And Site Guide.* A & C Black, London.

Maschinski, J. & Albrecht, M.A. (2017) Centre for Plant Conservation best practice guidelines for the reintroduction of rare plants. *Plant Diversity* 39: 390-395.

McClung, R.C. (2006) Plant circadian rhythms. *Plant Cell* 18: 782-803.

Rasmussen, H.N. (1995) *Terrestrial Orchids, From Seed To Mycotrophic Plant.* Cambridge University Press, Cambridge.

Parmesan, C. *et al*. (1999) Poleward shift in geographical ranges of butterfly species associated with regional warming. *Nature* 399: 579-583.

Stinchcombe, J.R. *et al*. (2005) Vernalization sensitivity in *Arabidopsis thaliana* (Brassicaceae): the effect of latitude and FLC variation. *American Journal of Botany* 92: 1701-1707.

Trudgill, D. (2017) Impact of climate change on potential *Ophrys apifera* (Bee Orchid) distribution. *BSBI News* 136: 31-34.

Vogt-Shilb, H. *et al*. (2015) Recent declines and range changes of orchids in Western Europe. *Biological Conservation* 190: 133-141.

Wollenberg, A.C. & Amasino, R.M. (2012) Natural variation in the temperature range permissive for vernalization in accessions of *Arabidopsis thaliana*. *Plant Cell & Environment* 35: 2181-2191.

False Pugley's Marsh-orchid
Richard Bateman

My recent article in *JHOS* on *Dactylorhiza* systematics (Bateman 2019) focused primarily on explaining how recent advances in next-generation DNA sequencing had clarified our understanding of the evolution of the genus in western Europe (Brandrud *et al*. 2019). Consequently, I dipped into specific taxonomic considerations only when attempting to refute recent attempts to resurrect the Hebridean Marsh-orchid – a greatly over-inflated taxon that, in 2006, I so foolishly suggested could merit the exalted status of full species despite its extreme rarity. However, this is not the issue that has sparked such a vibrant and intriguing debate on the HOS Discussion Forum this month (June 2020). That debate has instead focused on other aspects of the narrow-leaved marsh-orchids – more specifically, questioning the most appropriate taxonomic status for *D. praetermissa* subsp. *schoenophila* (which might usefully be named False Pugsley's Marsh-orchid!) and how best to distinguish it from genuine Pugsley's Marsh-orchid, *D. traunsteinerioides*. Given my parental responsibility for having circumscribed and named *schoenophila* (Bateman & Denholm 2012), I think it only right that I now attempt to explain the observations and thoughts that caused it to be singled out from the recalcitrant crowd of infuriatingly subtle morphological variants that together constitute that most Gordian of Knots, the tetraploid marsh-orchids.

Background

The active part of the story began in June 2005, when I guided Mikael Hedrén and Sofie Nordström – two colleagues from the University of Lund, Sweden – on a madcap, week-long tour that encompassed most of England. We were in search of tetraploid marsh-orchids to study and sample; my colleagues collected DNA material while I feverishly accumulated data from the same plants using the 52 morphometric characters established for the genus two decades earlier by Bateman & Denholm (1983). The pace of the tour meant that I was rarely able to meet my usual target of measuring ten plants per population; only on the final afternoon did the pace slacken, allowing my Swedish colleagues to visit the Eagle – the Cambridge pub where, in 1953, Francis Crick famously announced to a somewhat underwhelmed clientele that he and James Watson had discovered "the secret of life" (more precisely, the molecular structure and function of DNA).

Although the aim of our tour was to obtain a good representative sample of English dactylorchids, we especially targeted populations that had, with varying degrees of confidence, been attributed to Pugsley's Marsh-orchid, *D. traunsteinerioides*. We awarded this species star billing because it appeared to cause so many ongoing difficulties of identification and thus of botanical mapping. Distribution maps of the day showed an improbably sporadic distribution of the species across the whole

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of the British Isles, with concentrations mapped in parts of Ireland, North Wales, East Anglia, North Yorkshire and, more recently, the western seaboard of Scotland. Almost every aspect of these populations had been repeatedly questioned throughout the 20th century so it seemed a good idea to celebrate the beginning of the 21st century by attempting to solve at least some parts of this long-running puzzle.

Integrating these data with further populations from throughout the British Isles meant that our work was not published for a further six years (Hedrén, Nordström & Bateman 2011), and even then, the DNA work was unaccompanied by the parallel morphometric work. Anyone reading the paper should be aware that the senior author of the research paper was Scandinavian so, to the detriment of my blood pressure, names that predominate in Scandinavia also predominated in the paper; thus, *D. fuchsii* became *D. maculata* subsp. *fuchsii*, and *praetermissa*, *traunsteinerioides, purpurella* and *kerryensis* (still operating under its former name of *occidentalis*) were treated as subspecies of *D. majalis*. Sadly, similar taxonomic decisions were also taken more recently by Kühn *et al*. (2019), who were then obliged by the rules of nomenclature (not to be confused with genuine science) to not only return *D. kerryensis* to *D. majalis* subsp. *occidentalis* but also to rename *D. praetermissa* as *D. majalis* subsp. *integrata* (don't you just love nomenclature?!). Also, the much-discussed *"ebudensis"* was still at that time treated by us as a fifth subspecies of *D. majalis*. The DNA data published by us in 2011 were typical of that technological period: 13 markers to characterise the plastids, and from the nucleus both the (justly) ever-popular nrITS and five nuclear microsatellite loci. We presented results for 15 English dactylorchid populations and remarkably, no less than eight of those populations failed to meet my prior expectations. In a salutary warning to my belief that I could identify even notoriously difficult dactylorchids by their appearance, the dactylorchid population occupying the Lancashire dune-slacks around Southport, which I regarded as a population dominated by *D. purpurella* with subsidiary *D. praetermissa*, proved to be the converse. However, the remaining problematic populations threw down a rather more substantial gauntlet.

Plastid genomes – increasingly recognised as being unreliable for circumscribing species due to "plastid capture" during hybridisation – proved unable to distinguish between *praetermissa* and *traunsteinerioides* (Figs. 1–7). But all seven of the questionable *D. traunsteinerioides* populations from southern and eastern England proved to clearly possess nuclear genomes that were instead typical of *D. praetermissa* (Figs. 8–14). These seven problematic sites, all of which occurred

Figs. 1–7: *Dactylorhiza traunsteinerioides traunsteinerioides* (1–4) and *D. traunsteinerioides francis-drucei* (5–7). 1 and 2, West Yorkshire; 3, North Yorkshire, 4, Anglesey; 5 and 6, Wester Ross; 7, Co. Antrim.
Photos by Richard Bateman.


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south of a line drawn from the Bristol Channel to the Humber Estuary, included the majority of those cited in the recent HOS Discussion Forum debate: Mapledurwell Fen (Hampshire), Cothill Fen and Dry Sandford Pit (Oxfordshire: Figs. 10–12), and four populations in the supposed heartland of southern *"traunsteinerioides"* in East Anglia – Chippenham Fen (Cambridgeshire), Market Weston Fen (Suffolk: Figs. 13, 14), and Foulden Common and Beeston Common (Norfolk). These plants typically occurred as compact populations surrounded by larger numbers of more typical *D. praetermissa*, but like genuine *D. traunsteinerioides*, these narrow-leaved marsh-orchids occupied distinctive habitats favoured by the sedge *Schoenus nigricans*.

In the light of these results, I immediately wrote for the Botanical Society of Britain and Ireland a more personal and digestible account of how this research impacted on my perception of narrow-leaved marsh-orchids, arguing that "the temptation is to describe these plants [formerly ascribed to *D. traunsteinerioides*] as a novel subspecies or perhaps variety of *D. praetermissa* that can be broadly characterised as morphologically anorexic" (Bateman 2011, p. 12). A year later, I once again teamed up with Ian Denholm in order yield to that temptation. As part of a wholesale taxonomic restructuring of the marsh-orchids in general and the narrow-leaved marsh-orchids in particular (Bateman & Denholm 2012, pp. 45–48), we formally described the contentious southern populations previously ascribed to *D. traunsteinerioides* as a new subspecies (Box 1), *D. praetermissa* subsp. *schoenophila*, simultaneously establishing Cothill Fen as its type locality (Figs. 10, 12).

Issues raised on the Discussion Forum

The stimulating Discussion Forum debate of June 2020 raised several pertinent issues that merit serious consideration. Having understandably accepted that pocket DNA sequencers remain in the realm of science fiction, several participants expressed a desire for effective morphological characters to distinguish among *D. praetermissa* s.s. (Figs. 8, 9), *D. praetermissa schoenophila* (Figs. 10–14) and *D. traunsteinerioides* (Figs. 1–7), eliciting a promise of a forthcoming publication featuring a suite of characters that presumably improve upon those offered by us in 2012 (Box 1) as they have proven a "100% success rate." A related debating point was whether these subtly different morphologies allow individual plants to be identified with confidence, or whether field identification is more safely conducted by surveying populations. One experienced dactylorchidologist (a rarefied profession!) showed a preference for regarding *schoenophila* as a variety rather than a subspecies, and suggested that artificial crosses with mainstream *praetermissa* might prove instructive. Other

Figs. 8–14: *Dactylorhiza praetermissa praetermissa* (8, 9) and *D. praetermissa schoenophila* (10–14). 8 and 9, Hertfordshire; 10–12, Oxfordshire (10 and 12 from the type locality); 13 and 14, Norfolk.

Photos by Richard Bateman except (10) by the late Derek Turner Ettlinger.

commentators questioned whether *schoenophila* – described a mere eight years ago – had yet performed adequately within the court of public opinion to be regarded as an acceptable taxon.

The particular habitat preferences and botanical associates of *D. traunsteinerioides* and *D. praetermissa schoenophila* came under scrutiny, one observer correctly commenting that knowledge of topography and geology are extremely useful in discovering new populations of *D. traunsteinerioides*. Both taxa are almost ubiquitously associated with the Black Bog-rush, *Schoenus nigricans*, raising the pertinent question of whether *schoenophila* can be considered to be present if Black Bog-rush is absent. Perhaps most interesting of all, several localities for *schoenophila*, including the type locality at Cothill, were discussed in terms of the possibility that genuine *D. traunsteinerioides* had once occurred there but had since been "hybridised out" by the surrounding legions of *D. praetermissa*. One commentator expressed a willingness to abandon to *D. praetermissa* the Oxfordshire and Hampshire populations of *schoenophila* to their ignominious fate but circled his wagons around certain unspecified East Anglian populations reputedly resembling *D. traunsteinerioides*, arguing that "not all populations in East Anglia were sampled" during our scientific investigations. Another contributor raised the issue of a Norfolk locality – Booton Common – where the *schoenophila* plants do not appear to be guarded by plants more typical of *D. praetermissa*.

Next steps?

My main motivation in establishing subsp. *schoenophila* was not to formally recognise a new taxon; as readers will already know, I believe that this is done far too often and usually for far too little reason (Bateman 2009). Rather, I wished to emphasise the conclusion, drawn from large volumes of both DNA and morphometric evidence by Hedrén *et al*. (2011), that *D. traunsteinerioides* does not occur in southern or eastern England. Ian Denholm and I "acknowledge[d] that a valid case could be made for recognising *schoenophila* as a variety rather than a subspecies." We "emphasise[d] that the following descriptions of *D. praetermissa* ssp. *praetermissa* and ssp. *schoenophila*, and our use of subspecific rather than varietal rank, are provisional. The descriptions are not (yet) the result of a taxonomically comprehensive multivariate re-analysis of the morphology of British and Irish dactylorchid populations" (Bateman & Denholm 2012, p. 46).

This situation remains very much the case in 2020. Through the last 40 years, Ian and I have gradually amassed a morphometric database that includes 20 populations of *D. praetermissa* and 26 populations of *D. traunsteinerioides*. Nine of the *praetermissa* populations measured by us, which include Max Bog in Somerset and Scarning Fen in Norfolk in addition to those populations studied molecularly by Hedrén *et al*. (2011), contain at least a majority of plants ascribable to *schoenophila*. When eventually synthesised through multivariate analysis (no doubt after measuring the population at Booton Common!), these data should deliver the desired definitive set of distinguishing characteristics, both between *D. praetermissa* s.l. and *D. traunsteinerioides* and also between *praetermissa* s.s. and *schoenophila*. In the interim, our formal description of 2012 vintage should prove helpful, as it drew heavily on these unpublished data. But, in the absence of equivalent DNA data obtained from each plant whose morphology has been studied, it is of course impossible to state what the success rate of the supposedly diagnostic characters might be. The only certainty is that hybridisation alone will ensure that a success rate even vaguely approaching 100% is unattainable.

From a DNA perspective, the ideal next step would be to re-analyse the DNA of these plants using the next-generation technique RAD-seq, which yields several orders of magnitude more data. This approach has been applied in the Vienna laboratory of Ovidiu Paun to the *D. traunsteineri* group and, to a lesser degree, to *D. praetermissa*, thereby confirming that *D. praetermissa* had a separate and earlier evolutionary origin than *D. traunsteinerioides* (Brandrud *et al*. 2020). Adding this more recent knowledge to the suggestion by Hedrén *et al*. (2011) that both species invaded the post-glacial British Isles from the south, *D. traunsteinerioides* arriving before the less cold-tolerant *D. praetermissa*, brings some credibility to the idea that vestiges of former populations of *D. traunsteinerioides* might have persisted south of the glacial maximum.

But unfortunately, RAD-seq has not yet been applied to *schoenophila*, which is understandably viewed by my continental colleagues as posing a rather low-level and parochially British problem. The existing DNA data leave no room for doubt that *schoenophila* is attributable to *D. praetermissa*, but they are not sufficiently sophisticated to detect within *schoenophila* any small residual genetic components that might be attributable to “hybridised out” populations formerly dominated by *D. traunsteinerioides* (analogous to neanderthal genes detected in most modern humans). If analysed with sufficient sophistication to address this question directly, it is possible that RAD-seq and similar techniques might yield a credible answer. But I believe that we can already successfully address this question from first principles.

Firstly, both genetic analyses and breeding experiments tell us that, although there is rarely a perfect arithmetic relationship between the percentage of genes inherited by an orchid from a parent and the degree to which it resembles in appearance that parent, there is nonetheless a positive correlation. Small remaining amounts of genetic material would not influence the appearance of a plant of one species of dactylorchid to make it more closely resemble another species. And even if a few residual genes actually did still influence the appearance of the plant, wouldn’t we nonetheless attribute the plant to *D. praetermissa* on the basis of the genetic evidence? After all, few of us refer to ourselves as neanderthals simply because we have 1% neanderthal genes and nostrils slightly wider than the norm. Secondly, given that nuclear genes, nuclear ITS and plastids all evolve in contrasting ways, at least one of these three sources of data would be expected to show at least some evidence of past populations of *D. traunsteinerioides* in at least some study populations. Thirdly, is it likely that so many populations of *schoenophila*, scattered as they are across southern England, would have reached a similar stage of introgression between *praetermissa* and *traunsteinerioides* at a similar point in time? And fourthly, the flow of genes would have been required to be one-way, from *D. praetermissa* to *D. traunsteinerioides*, otherwise *traunsteinerioides* genes should also have spread outward to impact on the *praetermissa* plants that dwell beyond the cordon surrounding the relevant population of Black Bog-rush. There may be an orchidological equivalent of Conan Doyle's Lost World lurking somewhere within the East Anglian fens – one that I and my colleagues failed to sample – where *D. traunsteineriodes* still holds sway. But somehow I doubt it.

A more relevant question is the potential contribution of soils and other environmental factors to the somewhat *traunsteinerioides*-like appearance of the *schoenophila* plants. Yes, of course *schoenophila* could in theory occur outside the habitat range accessible to the Black Bog-rush, but it is intriguing that in practice it rarely does so. Could the subtle differences between *schoenophila* and 'normal' *praetermissa* be ascribable not to consistent genetic differences worthy of a subspecies but rather to non-genetic influences on the plants' appearance of their internal and external environments (termed respectively epigenetic and ecophenotypic factors)? If so, there is no doubt that those observers arguing that *schoenophila* merits varietal rather than subspecific status – an opinion that I am increasingly inclined to share – would certainly be justified. It is true that some useful information addressing this question could be obtained by artificially hybridising *schoenophila* with standard *praetermissa*, but an even better approach would be to mutually translocate plants of both morphologies into their respective habitats and/or to grow plants of both morphologies in identical conditions. Begun by Paun *et al*. (2010), such experiments performed on dactylorchids in Kew and latterly Vienna included *D. traunsteinerioides* but, regrettably, *D. praetermissa* was replaced by its close relative *D. majalis* s.s.

Addressing the issue of whether or not *schoenophila* has achieved widespread acceptance, I freely admit that I would prefer the credibility and optimal rank of *schoenophila* to be judged solely on its scientific merits. In the political realm at least, consulting the court of public opinion has not yielded particularly impressive results in recent years. For those who commented on the Discussion Forum that they would like to examine that scientific evidence for themselves but have not been able to do so, I would remind readers that most of the relevant literature, including my own publications, can be freely obtained through online sources such as Google

Scholar (or, if you yourself are a published author, through the more professional ResearchGate). One comment I can safely make is that the forthcoming national plant atlas to be produced by the Botanical Society of Britain and Ireland is unlikely to feature records of *D. traunsteinerioides* located in East Anglia (Fig. 15).

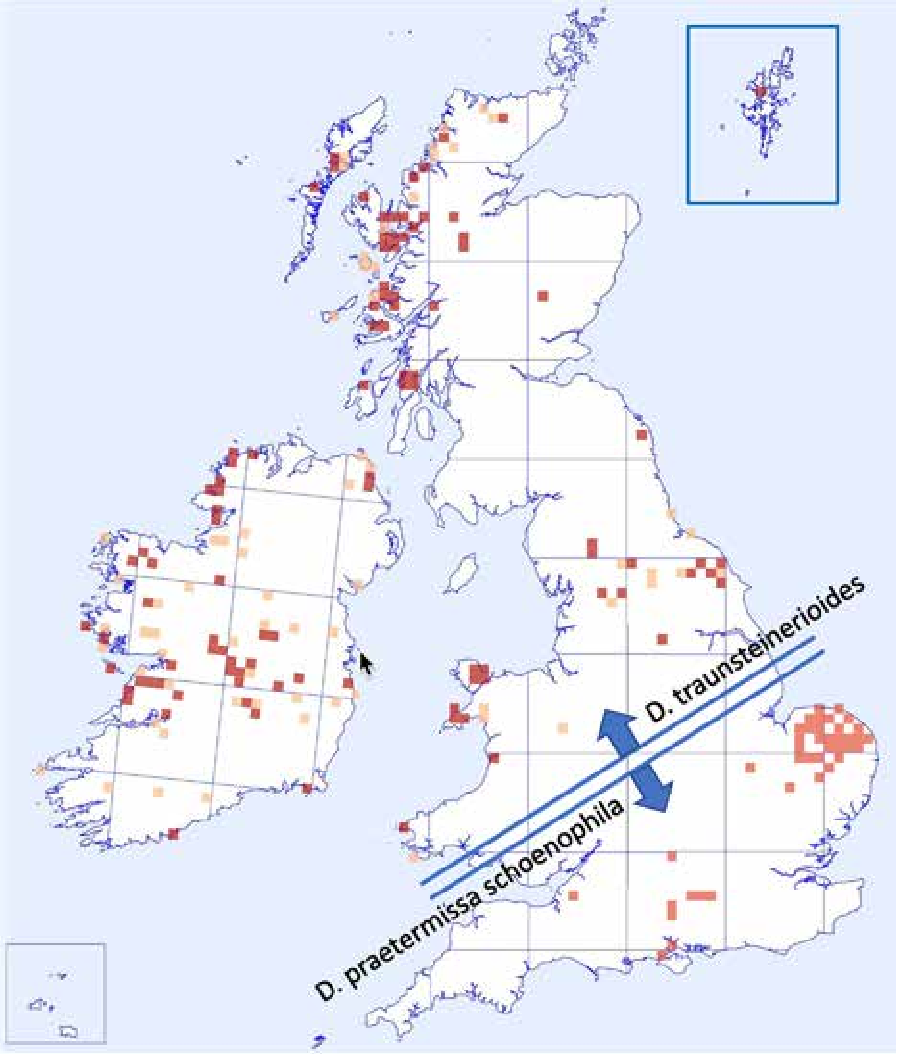

Fig. 15: Maps of the distributions of *Dactylorhiza traunsteinerioides* s.l. and *D. praetermissa schoenophila*, as downloaded by the author in June 2020 from the Distribution Database of the Botanical Society of Britain and Ireland. It is presently a moot point whether *schoenophila* occurs north of the ‘Great Divide’.

Which takes me on to consider the final issue explored on the HOS Discussion Forum: whether native dactylorchids should be examined primarily as assemblages of individual plants or more holistically as populations. As the more experienced among the commentators already noted, it is essential that we favour holism. Even compendia of images such as those presented here as Figures 1-14 are inadequate to capture the variation shown by any particular dactylorchid taxon, particularly as so few photographers capture images at a consistent scale. The morphological and genetic complexity that constitutes the dactylorchids is primarily the result of the closeness of their relationships, which assists their extreme (yet intricate) promiscuity. Shameful behaviour that we humans have tacitly endorsed by encouraging taxa with different habitat preferences to interbreed – taxa that presumably rarely met until we wrought such profound upheavals on the landscape. It became inevitable that the dactylorchids would persistently challenge our deeply ingrained sense of order; even after 40 years of study, I still cannot decide whether I love or hate them.

Box 1: Protologue (original description) of *D. praetermissa* subsp. *schoenophila.* (Key: rarely = <20% of plants, occasionally =20–50%, often = 50–80%, usually = >80%)

Subsp. *schoenophila* R.M. Bateman & Denholm, subsp. nov.
Stem rarely exceeds 30 cm tall, *rarely exceeds 5 mm in diameter*. *Sheathing leaves rarely 4 or more*, *usually moderately hooded*; longest leaf occasionally exceeds 12 cm in length, *rarely exceeds 2 cm in width*, *occasionally placed above widest leaf* (longest often = widest); non-sheathing leaves occasionally 2 or more; basal leaf/sheath occasionally present. Inflorescence occasionally exceeds 18 flowers (comparatively sparse). Bracts usually contain diffuse anthocyanins; cells along bract margin occasionally exceed 80 µm in length. *Labellum rarely more-or-less flat* (lateral lobes typically moderately to strongly recurved), lateral lobes occasionally indented; lateral sepals often near-vertical, occasionally marked with solid spots. Flowers mid-May to mid-June. Occasional in East Anglia, very local in southern England and possibly also the Low Countries; usually forms small populations

References

Bateman, R.M. (2009) What's in a name? *JHOS* 6(2): 53–63, 6(3): 88–99.

Bateman, R.M. (2011) Glacial progress: do we finally understand the narrow-leaved marsh-orchids? *New Journal of Botany* 1: 2–15.

Bateman, R.M. (2019) Next-generation dactylorchids. *JHOS* 16(4): 114–128.

Bateman, R.M. & Denholm, I. (2012) Taxonomic reassessment of the British and Irish tetraploid marsh-orchids. *New Journal of Botany* 2: 37–55.

Brandrud, M.K., Baar, J., Lorenzo, M.T., Athanasiadis, A., Bateman, R.M., Chase, M.W., Hedrén, M. & Paun, O. (2020) Phylogenomic relationships of diploids and the origins of allotetraploids in *Dactylorhiza* (Orchidaceae): RADseq data track reticulate evolution. *Systematic Biology* 69: 91–109.

Hedrén, M., Nordström, S. & Bateman, R.M. (2011) Plastid and nuclear DNA marker data support the recognition of four tetraploid marsh orchids (*Dactylorhiza majalis s.l.*, Orchidaceae) in Britain and Ireland. *Biological Journal of the Linnean Society* 104: 107–128.

Kühn, R., Pedersen, H. & Cribb, P. (2019) *Field guide to the orchids of Europe and the Mediterranean.* Kew Publishing, London.

Paun, O., Bateman, R.M., Fay, M.F., Hedrén, M., Civeyrel, L. & Chase, M.W. (2010) Stable epigenetic effects impact evolution and adaptation in allopolyploid orchids. *Molecular Biology and Evolution* 27: 2465–2473.

Photographic Competition 2020

This year we will not be displaying the prints at Kidlington, even if the meeting does go ahead, due to the restrictions about social distancing that are in place and having to forward plan. All print entries will need to be with Neil Evans by the 2nd October 2020, Neil's address is in the Journal. If you wish the return of your prints then please enclose an SAE. Neil will also require a digital copy of the print emailed to, neilevans@hardyorchidsociety.org, by the 3rd October 2020. Please name the file in the following format Your name, Class entered in, Orchid name, Location, e.g. Neil Evans, Class 12, Ophrys apifera, Sussex.

Digital Entries need to be emailed to Neil by the 3rd October 2020 with the filename in the same format as above.

All entries will be made into a PowerPoint presentation for display on the forum along with a presentation of the winning entries with comments by the judge.

Video Competition 2020

As the Leeds meeting has been cancelled the video competition will be held online. All entries need to be with Steve Pickersgill by the 12th August 2020, either by email hosvc@hardyorchidsociety.org or for larger files, using one of the free transfer services such as WeTransfer or Dropbox. Videos will be posted on the website for one week, starting 5th September and members will be able to vote for their favourite video via a poll on the Forum. The poll will open on the 5th September and close on the 12th September. If you are an HOS member but not yet a Forum member, email Moira Tarrant, our Membership Secretary, at moira.tarrant@outlook.com for an invitation to join. Please note that for both members of a Joint membership to vote both members must register for the Forum individually.

A Strange Mutant *Anacamptis pyramidalis* (Orchidaceae)

Phillip Cribb and Peter Sander

Anacamptis pyramidalis, the pyramidal orchid, is a common orchid in Europe and readily recognised by its almost pyramidal head of small bright pink-purple flowers with a trilobed lip bearing a slender nectariferous spur and two small oblong fleshy calli at the mouth of the spur. In Britain, it is relatively uniform with brightly coloured inflorescences that begin to appear in mid to late June but can often still be found into early August. It can be found in a wide range of habitats, favouring chalk and limestone grassland but equally happy in dune slacks and disturbed places such as roadside verges and old gravel diggings. In continental Europe, it can produce larger inflorescences than are usually seen here, while in the Mediterranean, plants with paler pink or even white flowers are much commoner and usually predominate.

Peter and Marianne Sander, visiting the golf course at Sandwich to see the Lizard Orchid (*Himantoglossum hircinum*) in early June, came across a strange plant with two flowering spikes that defied identification in the field guide that they checked. Peter sent photographs of it to PC but confident identification proved impossible. A second visit to the site a week later by both of us produced a surprising result. Growing in sand near Lizard and Pyramidal Orchids, both in flower, the strange plant was indeed an orchid and seemed to us to be a fasciated form of the Pyramidal Orchid. Each flower was replaced by a short inflorescence of regular, rather than zygomorphic, pink flowers in which the six perianth segments were all petaloid. Overall, the inflorescences of the two flowering stems resembled those of a valerian rather than of an orchid. However, the habit and foliage left no doubt that it was orchidaceous.

We sent photographs to Richard Bateman and Paula Rudall who explained that this is not a fasciation as we had suspected. The definition of fasciation, as they reminded us, ‘is a relatively rare condition of abnormal growth in vascular plants in which the apical meristem (growing tip), which normally is concentrated around a single point and produces approximately cylindrical tissue, instead becomes elongated perpendicularly to the direction of growth, thus producing flattened, ribbon-like, crested (or “cristate”), or elaborately contorted, tissue.

Figs. 1 & 2: Mutant form of *Anacamptis pyramidalis* with a developmental defect from Sandwich, Kent.
Fig. 3: Pinkish white *Anacamptis pyramidalis* from the Mani, Greece.
Fig. 4: (& back cover): The normal purple form of *Anacamptis pyramidalis* from the southern Alsace in France.
Photos by Phillip Cribb

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They continued 'What has happened with your plant is that development has in effect tripped up by one step, such that where it should be producing a flower subtended by a bract via a determinate meristem it is instead producing a subsidiary inflorescence via an indeterminate meristem. Only then does it produce its circular (not elongate) clusters of ca 10 mutant flowers. Quite remarkable, and really quite special, but certainly not fasciated.'

The only other orchid nearby that could be considered was Southern Marsh-orchid (*Dactylorhiza majalis* subsp. *integrata* or *D. praetermissa* whichever you prefer), but the size of the floral segements and the dry habitat where the strange orchid grows, suggest that our first guess as to its identity is correct

Acknowledgements
We would like to thank our wives whose sharp eyes often put us to shame when orchid-hunting. Richard Bateman and Paula Rudall generously looked at our photographs and provided their expert opinion on what we had found and we are most grateful for their help.

Orchid Hunting in Sardinia
Jenny Willsher

I first went to Sardinia in 2004 with a group of naturalists as an amateur and mostly self taught botanist. I have been back several times since but the prescribed itinerary has meant the orchid sightings have been restricted to a limited number of sites, and there were birds, butterflies and archeology to look at as well! But that said, each trip produced an orchid tally of 25-30 species.

The timing of these trips was always at the end of April and into the beginning of May. Sardinia provides many verdant landscapes at this time of the year and has many unique archaeological sites too. I will describe the areas I am familiar with from my regular visits but as with any area there will be many other sites to discover and explore. The week long trips would be split between two bases – one south of Cagliari, near Pula, and one in Dorgali, near the east coast and on the edge of the sprawling Gennargentu National Park. My reference book was Delforge (2006)

Starting in the south, an exploration of some habitat around the saline lagoons near Cagliari, produced good spikes of *Ophrys apifera, Ophrys neglecta*, one of the *tenthredinifera* group that Delforge has split and describes very clearly for this

Fig. 1: *Ophrys neglecta* Fig. 2: *Serapias cordigera*
Fig. 3: *Serapias lingua* Fig. 4: *Ophrys normanii*
Photos by Jenny Willsher

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part of Sardinia (Fig. 1) and *Anacamptis laxiflora.* On one of the earlier trips, when access to a target birdwatching site proved difficult, we decided to explore the Valle D'Oridda in the Forest of Margani, just north of the town of Domusnovas. This was recommended by the ranger at the WWF reserve at Monte Arcosu and it proved to be a very orchidaceous place. On our way there, at a road junction where there was a grassy triangle, we found some stunning clumps of *Serapias cordigera* (Fig. 2), plus a few spikes of *Serapias parviflora* and *Serapias lingua* (Fig. 3). The next year I visited and, to my horror, the whole area had been strimmed by grasscutters! At the third visit we arrived just as the roadmen had started clearing the area. My grasp of the Italian language did not run to asking them not to shave off the flowers but they paused, and watched with some amusement, while we took photos! These orchids are frequently found on roadsides so must be a hardy group!

So, on to the orchid valley! The first orchids were *Orchis anthropophora,* in numbers, with a few spikes of *Neotinea maculata.* Then *S. lingua, S. parviflora* and their hybrid, one spike of *Ophrys normanii* (Fig. 4), an endemic of SW Sardinia with its large lip, *Ophrys morisii* and *Ophrys aprilia,* both Sardo-Corsican endemics. But the orchid that stole the show was the many spikes of *Ophrys chestermanii* (Fig. 5) with its square chocolate brown lip. Higher up the valley were *Ophrys fusca, Orchis ichnusae* (Fig. 6)*, Orchis provincialis, Himantoglossum robertianum* and, in the woods *Limodorum abortivum* and *Epipactis microphyllum.* In many places along the roadsides would be clumps of *Orchis papilionacea* in many colour variations. A brief exploration of the Sinis Peninsular on the west coast added *Ophrys speculum, Ophrys phryganae a*nd *Ophrys eleonora* (named after the Sardinian princess of the same name) to the list. This latter *Ophrys* I always think of as the Western equivalent of *Ophrys iricolor* which I have seen many times in Crete and Chios.

From Dorgali some of the most productive sites were the roadsides down to Cala Gonone where I once found *Orchis brancifortii,* and various *Ophrys* such as *O. lutea* and *O. incubacea* (*sphegodes*) (Fig. 7)*, Cephalanthera longifolia* and *Epipactis helleborine.* The other productive area is the huge sprawl of the Gennargentu National Park. Roadside communities include *Anacamptis longicornu* (Figs. 8 & 9)*, O. papilionacea*, *O. papilionacea* × *longicornu*, possibly *Neotinea conica* (I have only ever seen this once but it might have been a pale *N. tridentata*), *Neotinea lactea,* large numbers of both *Orchis provincialis* (Fig. 10) and *Dactylorhiza insularis* (Fig. 11), *Ophrys bombyliflora, O. scolopax* subsp. *conradiae* and various hybrids. The flora on the road up to Bruncu Spina is rich in many other lovely plants such as the endemic *Paeonia mascula* subsp. *russoi* (Fig. 12), the endemic *Crocus minimus*,

Fig. 5: *Ophrys chestermanii* Fig. 6: *Orchis ichnusae*
Fig. 7: *Ophrys incubacea* Fig. 8: *Anacamptis longicornu*
Photos by Jenny Willsher

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Saxifraga corsica, *Viola corsica,* many cistus, lavendas, vetches and the handsome umbellifers *Ferula communis* and *Magdyris pastinacea*, a statuesque, hoary endemic.

I do hope to return to Sardinia with the luxury of focusing on the plants, as there is so much more to explore and more orchids to find such as the endemics *Serapias nurrica, Ophrys ortuabis, Ophrys zonata, Ophrys annae, Ophrys panattensis* and others such as *Ophrys picta, Platanthera algeriensis.* Also it would be good to revisit and take better photos of some of the many *Ophrys* species.

Fig. 9: *Anacamptis longicornu*
Fig. 10: *Orchis provincialis*
Fig. 11: *Dactylorhiza insularis*
Fig. 12: *Paeonia mascula* subsp. *russoi*
Photos by Jenny Willsher

Informative Photographic Display

The HOS Informative Photographic Display is held each year at the Autumn Southern Meeting and is non-competitive.

- The purpose of this event is for members to share their gems of information, gleaned or identified, about the fascinating world of orchids and their biology.
- Contributions will be displayed on boards so they can be viewed throughout the day.
- Displays may be up to A2 in size. Ideally they should be mounted on a backing board for easy display but this is not a requirement.
- Members may bring more than one display.
- Displays should include the name (s) of the members providing it.
- Each display should consist of one or more images and a description or explanation of these. The text should be large enough for people to read easily but the area of text should not dominate the display.
- Examples of suitable images may include but are not restricted to:
    An ultra-close image showing features not readily seen by the human eye
    A pollinator visiting a flower
    A predator consuming a pollinator
    A herbivore consuming a plant
    Mycorrhizal fungi infecting orchid roots
    Seeds and seedlings; germinating seeds, pollen
    Anatomical sections

Please let Neil Evans know by 1st November 2020, how many contributions you intend to bring. If you wish to contribute to the show but are unable to attend the meeting at Kidlington please contact Neil Evans to discuss ways of getting your contribution to the meeting.

Anthocyanin rich *Dactylorhiza maculata*
From the HOS Forum

Another recent and interesting discussion from the HOS Forum featured this anthocyanin rich *Dactylorhiza* specimen. It was found by Elliott Hails on Dartmoor and rephotographed by Bryan Knox a few days later. The consensus formed after a lively debate was that this is a variety of *Dactylorhiza maculata* rather than the more familiar *rhodochila* variety of Common Spotted-orchid. Some commented that it appears like the variety *concolor* described by Anne and Simon Harrap in their classic orchid book as 'extremely rare, with just one or two records'.

Simon Melville credits Rosemary Webb as the source of another similar plant found on Southampton Common that was photographed both by Simon and Bryan Knox. Elliott's photograph of the Dartmoor plant (top) is included here together with Simon's photograph of the Southampton Common plant (bottom). The latter is also featured as the cover image for this *JHOS*. Although not apparent in these photographs the leaves of the Dartmoor plant were also spotted, albeit rather lightly pigmented compared to the plant's flowers.

Anthocyanin rich *Dactylorhiza maculata* plants from Darmoor (top) and Southampton Common. Photos by Elliott Hails and Simon Melville respectively.