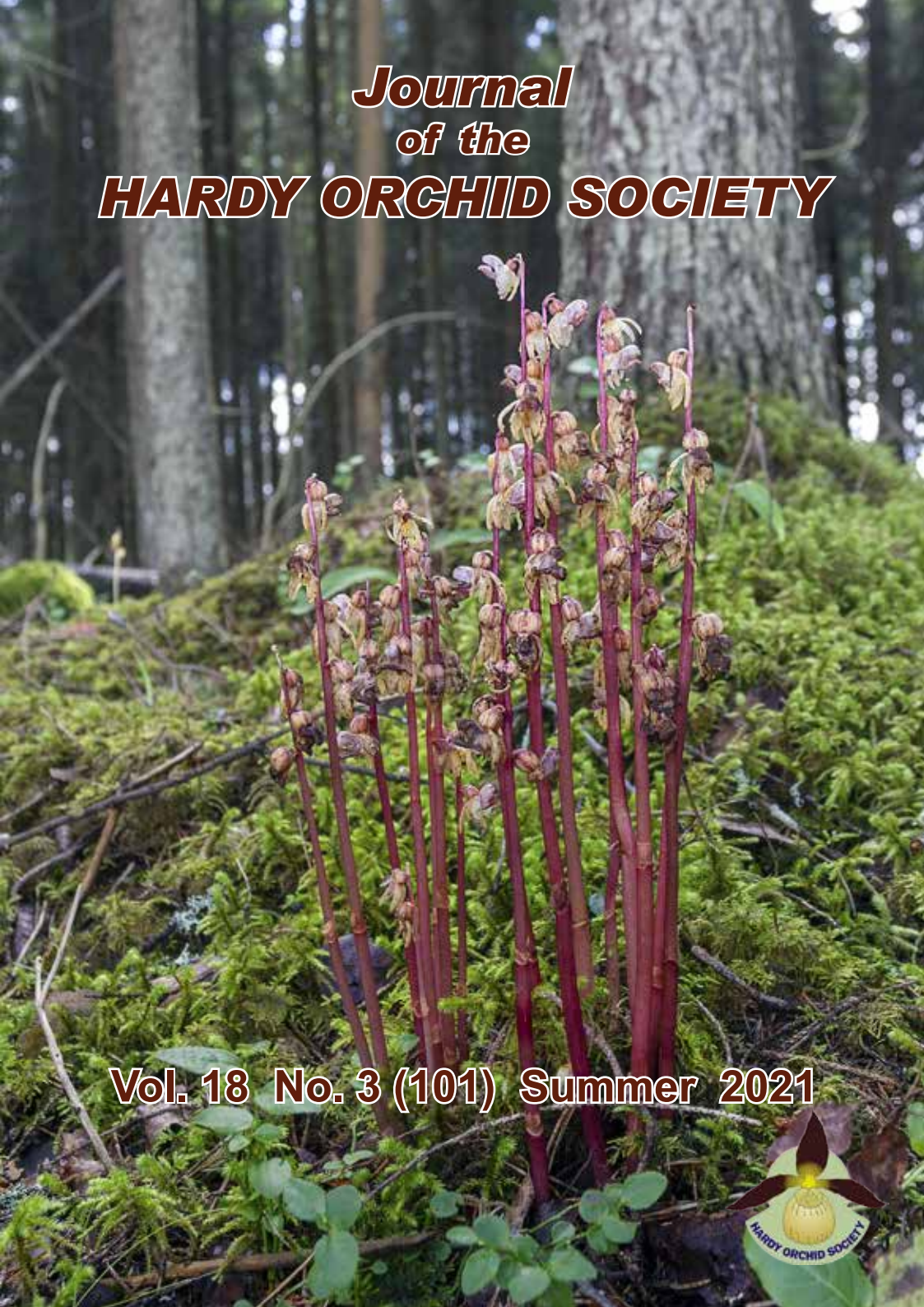

Journal of the HARDY ORCHID SOCIETY

Vol. 18 No. 3 (101) Summer 2021

The Hardy Orchid Society Committee

Front & Back Cover Photographs

Ghost Orchids in Estonia photographed by Rainar Kurbel – *Epipogium aphyllum* forma *rosea* on the front cover and a Ghost Orchid surviving in the snow on the back cover. See the article on page 80.

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.

Contents

Editorial Note

Mike Gasson

We do not often have a *JHOS* dominated by one article but this time we do. Rainar Kurbel's account of the Ghost Orchid in his native Estonia, with a super selection of his photographs and some original observations, really did warrant its dominance of this Summer issue. I hope you enjoy seeing this rare orchid in a less well-known area and in such detail. Elsewhere, we have results from the 2021 Plant Show, and articles on *Epipactis* and anthocyanin-rich *Dactylorhiza.*

At present we have a strong pool of submitted articles so are hoping to produce an extra *JHOS* issue this year. This will not be a regular change but an occasional extra to address larger volumes of Members' articles if/when that occurs. Do keep submitting material though as it is essential to the quality of the Journal.

Password for Members' Area of HOS Website: ghost2021

A Members'area will be launched soon with digital copies of recent *JHOS* issues and an archive of some online presentations from Leeds and Kidlington.

Chairman's Note
Carol Armstrong

I hope that this issue of our Journal finds you well and you are enjoying the summer orchid season. I am making the most of visiting sites of orchid interest that are local to me. It was a great pleasure to see that the HOS field trips got underway as soon as travel restrictions were eased, and many of you, no doubt, had a great day in the company of like-minded friends. I expect that the August Seed Sowing Workshop and September's Northern Indoor Meeting will run as scheduled. You will be contacted directly if there is any change in Covid guidance that causes restrictions to be re-imposed. Many of us will have an opportunity to chat in person and I look forward to the above activities going ahead in late summer/early autumn.

I want to thank the Committee Members, field trip leaders and speakers who have not only organised or contributed to these events, but have already prepared alternatives in the form of online versions should we be unable to meet and therefore have to cancel again. We have Committee Members due to retire in 2021/2022. Most of the those retiring have stayed in post an extra year as we all had to cope with last year being unlike anything that any of us had experienced – making normal personal channels of communication almost impossible. Now I want to ask if you would extend your interest in the Society to perhaps undertake a future role on the committee? If you would like to offer your help in one of the specific roles that will become vacant, (Treasurer, Plant Show Secretary, Video Competition Organiser, Projection at Sound at meetings), then let me or any other member of the Committee know. We will be happy to talk you through the role and you'd be welcome to join us as an observer at our next Committee meeting. Keep checking the website, keep yourselves safe and well.

Results of HOS Plant Show 2021

Due to Coronavirus restrictions the 2021 Plant Show was held as an online digital event with entrants submitting photographs of their plants for judging.

Class 2: Three pots native European (not native to Britain) orchids, distinct varieties.

1st Barry Tattersall: *Neotinea maculata*; *Ophrys tenthredinifera*; *Orchis pauciflora*

2nd Neil Hubbard: *Ophrys bombylifera*; *Ophrys reinholdii*; *Orchis collina*

Class 3: Three pots non-European hardy orchids, distinct varieties.
1st Barry Tattersall: *Ophrys kotschyi*; *Ophrys lapethica*; *Orchis sezikiana*

Class 4: Three pots hardy orchids, distinct varieties, any country of origin.
1st Barry Tattersall: *Neotinea lactea*; *Ophrys speculum*; *Orchis quadripunctata*
2nd Neil Hubbard: *Dactylorhiza romana*; *Himantoglossum robertianum*; *Ophrys speculum*

Class 5: One pot native British orchid.
1st Neil Hubbard: *Anacamptis morio*

Class 6: One pot native European (not native to Britain) orchid.
1st Barry Tattersall: *Orchis brancifortii*
2nd Neil Hubbard: *Himantoglossum robertianum*

Class 7: One pot non-European orchid.
1st Barry Tattersall: *Anacamptis syriaca* Best in Show
2nd Neil Hubbard: *Disa sagittalis*
3rd Nigel Denman: *Pterostylis curta*

Class 8: One pot *Dactylorhiza.*
1st Neil Hubbard: *Dactylorhiza romana*
2nd Barry Tattersall: *Dactylorhiza romana*

Class 9: One pot *Orchis*, *Anacamptis* or *Neotinea.*
1st Neil Hubbard: *Anacamptis laxiflora*

Class 10: One pot *Ophrys.*
1st Neil Hubbard: *Ophrys speculum*
2nd Barry Tattersall: *Ophrys balearica*

Winner of Best in Show Trophy:
Barry Tattersall for *Anacamptis syriaca* in Class 7

Banksian Medal

There will be a second Plant Show later in the year and the Banksian Medal for 2021 will be awarded to the entrant with the highest combined score from both shows.

Thanks to Nick Fry for judging the Plant Show

Some winning entries are displayed on the following two pages and the HOS website has photographs of all the first placed plants as well as an overview of all entries with images and the Judge's comments.
Fig. 1: Barry Tattersall's "Best in Show" *Anacamptis syriaca* from Class 7
Fig. 2: Barry Tattersall's *Orchis sezikiana* from Class 3
Fig. 3: Barry Tattersall's *Orchis pauciflora* from Class 2
Fig. 4: Barry Tattersall's *Neotinea lactea* from Class 4


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Some Remarkable Observations of the Ghost Orchid (*Epipogium aphyllum*) in Estonia

Rainar Kurbel

Unprecedented Late Flowering Period

In Estonia the Ghost Orchid *Epipogium aphyllum* is known from approximately 20 locations scattered throughout eastern and central regions, with additional occurrences on the islands of Saaremaa and Hiiumaa to the west. It typically occurs in moist *Picea abies* and *Populus tremula* forests, usually with minimal understorey, growing out of old leaf litter (Fig. 1) but sometimes on green moss (Fig. 2).

Fig. 1: *Epipogium aphyllum* growing out of old leaf litter.
Fig. 2: *Epipogium aphyllum* growing on green moss.

All Photos by Rainar Kurbel

Despite Estonia being one of the coldest countries in Europe away from Scandinavia, the usual flowering period of *Epipogium aphyllum* is similar to that in the rest of its European range, being mid July to mid August, peaking in the second half of July. There are no previous records of Ghost Orchid flowering in May, June, September or October, as with other countries in Europe. It was a great surprise, then, when on 9th October 2020 I discovered two small plants of *Epipogium aphyllum* just coming into bud among colourful autumnal leaf litter (Figs. 3 & 4). They were growing in amongst a large group of Small-leaved Lime *Tilia cordata*, surrounded by English Oak *Quercus robur*, European Ash *Fraxinus excelsior*, European Aspen *Populus tremula* and European Crab Apple *Malus sylvestris*.

The latest recorded flowering of the species in Europe is 17th October, in Oxfordshire, UK (Cole, 2014), so it was clear that these two small plants might create a new record if they were to survive the impending cold period and manage to produce flowers. This is indeed what happened, with the first flower opening on 29th October, by which date six plants had been discovered at the location (Fig. 5)!

Figs. 3 & 4: *Epipogium aphyllum* coming into bud among autumnal leaf litter.
Fig. 5: First *Epipogium aphyllum* flower opening amongst six plants.

The weather during the interim had minimum temperatures of 1-2°C at night and a maximum of 6-11°C during the daytime, with the 24h average being 6-7°C. The plants were in my experience medium-sized with up to three flowers, reaching 14cm on 29th October, with a stem diameter of 3.5mm, so were no different in size or vitality to those flowering during the usual period.

With temperatures set to drop below freezing in November, it was going to be very interesting to see how the plants fared. Of course, everything lasts longer in a freezer, and during November, temperatures dropped to zero overnight on several occasions, reaching up to 10°C during the day. This didn't affect the Ghost Orchids adversely – in fact, they continued to develop!

One of the plants, with two flowers, was measured at 15cm tall on 1st November, with the top flower still in bud, and by 7th November it was 19.3cm tall with the top bud having now opened. Another stem, with three flowers and with the top flower still in bud on 7th November, opened the third flower on 21st November (Fig. 11). In the interim, one night was -1 to -2°C followed by another at -2 to -4°C, with corresponding daytime temperatures reaching +1°C and +3°C respectively. Subsequently, the weather warmed up, but two stems survived, in flower, until the 9th December. The day before that there was a severe arctic blast (-6.5°C on the night of the 8th December) and the stems broke during the evening of the 9th December, having lost their colouration following the harsh night. This record is remarkable in a number of ways. One open flower lasted 41 days, perhaps the longest of any orchid species anywhere in Europe. The Ghost Orchid can withstand very cold temperatures when above ground, even below freezing for short periods, and a short period of snow does not adversely affect growth.

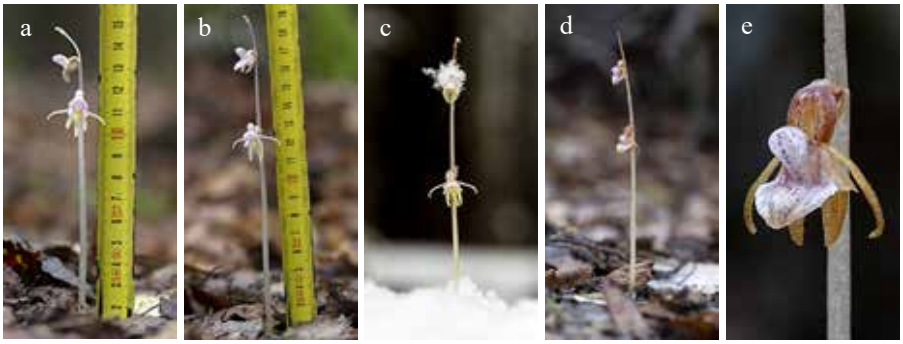

Fig. 6: Lifecycle of an individual *Epipogium aphyllum* plant.

a): First flower opened 29th October and this first photograph was taken on 1st November (height 15cm).
b): Second photograph taken on 7th November (height 19cm).
c): Third photograph with snow taken on 30th November (also on back cover).
d & e) Two photographs taken on 9th December before it fell down on 10th December.
This plant had a flowering period of 41 days and a second plant had flowers open for more than 35 days!

Slug Predation

Whilst it might have been expected that the temperatures during these plants' emergence would have prevented slug predation, this was not the case. During the early part of emergence, daytime temperatures were reaching up to 10°C and three of the six plants were eaten or broken by slugs between the end of October and mid-November, whilst still in bud. Another three-flowered plant was eaten on 3rd or 4th November. I have recorded a lot of individuals of the non-native species, *Krynickillus melanociphalus* (Fig.7 below) eating *Coprinus* species. It is rapidly expanding in this area since first reported in Estonia in 2014, as are some *Malacolimax* sp. and other smaller slug species. In fact, slug presence and activity was much greater during the period of this observation than during the more usual flowering period of *Epipogium*, in July (and August) – this was especially the case for *K. melanociphalus*.

Fig. 7a: *Krynickillus melanociphalus* eating *Coprinus* sp.
Figs. 7b - 7d: Slug damage to *Epipogium aphyllum* plants.

Underground Parts

One of the plant's stems curled back to meet the ground, forming an arc with the tip of the stem extending below the surface of the leaf litter (Fig. 8). On this plant, flowering commenced at the end of October, but the first open flower quickly fell victim to slugs.

Fig. 8: *Epipogium aphyllum* plant with curled back stem.

Having carefully removed about 6-7cm of upper litter layer in the surrounding area, in an effort to find more flowering plants, I discovered several *Epipogium* stolons with bulbils attached (Figs. 9 & 10). These were 5.4 and 6.2cm apart along the stolon, longer than the 2–3 cm mentioned in the literature (Reinke 1873; Rasmussen 1995, Yagame *et al*. 2007). The bulbil closest to the main rhizome also had smaller rhizoids on it – the very beginnings of newly-developing plants.

The stolons of *Epipogium* are very thin and delicate, breaking even with the most careful movement of the associated leaf litter, or even the slightest accidental contact.

Fig. 9: Stolon of *Epipogium aphyllum* with two bulbils.

Fig. 10: *Epipogium aphyllum* bulbil with new rhizomes.

These delicate structures are the means by which the species reproduces vegetatively, so it is not difficult to imagine the effect that even the most careful footfall will have on the spread of *Epipogium* among the soft, damp substrates in which it flourishes best. For this reason, sites for this species should not be visited repeatedly or by large numbers of people.

Mycorrhizal Hosts

Several sources (for example, Roy *et al*, 2009) quote fungi of the genus *Inocybe* as the most common mycorrhizal hosts for *Epipogium*. Interestingly, no fungi of this genus were seen in the vicinity during the entire above-ground period of this group of plants. There is the possibility that it was too late for the fruiting period and there were underground parts present, of course.

However, other fungi were present close to these plants, especially several *Coprinus* species (interestingly, this genus is cited as one of the fungal hosts of the other species in the genus, for example *Epipogium roseum*). There were also many *Tubaria furfuracea*, *Hypholoma capnoides* and a colony of *Mucilago crustacea* within a ten metre radius away from the *Epipogium* plants.

Fig. 11: *Epipogium* plants with *Coprinus* sp. very close by on 21st November

***Epipogium* Numbers at a New High Level**

In August 2020 we had the privilege to discover a huge new population of *E. aphyllum* in Estonia. I have been studying orchids in the country for approximately 30 years and this find without doubt gave me one of the biggest "wow" moments in that entire time. To qualify what might sound like an over-statement, I ask you to imagine a football pitch sized area containing exactly 2609 flowering Ghost Orchids! Just to be sure our number was accurate, Toomas Hirse and I counted carefully for exactly six hours non-stop!

In order to protect this incredible colony we will not specify the location, but it is in the eastern part of Estonia. The habitat was middle-age Spruce forest mixed with Pine and Birch. No understorey, with clear visibility through the trees for tens of metres. Nearby some forestry work had been carried out. In August it was very dry there, but under leaf litter and moss there was still some humidity. We discovered other achlorophyllous orchid species there – *Neottia nidus-avis* and *Corallorhiza trifida*, but both were massively outnumbered by *Epipogium*.

Figs. 12-15: *Epipogium* plants in probably the largest extant population in Europe.

After further visits we found additional plants in the surrounding area, bringing the total number to at least 3000, surely making this the largest extant population of *Epipogium aphyllum* in Europe.

With such a large population as this, it was an opportunity to take some measurements to test the true morphometric range of this species. The maximum number of flowers on a single stem is, from a personal trawl of numerous sources, given as eight to ten. But is this accurate? A plant with ten flowers was reported in 1982 from southwest Germany (P. Delforge, pers. com.). A search of written and electronic media (including internet and social media) has resulted in my finding no records of plants with more than seven flowers, possibly indicating that more vigorous plants were recorded at a time when the species was much more common. But never say never of course.

Fig. 16 One *Epipogium* stem with eight flowers and two stems nearby with seven flowers. Stems with diameter over 8mm are a sign of superb vitality.

It was a great thrill, then, when on 5th August 2020, we discovered a single plant with eight flowers (Fig. 16). Nearby were two plants with seven flowers and many others with five or six. It seems to be that the bigger the population, the exponentially higher the probability of finding highly vigorous plants. In Estonia at least, within smaller populations (up to 10-20 plants) even five flowers on a single stem is rare. In places with just one or two plants usually four flowers is the maximum, but more often just one or two. Width (diameter) of stem (measured at the widest point, usually just above the base) is another indicator of plant vitality. Smaller plants usually have stem widths of 1-2mm, bigger plants with four or five flowers usually 3-4mm. Stems with diameter >5mm are rare. The largest plant we measured in 2020 had a stem diameter of 8.56mm – truly remarkable for *Epipogium*!

Fruit Set and the Size of Fruits

There are many scientific works and books that mention poor or mostly non-existent fruit set of *Epipogium*. This new, large colony changed our perception of this commonly accepted belief. Fruit set rates were surprisingly high, by visual observation a minimum of 80% (Fig. 17), regardless of location within the colony, the size of plants or number of plants in a group. Given the number of flowering plants (2609), this means many thousands of seed capsules, each containing thousands of small seeds approximately 0.2-0.3mm in size. We measured some capsules and they were huge, the biggest ones up to 15mm in diameter, like small cherries!

Fig. 17 *Epipogium* plants with extensive fruit set.

Weather-related Prediction of Flowering Success

Because of the rarity of *Epipogium aphyllum*, the relevance of weather is a popular topic. Therefore, many search for some logic and try to understand how local climate affects flowering success and thereby determine if flowering is predictable. There are many well-known theories such as warmer spring, enough rainy days in spring (and/or autumn), thunderstorms prior to the flowering period, effect of snow or frost in winter. One thing on which everyone agrees, however, that if there is a long period of drought, immediately prior to the flowering period, *Epipogium* will not flower at all or numbers will be significantly below average.

For any theory to be proven, it would be essential to study multiple populations from a wide geographic spread, in various habitats, altitudes and climates, over a long period of time. In Estonia there are over ten active (i.e. flowering every year) local populations across the country, from the islands of Hiiumaa and Saaremaa off the west coast to eastern and southern areas near the Russian border. Some of them have been studied annually for over 20 years, and others for between five and 15 years. After analysing these data and personal experience it is my opinion, based on Estonian colonies, that there is no connection between climate and flowering success across different populations! Each population lives its own cycle, seemingly unconnected

to that of either neighbouring populations or others elsewhere in the country. To demonstrate this, I chose two pairs of locations close to each other, in different regions: A & B in north-east Estonia and C & D in the south-east of the country (Fig. 18). A & B have the same temperatures as each other throughout the year, the same amount of sun and clouds and the same amount of rain and humidity. The same is true for C & D (distances between these places: A-B=5km; B-C=110km; C-D=33km).

Fig. 18 Location of study sites

As can be seen from the table below, the total number of plants varies consistently with both small differences and more than a ten fold difference (2020 sites C and D). Even if a longer time period is taken into account or more locations are analysed, the result will be same – there is no correlation between populations. If going to one place, you never can predict what will be at another, even one nearby.

	2015	2016	2017	2018	2019	2020
A	19	44	81	22	13	14
B	13	61	78	51	37	37
C	12	0	3	25	6	5
D	19	25	35	17	0	57

After finding the large colony mentioned above we decided to analyse the soil to try to figure out what had created such a dense, healthy colony of *Epipogium*. We collected soil samples from that large colony and five other colonies scattered across the country. All five were chosen with active flowering plants, but in much lower numbers (below 100 stems). Testing was made in a professional Agricultural Research Centre laboratory. Because our investigations are in progress and hopefully will continue in 2021 and beyond, we cannot reach any final conclusions yet. However, initial results showed that in the large colony there is a huge difference in potassium (K), calcium (Ca), boron (B), copper (Cu), magnesium (Mg) and nitrogen (N). Levels of all those elements were between 50% and 500% higher, indicating a correlation between those elements and colony size/health. We plan to do more analysis across further sites on an ongoing basis, as well as co-ordinate a European-wide study to find out whether our initial results are repeated elsewhere. Soil pH in all locations was in the range of 5.5 to 7.4 and in the best places 6.0.

"Epipogium aphyllum* forma *rosea"

E. aphyllum has only one named variant – the rarely-occuring forma *albiflora* where the flowers lack anthocyanin (red colour), giving the plant an overall transparent whitish to yellowish appearance. In August 2020 we found in one large population two separate clumps of strange-looking plants – even from a distance at first glance they looked different. They were overall "abnormally" reddish among many

Fig. 19 *"Epipogium aphyllum* forma *albiflora"*

"normal" ones, the stems especially, but also the developing fruit capsules. On closer inspection the fruit capsules of the reddish plants had a visibly different shape from all other "normal" ones (see Figure 20). In both "forma *rosea*" clumps (about 50m from each other), most seed capsules were the same, being wider than deep, looking as if two normal capsules were fused together. This shape was not seen on any of the normal plants.

Given how rare this reddish form is, it is difficult to decide whether this is just coincidence or a more consistently occurring phenomenon. It is certainly worth further investigation should more plants of this form be discovered, and subsequently set seed. Maybe therefore, if the yellow form of *Neottia nidus-avis* is called forma *sulphurea*, this reddish form should be called *Epipogium aphyllum* forma *rosea*.

Fig. 20 *"Epipogium aphyllum* forma *rosea "*

Acknowledgement
Special thanks to Toomas Hirse, who has been my partner in countless trips in the field and whose knowledge of habitats and maps is irreplaceable. He has probably seen most Epipogiums in Estonia in different places and discovered new places. Jätka samas vaimus! Thanks also to Sean Cole, who helped with translations into English and added other useful input to this article.

Erratum: Ghost in the Valley

Epipogium aphyllum var. *alba*

Photo by Rosemary Webb

An error occurred during the final print production stage for the last *JHOS* leading to an image switch in Rosemary Webb's latest 'I Will Have to Come Back Next Year' article.

Figure 10 was inadvertently replaced with a duplicate of Figure 11 so Rosie's image of *Epipogium aphyllum* var. *alba* was missing from the article. Apologies to Rosemary for this and here is the picture that should have been included.

A minor silver lining to the editorial cloud is that it does provide another opportunity to compare it with the interesting heavily pigmented "*Epipogium aphyllum* var. *rosea*" described and photographed by Rainar Kurbel in the preceding article and featured on the front cover.

Talks at Meetings 2021

Celia Wright

As Speaker Secretary for HOS, my role has been rather different from normal for the past 18 months. I've coped with online meetings for the last year, but a number of our members don't want to give a presentation online as they find the process daunting. For this reason alone, I'm glad that we are back for a live meeting at Leeds in early September. The programme includes good speakers who have waited a full year to give their talks – I'm sure we'll enjoy them. A booking form for the meeting is enclosed. None of this would be possible without Alan Gendle's thorough planning as meeting organiser and tenacity as problems were overcome one by one.

The future beyond September still feels too close to call. Hopefully, we will have a live meeting at Kidlington, but as I write this, we cannot be sure how government regulations may change before then, so once again I will have to plan for a live meeting but change this to online presentations if necessary, probably with a totally different programme. For this reason the Autumn Kidlington booking form will be

enclosed in the next issue of *JHOS*, not this one. I also need to know that members will come forward with offers of online presentations for November, possibly at short notice. If you are prepared to do this, you could help me a lot by letting me know soon. Offers of talks for live meetings are always welcome, either for this year or 2022. I look forward to seeing you back at live meetings soon.

Video Competition 2021

All entries need to be with Steve Pickersgill by the 11th August 2021, either by email hosvc@hardyorchidsociety.org or, for larger files, using one of the free transfer services such as WeTransfer or Dropbox. If the Leeds meeting has to be cancelled the competition will be held online, as it was in 2020, and details will be posted on the website and the Forum.

The following information is all dependent on what happens with regards to the restrictions that are in place at the time due to Covid. For the latest information please refer to the website.

Photographic Competition

There are new classes this year, please see the website for details and the rules. Under all eventualities, Digital Entries are to be emailed to Neil before the 16th October 2021,

If the Kidlington meeting has to be cancelled, prints need to be posted to and received by Neil before the 16th October 2021. Neil's address is inside the front cover on page 74. If you wish the return of your prints then please enclose an SAE. Neil will require notification of entries and a digital copy of the print emailed to neilevans@hardyorchidsociety.org before the 16th October 2021. If you are unable to take your prints to the meeting (if it goes ahead), they can be posted to and received by Neil before 16th October 2021.

Informative Photographic Display

If we are able to hold the meeting at Kidlington in person then please bring your Display along to the meeting. If we do not have a meeting then please enter the display as up to four A4 pages in a digital form (ideally landscape as pdf) by sending them to neilevans@hardyorchidsociety.org before the 5th November. See http://www.hardyorchidsociety.org.uk/informative-display.html for further information.

An unusual *Epipactis helleborine* mutation

Steve Tandy

A few years ago, I found a new site for Broad-leaved Helleborine on the outskirts of Wrexham with many hundreds of specimens. Amongst these were a handful of plants in close proximity which have a gross flower abnormality. I have seen these each year bar one since 2017. The flower buds start with a normal appearance, but then become large and bulbous. The flowers eventually open, but do not do so in the usual strict bottom-up order of normal flowers. When the flowers open, although the petals and sepals are perfectly normal, the male reproductive parts, from the column forwards, are copied 4 to 8 times.

All life needs a blueprint laying out the basic structure of the organism. In animals this is controlled by the HOX genes. These are highly conserved; they are the same across a range of families. The HOX genes in mammals for instance ensure that the body has a head with a mouth at one end, a rectum at the other, and a limb at each corner. In flowering plants, the flower layout is part of the functions of the MADS genes. While the genes controlling the ovary, petals and sepals in these plants are seemingly normal, something has happened to those controlling the column. I would hazard a guess that this is due to one of two mechanisms. Either there has been repeated gene duplication, or a lack of feedback once the original cell(s) that forms the column and associated structures has been created - basically an instruction that says one is enough is not operating.

That these are appearing year after year suggests that this abnormality is not causing the plants any grief, and they can live out a rather bizarre life. I have found five of these plants in total, with groups of three and two growing about 10 metres apart. Vegetative reproduction seems the likely cause of each group, but having two groups implies that more than a single seed carrying this mutation arose from a parent plant, or that one group seeded the other. However, on returning 14 and 28 days later it was obvious that no seed would be set this year (2020). Both the flowers and the ovaries were withered despite some initial swelling of the latter.

Perhaps coincidentally this site also has another mutated *E. helleborine* population. Found in 2020, there was another patch of seven plants, each of which, though having a flower spike, was completely flowerless. That it was a flower spike is

Fig. 1: The globular flower buds.
Fig 2: The open flowers showing multiple columns.
Fig 3: The erratic opening of the flowers.
Fig 4: Two weeks later with flowers dying away.

Photos by Steve Tandy


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Figs. 5 & 6: The plants with flowerless spikes.

Photos by Steve Tandy

demonstrated by the presence of bracts. There was no evidence of buds dropping off due to unsuitable weather conditions, and there are perfectly normal examples growing alongside them. I will have a look at these in future years, but needless to say it is impossible for these to have any offspring.

Anthocyanin-rich *Dactylorhiza maculata,* Heath Spotted-orchid

Richard Laurence

Populations of *Dactylorhiza maculata* are often characterised by their generally pale colouring with the labella markings usually much fainter than in *Dactylorhiza fuchsii*, (Common Spotted-orchid). More heavily marked specimens do occur, but the paler forms very often predominate, so it was exciting to see the photograph on the HOS Discussion Forum (7th June 2020) of an anthocyanin-rich *D. maculata* taken by Elliott Hails. This prompted me to write about this very rare variant and describe my experiences of it from the four sites in the British Isles where I have seen it.

Anthocyanin-rich forms of *Dactylorhiza* with an excess of colour have been recorded both in the Spotted-orchids and the Marsh-orchids. Here I am dealing with just the two Spotted-orchids. These are widely distributed throughout the British Isles, so it might be expected that anthocyanin-rich examples of both species would crop up regularly. They seem to with *D. fuchsii* and over the years many instances of this variant have been illustrated in different publications; indeed a beautiful example was shown on the Forum (22nd June 2020) with a photograph taken by Rob Stark. In 1991 this variant was given the name var. *rhodochila* by the late Derek Turner Ettlinger. Corresponding forms of *D. maculata* seem to be very rare; the earliest record which I can find is in a major article in the Botanical Society of Britain & Ireland (BSBI) publication *Watsonia*. The whole article was one part of a comprehensive analysis of the British & Irish dactylorchids by our President, Professor Richard Bateman, co-authored with Professor Ian Denholm (Bateman & Denholm, 1989). There was reference to a 1921 publication which described a blotch marked form of *D. maculata* found in this country, but no location was given. It was first named *Dactylorchis maculata* var. *concolor* but later reduced to a forma i.e. *Dactylorhiza maculata* f. *concolor*.

In the intervening years nothing seems to have cropped up until in June 2003 it was found on an open heath area of the New Forest amongst a large colony of *D. maculata*, Michael Chalk found a very small specimen which had a solid purple colouring on the labellum with just a small white edged margin. It was only 9 cm. tall with just seven flowers. The leaves and stem were spotted and also stained with anthocyanins. It was depicted in an article published in BSBI News (Laurence & Chalk, 2004). My photograph (Fig. 1) shows just a single flower. Another photograph of this plant is shown on page 47 in *Orchids of the British Isles* (Foley & Clarke, 2005). This plant did not reappear in the following years.

This brings us to 2006 and my second anthocyanin-rich specimen. In June of that year, whilst travelling around the Shetland Islands, one of the places visited was Scatness in the extreme south of Mainland. Here an area of coastal heath supported a small colony of *D. maculata*. These were quite remarkable for their diminutive size as with some plants no stem could be seen. It was as if the very small flower spike was resting on the ground. Amongst them was the specimen shown in Figure 2. Just as an aside both *D. maculata* and *Dactylorhiza purpurella* are very common in Shetland. Some meadows had profuse displays of both species. *D. purpurella* seemed quite versatile as I saw it growing wild in an unmaintained garden in Lerwick. Also in Lerwick, another one was growing out of the side of a wall. Normally plants of both species are quite small at these northern latitudes but there was a display of quite vigorous *D. purpurella* in a shallow ditch beside the A970 between Lerwick & Scalloway.

My third site was on a steep hillside meadow near Croscombe, Somerset, a place which I had visited regularly for a number of years and which always had a good showing of *D. maculata*. These were mainly confined to the lower part of the slope. The only other orchids found at this site were the occasional Bee Orchid and a few *D. fuchsii*, both on the higher parts of the slope. Over the years there were one or two examples of *D. maculata* which had a broad central swathe of colouring instead of the usual lines and loops. However, in May 2010 a very striking specimen emerged on which the labella had solid blotch markings almost all over but with contrasting white margins (Fig. 3). At first glance this plant may not look like a typical example of *D. maculata*. It was however positioned in the midst of undoubted examples of *D. maculata* and further up the slope was another plant which had colouring virtually all over the labellum and this was a typical *D. maculata* (Fig. 4). Might it be *D. fuchsii*? It also does not look like a typical example of this. Is it a hybrid? It did not stand out with characteristics such as hybrid vigour as it was of similar stature to surrounding plants. Elsewhere on the site there were no other obvious examples of hybrids and also the few *D. fuchsii* present did not show any tendency to have blotch marked labella.

Another feature possessed by *D. maculata* is that sometimes you see specimens with a pronounced greenish or yellowish suffusion surrounding the spur entrance. This plant did have this pronounced suffusion, although it may not be apparent in the photograph. I have yet to see this feature in *D. fuchsii* and if it does occur it is much rarer. The leaves and stem were typical *D. maculata* and did not possess any extra anthocyanins. So, all in all I am happy with it being *D. maculata.* This plant, like the New Forest specimen, did not re-emerge in the following years and this raises the question, why are some plants so short lived? Is there some weakness in anthocyanin-rich plants? I don't think so because another quite striking *D. fuchsii* which I followed each year at its Wiltshire site persisted for thirteen years and flowered in twelve of those thirteen years in spite of it being a small weak plant. Perhaps they have been infected with the dreaded black death, which is either a fungal or bacterial attack and can decimate many dactylorhizas. In any case this whole site has now greatly deteriorated due to the incursion of bramble and other rank vegetation.

On June 19th 2016 I accompanied Mike and Lauraine Chalk to Southampton Common to examine a large population of *D. maculata.* Amongst many normal specimens

Fig. 1: Anthocyanin-rich *D. maculata*, New Forest 2003.
Fig. 2: Anthocyanin-rich *D. maculata*, Shetland 2006.
Figs. 3 & 4: Anthocyanin-rich *D. maculata*, Somerset 2010.

Photos by Richard Laurence


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there were odd plants which were anthocyanin-rich. At this June date the plants were well past their best so in the following year 2017 we went on May 24th and found them largely in good condition. Figure 5 shows a section of this large population with an anthocyanin-rich example in the bottom right-hand corner. Most of the plants, as in the previous year, were normal *D. maculata* but again amongst these some had very intense, heavy but discernible markings (Fig. 6). Other plants had solid blotch markings completely devoid of any lines or loops and the colours were quite striking, ranging from a lighter shade (Fig. 7) to specimens which were a very dark purple (Figs. 8 & 9). The leaves and stems did not show any markedly different characteristics from normal specimens.

Apart from the above four sites, I was told of a further occurrence in the west of Scotland and Lang (2004) refers to examples having been recorded in Merioneth, Wales. No doubt after the latest Dartmoor record, others will crop up in the future.

Fig. 5: Population of *D. maculata* at Southampton Common 2017, showing an anthocyanin-rich plant bottom right.
Fig. 6-9: Anthocyanin-rich *D. maculata*, Southampton Common 2016.

Photos by Richard Laurence


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David Christopher Lang (1935-2020)

Phillip Cribb

David Lang at Castle Hill

Photo by Phillip Cribb

Members will be very sorry to hear that David Lang, the well-known British orchid expert, passed away on 23rd December 2020. He was a wonderful companion in the field and had an encyclopaedic knowledge of the Sussex flora and particularly of its orchids. I always found that keeping up with his long athletic stride and endurance left me shattered at the end of a long day on the South Downs. Undoubtedly his endurance came from his frequent trips to the Himalayas that resulted in a beautifully illustrated and evocative book entitled *Sikkim Himalayas: Travels in the Cloud Kingdom* (Pomegranate Press, 2003). From our viewpoint he will be remembered for his *Orchids of Britain* (Oxford University Press, 1980), *A Guide to the Wild Orchids of Great Britain and Ireland* (Oxford University Press 1989) and *Wild Orchids of Sussex* (Pomegranate Press, 2001). By profession, David was a veterinary surgeon, until his retirement, practising in the Lewes area of East Sussex but his spare time was largely spent orchid hunting on his beloved South Downs. Watching him meticulously counting Burnt-tipped orchids (*Neotinea ustulata*) on Mount Caburn provided an insight into his devotion to orchids. Those who knew him well will remember his warm and generous personality and his passion for orchids.

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Epipactis ×*bruxelles*: Hybrid Between Broad-leaved Helleborine and Green-flowered Helleborine

Grahame Preston

Until I thumbed through the hybrid section of *Britain's Orchids* by Sean Cole and Mike Waller, I had been unaware that a hybrid between *E. helleborine* and *E. phyllanthes* was possible. Intrigued, I decided to trawl through my photos to see if I had unwittingly encountered this hybrid. To my surprise and delight one plant from an SSSI in Gloucestershire from 27th July 2015 fitted the bill. Fortuitously, I had taken several images of it (albeit not the best quality), because it had been the only helleborine properly flowering in a mixed colony of broad-leaved and green-flowered helleborines on the day of my visit. The plant showed the following features:

E. helleborine features	General aspect of *E. helleborin*e Marked rostellum and viscidium Flowers not drooping Flowers showing pinker tones with age
E. phyllanthes features	Hairless upper stem Hairless shiny ovaries Green base to stem Leaf edge wavy (no close up available for cilia)
Combined features	Intermediate-coloured hypochile (mud-green) Almost glabrous Leaves uniformly short and rounded

I forwarded the images to Sean Cole, Mike Waller and Prof John Richards (the BSBI helleborine referee) and they all agreed that it was a very good candidate and very suggestive of the hybrid. This is potentially only the second record of *E.* ×*bruxelles* in Britain and Ireland, and the first with *E. helleborine* as the likely maternal parent. The other was discovered in Hampshire in 2010 and had drooping flowers more suggestive of *E. phyllanthes* as the 'mother'. Despite Covid-19 and repeated lockdowns, discoveries can still be made by using the time to closely study your old photographs. If the plant still exists DNA analysis might confirm its hybrid status.

Fig. 1: Impression of *E. helleborine*, but uniformly short, rounded leaves.
Fig. 2: Flowers become slightly pinker with age.
Fig. 3: Muddy green lining to hypochile and obvious viscidium.
Fig. 4: Virtually hairless upper stem and ovaries.

Photos by Grahame Preston


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