

**Journal
of the
HARDY ORCHID SOCIETY**

Vol. 19 No. 2 (105) Spring 2022



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Front Cover Photograph

Mike Chalk's photograph of *Ophrys insectifera* var. *ochroleuca* at Burham taken on 20th May 2015. See David Johnson's article on page 55.

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

A nicely varied issue this time with important information for Members, articles on both UK and European orchids as well as information for growers concerning the dreaded ‘Black Death’. For two reasons I need to draw especial attention to Terry Swainbank’s more scientific article. This includes a series of quite large and rather complex tables. We agreed to try out the idea of combining the printed *JHOS* article with an online resource to avoid squeezing these tables into the rather limiting A5 journal pages. Hence, this article has supplementary appendices available in the Members’ Area of the HOS website. Secondly and very sadly, Terry passed away before we could complete this process. With the agreement of his family I managed to complete the article and include his work here. Hopefully, this will serve to remember one of our fellow orchid enthusiasts as well as being of interest in its own right.

Chairman's Note

Carol Armstrong

Hope this finds you well. Spring is upon us and with the longer days I'm sure we are all planning to devote as much time as possible to the enjoyment of orchids. Over the past two years we have had to approach social interaction with great caution for our own safety, and the protection of others. My thanks are due to the HOS committee for adapting to the lock-down challenge and continuing to provide the membership with alternatives to our usual activities where they had to be cancelled. We discovered how much we could enjoy the species on our doorstep when we could not travel. Some orchids too, benefitted from the restrictions, for example, where accidental "nomowing" allowed orchids to flower in previously regularly-cut verges but there were also some orchids that struggled when reserve employees were furloughed or volunteers could not get to, or perhaps could not afford to, tend their charges.

We had, pre-pandemic, been considering how HOS could encourage greater awareness and appreciation of native orchids and we were proposing to support orchid conservation projects run by community volunteers or individuals with a donation. For a long time, giving advice and propagating plants has been a practical part of HOS activities to support our stated aims to further the study of our wild orchids but we also wanted, in the future, to be known for giving a modest financial contribution to efforts of the wider, general public who needed a little help to succeed with an orchid conservation project. Thus, post-lockdown, we are inviting both HOS members and the general public to apply for a grant from HOS that will be used exclusively for the benefit of orchid conservation. Please see the note from our Conservation Officer and Publicity & Outreach Officer for details.

A further outcome from facing the challenges of lockdown was that the Committee decided that it would be appropriate to change the date of the 2022 Spring Meeting and Plant Show, as during late spring and summer 2021 there appeared to be a reduction in infection rate. Hence the Spring Meeting has been moved to very end of spring and will be held on June 19th. It seemed to be less likely that we would have to cancel our spring indoor meeting by doing so. This also meant that we could give our talented growers an opportunity to showcase the species typically seen in flower in late spring. The photographic entries last year in our summer virtual plant show illustrated the wide range of species grown by our members and so we'd love to see them on the exhibits table. Welcome to Neil Hubbard, a new member of the committee, who is organising the plant show.

Don't forget that we have a Seed-Sowing workshop planned for August, if you want the best introduction to growing your own orchids. Our AGM will be held on the same weekend as the Malvern Show and so for many members this is also a great

way to indulge in orchids of many descriptions over a whole weekend at the two events. See Note about special entry price tickets to the show for HOS members. Keep checking out the website and join the forum for updates on walks and meetings. See Field Meetings note.

All of this is available to you as members and provided by volunteers within the society. Please think about sharing your talents, knowledge and enthusiasm by offering talks, walks, articles for the Journal and help on the committee. Enjoy reading your Journal and I hope to see many of you in 2022, indoors or outdoors.

Erratum: The Tiptree Tongue Orchids

A rather unfortunate typographical error found its way into Jonathan Greenwood's interesting and informative article about *Serapias lingua* at Tiptree in Essex. In the middle of the first paragraph on page 22 of the Winter 2022 *JHOS* the corrected sentence reads as follows:

'The community turned out in force to prevent a tractor and plough that turned up one Friday evening last year from doing its worst. On expressing our concern to Kler Group we were told it was in preparation for a non-invasive geophysical survey!'

Probably due to some over-zealous proof reading 'Kler Group' was wrongly corrected to the rather better known 'Kier Group'. Apologies for the error are due both to Jonathan and to Kier, who obviously had no involvement with any potential survey or proposed development work at the Tiptree orchid meadow. The error has been corrected in the on-line version of the *JHOS* issue that is currently in the Members' Area of the HOS website.

Malvern International Orchid Show, 17th – 19th June 2022

The Malvern Show will take place this year at the Royal Three Counties Show. The usual British Orchid Council low-cost tickets will be available this year at £8 per ticket. These can be purchased by HOS members for themselves, their families and their friends. To obtain tickets, send a cheque payable to 'Iain Wright' for the correct amount together with a stamped addressed envelope in which to send your tickets back to you, probably in early May. The deadline for requests to arrive is the 30th April.

Contact Iain Wright at iainwright@windmill.me.uk, telephone 07831 121 697. For postal enquiries, use Celia's address as shown inside the Journal's front cover..

Field Trips 2022

This year's trips have taken a while to put together. The uncertainty around Covid has meant that many potential trip leaders have been unsure of their travel plans. We are so grateful to the leaders who are giving up their time to share their love of wild orchids with us. It is really significant that the wardens of the important reserves that we visited last year have invited us back – demonstrating that HOS members are seen as responsible visitors by those on the front line of Britain's conservation efforts.

We hope in particular that new members will take advantage of these trips: as well as an excellent introduction to the orchids across the country, they are a convivial way to meet other enthusiasts. Members have multiple conservation and wildlife interests, so there is usually plenty to talk about. And, yes, the trips are free – just email the leader with your membership number. We normally collect a voluntary donation to any organisation that maintains a site visited. Last year we collected over £560 for conservation – a great effort, thank you.

Your Safety

Participants are responsible for their own safety. You must make your decision whether you are fit and healthy enough to participate in any particular walk. General indications of difficulty are given below, but on the day weather and underfoot conditions may make the trip more difficult. In general you should prepare as for a remote country walk and expect uneven ground.

The leader does not carry any first-aid or emergency equipment. The leader's role is to help you find your way around the area and help you to see more orchids than you would if you went on your own. It is not to ensure your safety – you are solely responsible for that. Areas visited often have no mobile signal.

General enquiries to [Field Meetings Co-ordinator](#) (see inside cover)

Saturday 30th April: near Swanage, Dorset

Leader: David Hughes Email: dhughes@hardyorchidsociety.org

Several miles of walking on the sea cliffs to see thousands of *Ophrys sphegodes*. This walk is very exposed to the elements. We will also see the other April orchids, *Anacamptis morio* and *Orchis mascula*. This year we will be taking a different route than in the past.

Thursday 26th May: East Kent

Leader: Colin Sillence Email: colinsillence@hardyorchidsociety.org

Park Gate Down and Denge Wood to see Monkey Orchid, Lady Orchid, Fly Orchid and Greater Butterfly-orchid. Up to 12 orchid species are possible. Less than two miles of easy walking. This trip requires car sharing as only limited parking is possible at the reserves.

Saturday 28th May: Exmoor (Lynton), Devon

Leader: Elliott Hails. Email: elliotthails@hardyorchidsociety.org

A trip to Exmoor to visit the only site in Devon which supports Lesser Twayblade. Up to four miles of walking on hilly, uneven terrain with limited footpaths. Numerous flowering and non-flowering plants recorded in 2021.

Tuesday 31st May: East Kent

Leader: Colin Sillence Email: colinsillence@hardyorchidsociety.org

To see Late Spider-orchids. This trip will have limited numbers and participants must respect all requests from the trip leader in view of the rarity of these orchids. Short downland walking.

Saturday 4th June: North Downs, Surrey

Leaders: Ken & Gillian Elsom Email: elsom@hardyorchidsociety.org

Shepleas is an orchid-rich SSSI on the dip slope of the North Downs. Expect to see Bird's-nest Orchid, Fly Orchid, Greater Butterfly-orchid, White Helleborine and Common Twayblade, potentially others too. Moderate walking of about five km.

Wednesday 8th June: Pewsey Downs, Wiltshire

Leader: Paul Bartlett Email: paulbartlett@hardyorchidsociety.org

We expect to see Burnt Orchid, Lesser Butterfly-orchid, Fragrant-orchid, Bee Orchid and others. Approximately three and a half miles of easy downland walking, only a little uphill. No cafes or toilets.

Saturday 11th June: Essex

Leader: Mike Parsons Email: mikeparsons@hardyorchidsociety.org

Chafford Gorge near Lakeside for Man Orchid, Bird's-nest Orchid and several other orchids. Coalhouse Fort for intriguing Early Marsh-orchid variants and others. We will then proceed to a site near Tiptree to see the *Serapias*, where we will hear the history of these intriguing orchids.

Saturday 18th June: Minchinhampton & Rodborough Commons, Glos.

Leaders: Colin & Angela Scrutton and Maureen & Nigel Denman

Email: CScrutton@hardyorchidsociety.org

The commons support a rich flora of orchids including Common Spotted-orchid, Common Twayblade, Common Fragrant-orchid, Bee Orchid, Pyramidal Orchid, and Frog Orchid. Lizard Orchid is a possibility and *bicolor* and *trollii* varieties of Bee Orchid may also be found. If time permits also Selsley Common for Fly Orchids. <https://www.nationaltrust.org.uk/minchinhampton-and-rodborough-commons>

Saturday 25th June: Sunbiggin to Asby, North Pennines, Cumbria

Leaders: Alan Gendle and Carol Armstrong

Email: AGendle@hardyorchidsociety.org

We will stop at a number of sites along the road between these villages. Five *Dactylorhiza*, *Gymnadenia* and both intergeneric and interspecific hybrids. Upland wet areas, but we will be walking only short distances.

Sunday 26th June: Waltby Greenriggs, North Pennines, Cumbria

Leaders: Alan Gendle and Carol Armstrong

Email: AGendle@hardyorchidsociety.org

A small reserve round railway cuttings set up in 1987 with a diverse orchid and general flora. Five *Dactylorhiza*, *Gymnadenia* and both intergeneric and interspecific hybrids plus Lesser Butterfly-orchid, Fly Orchid and Marsh Helleborine. See what can be achieved by sustained conservation efforts.

Sunday 3rd July: Minera Quarry, near Wrexham

Leaders: Celia and Iain Wright Email: celiawright@hardyorchidsociety.org

Disused limestone quarry with large numbers of several orchid species/hybrids, especially *Dactylorhiza*. We hope to find Frog Orchids in flower. Parking at one end of a 40 hectare site that is steep with gravelly slopes in places. (See *JHOS*: 16/4 & 17/4).

Special Visits

These trips are to see single groups of plants, so they are highly unpredictable in terms of flowering time. Each trip has unique site-specific joining arrangements, so your understanding of this will be appreciated.

Mid July 2022: Irish Lady's-tresses: Mid-Wales Coast.

Leaders: Sue Parker and Pat O'Reilly, Email: sue@first-nature.com

(Booking nearly full)

When flowering of these plants in 2022 is confirmed (probably around early July) joining instructions for visits (around mid-July) will be sent out by email (to the pre-existing list of interested parties). See Sue Parker's Winter 2022 *JHOS* article for background.

Red Helleborine: Windsor Hill, near Princes Risborough, Chilterns. Very Late June

Registrations to hosft@hardyorchidsociety.org

The orchids are in an enclosure so we can only get within a few metres of them – bring your best lenses. This trip will be on a weekday. The total walking is about a mile. BBOWT (the local Wildlife Trust) always has a fee per individual for guided reserve walks and indeed the warden will be on site to explain the history and current conservation policies. We need to collect donations to match these fees and to contribute to the recent extensive conservation efforts at this site.

Tongue Orchids: near Tiptree, Essex. End May/early June.

Leader: Jonathan Greenwood, Email: jmgreenwood@hardyorchidsociety.org

Jonathan will show us the Tongue Orchids on the Essex trip late afternoon on the 11th June, but may also show small groups around at a different time. Please email Jonathan if you are interested. This site is sensitive as it is on private land and the future of these orchids continues to be threatened by development. For more background see Jonathan's article in Winter 2022 *JHOS*.

HOS Member Open Meadows

Dave and Jean Trudgill open their orchid meadow under Scotland's Garden Scheme. Search for "The Steading at Clunie" on the programme's website. We may have an opportunity to allow members to visit a farm in the western Cotswolds where there are at least six orchid species growing in completely natural conditions on unimproved land. Email the Field Trip Co-ordinator if you are interested in attending an open day event.

HARDY ORCHID SOCIETY CONSERVATION GRANTS ("HOSCG") SCHEME FOR 2022

We are very pleased to announce the launch of this scheme.

The support that the HOS can give to wild orchid conservation through these Grants is appropriate to our Society's stated aims and the diverse interests of our membership, and it reflects our great passion for the UK's wild orchids. The input of the Forum respondents shows that there is an appetite for sponsorship activity from the HOS to increase interest in and conservation of wild orchids.

We are 100% sure the Society has a bright future, not least because it has aims and values that chime with increasing world awareness of the need to learn about, conserve and protect our natural world and environment. After all, our current constitution simply and succinctly states: "The Society's object is to encourage interest in, knowledge of, and conservation of Hardy Orchids." The Grants are a fantastic, positive and direct way of achieving that object.

We hope that the invitation to apply for funds will make a difference to conservation aspirations by encouraging groups or individuals to either "get started" or "keep going."

The Grant documentation can be found on the Hardy Orchid Society website: www.hardyorchidsociety.org.uk. Closing date for 2022 applications is 31st July.

Please note we would only hand over a Grant for maintenance once we have seen confirmation that the applicant has the permission of the landowner to carry out the maintenance.

Bill Temple, Conservation Officer
Andrew Parsons, Publicity & Outreach Officer

Dactylorhiza ‘Black Death’

John Scrace, Royal Horticultural Society

This apparently new and very aggressive disease of *Dactylorhiza* species first came to the attention of the Royal Horticultural Society (RHS) in 2014, when samples of affected plants were sent by Dr Roderick Woods to the RHS Plant Pathology department at Wisley. The samples were taken from Gibraltar Point National Nature Reserve, near to Skegness on the Lincolnshire coast. This internationally-important SSSI site covers an area of about 4.3km², and consists of sand dunes, salt marsh and other coastal features. In December 2013, parts of the reserve were affected by a tidal surge (the ‘North Sea Flood’) caused by storm Xaver, with the encroaching salt water damaging much of the vegetation over large areas, including extensive colonies of *Dactylorhiza* species and hybrids in the Freshwater Marsh area. Almost no *Dactylorhiza* plants appeared in this area in 2014. Since then, there has been a gradual recovery of the plants in this area so that a large, healthy population of *Dactylorhiza* was again present in the Freshwater Marsh by 2020.

Other areas, such as the East Dunes, were not inundated with the overtopping salt water in 2013, although they may have been flooded by rising water levels from below. *Dactylorhiza* plants in these areas also showed severe decline the following year (Figures 1 and 2). Large numbers of plants did not reappear at all in 2014, and those that did often showed symptoms that were more suggestive of a disease than simply the effects of flooding. In contrast to the Freshwater Marsh area, there has been no subsequent recovery of the orchid population in the East Dunes. A few orchids occasionally reappear, but they quickly develop symptoms as outlined below. The symptoms on plants that manage to grow back at all in the East Dunes consist of stunted growth, with dark brown lesions on the leaves. In many cases the lesions enlarge and merge together so that the leaf is killed. Where plants retain enough vigour to produce a flower spike, similar dark lesions often develop on the flower stalk, resulting in curvature, distortion and sometimes death of the spike (Figure 3). When the 2014 plant samples were received at Wisley, fungal spores were already visible on many of the lesions, and where this wasn’t the case they soon developed after incubation of the material at high humidity for 24 hours or so. The spores didn’t fit the description for those produced by *Cladosporium orchidis*, a known fungal pathogen of *Dactylorhiza* causing leaf spots and stem lesions (Wilson & Wilson, 2001). In fact it wasn’t possible from the spore morphology to determine the precise identity of the fungus.

Fig. 1: Gibraltar Point, East Dunes area with healthy orchid population, photo taken June 2012.

Fig. 2: The same area in May 2014.

Photos by Roderick Woods.



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The fungus was successfully isolated into aseptic agar culture from the material, producing slow-growing colonies that were initially colourless but eventually darkened as thick-walled hyphae developed (Figure 4). In addition to trying to identify the fungus based on morphological characteristics, DNA sequencing work was undertaken. It still proved impossible from its morphology (either in culture or on the plant material) for us to match the fungus to any known pathogen, and the sequencing results didn't provide a close match to any of the fungal DNA sequences deposited on Genbank, an open-access collection of nucleotide sequences encompassing more than 300,000 organisms.

Because we were having such difficulty with identification, cultures of the fungus were sent to the Mycology Department at the Royal Botanic Gardens, Kew, and to the Microbial Identification Service at CABI, both internationally-renowned for their expertise in identification of fungi. However, neither were able to conclusively identify the fungus. At this point it was decided to put the identification of the fungus on the back-burner, whilst attempts were made to prove that it was pathogenic and the actual cause of the symptoms exhibited by the affected plants. Whilst this seemed very likely, there was always a chance that it might instead be a secondary coloniser of the damaged plant tissues, or even an endophyte (a fungus usually residing harmlessly within a plant, that only reveals itself when the plant tissues die due to some other reason).

In order to prove pathogenicity to a level that is accepted by the scientific community, a set of procedures known as 'Koch's Postulates' must be completed. The potential pathogen (our fungus in this case) must firstly be recovered consistently into culture from the disease symptoms – as mentioned above this had already been done. Healthy plants of the same type must then be inoculated with the potential pathogen. If the inoculated plants develop the same symptoms as were seen on the original diseased plants, and the same organism can be subsequently re-isolated from the symptoms produced on those inoculated plants, Koch's Postulates is completed.

Initial attempts to complete Koch's Postulates were unsuccessful, due mainly to the difficulty in obtaining vigorous, healthy plants of a good size for use in the inoculation tests. The test plants are sprayed with a spore suspension of the fungus and then enclosed in plastic bags for 24-48 hours, which provides the very high humidity necessary for spore germination (and subsequent infection if the fungus is

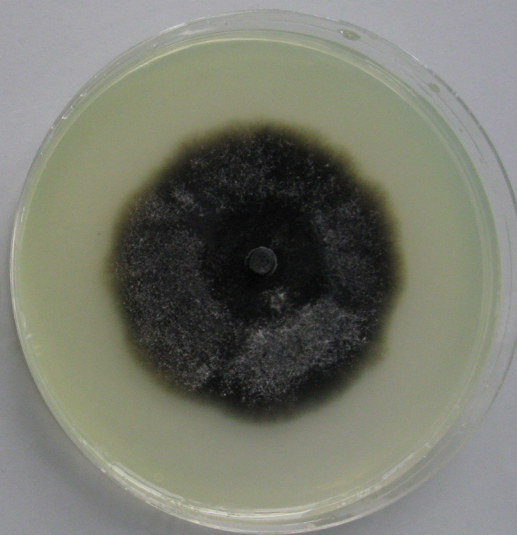
Fig. 3: Symptoms exhibited by surviving plants in the East Dunes area. These plants were sent to the RHS for examination.

Fig. 4: *Dactylorhiza* fungus in agar culture. Sucrose nutrient agar on left, potato carrot agar on right.

Photos by Roderick Woods (Fig. 3) & John Scrace (Fig. 4)



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pathogenic). A second set of ‘control’ plants is put through the same procedure, except that these are simply sprayed with water rather than the fungal spore suspension. If the ‘control’ plants develop symptoms of the disease it indicates that something has gone wrong with the inoculation procedure, or that the apparently healthy plants used in the test were in fact already affected by the pathogen.

In the first few attempts a high percentage of the test plants, both inoculated and controls, died off not due to the disease but because they didn’t have the necessary vigour to cope with the environmental conditions of the test. Eventually, however, some large tubers were kindly donated by Dave Trudgill, which when potted up grew into vigorous plants much more suitable for use in the tests. When these plants were inoculated with the fungal spore suspension, leaf spots began to appear within eight days. Within three weeks of inoculation the plants had developed typical and severe symptoms of the disease, and the fungus was successfully re-isolated from the lesions. ‘Control’ plants sprayed with water alone remained healthy (Figure 5). Koch’s Postulates was thus completed and it can be said with certainty that our fungus is the cause of the symptoms, and also a very aggressive pathogen.

Most of the inoculated plants, having developed severe symptoms of the disease, failed to emerge the following spring, and no tubers were found when the contents of the pots were examined. As the fungus isn’t normally found on the tubers of plants showing aerial symptoms of the disease it’s likely that severely-affected plants simply lack the vigour to develop a replacement tuber for the following year, rather than the tuber itself being attacked and decayed by the fungus.

Now that the fungus has been proven to be the cause of the disease, attention can return to its identification. It is hoped to include it in the early stages of the Darwin Tree of Life project, an ambitious programme aiming to provide full genome sequences for all of the 70,000 eukaryotic (having genetic material contained within a cell nucleus) organisms in Britain and Ireland. This would provide extremely valuable information. In the meantime, preliminary work by Dr Brian Douglas, the Darwin Tree of Life co-ordinator at Kew, has shown that the fungus is possibly a novel species within the genus *Pyrenopeziza*.

Fig. 5: Host inoculation test. *D. purpurella*, three weeks post-inoculation. Control plant on right.

Fig. 6: Leaf symptoms, showing diffuse ‘watersoaked’ margin to active lesions and light brown spore production.

Photos by John Scrace (Fig. 5) & Roderick Woods (Fig. 6)



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This aggressive pathogen poses a significant risk to *Dactylorhiza* populations. In addition to the extensive plant losses that still continue at Gibraltar Point, suspected cases have been found by Dave Trudgill (who has been battling the disease for several years at his own property in Scotland – Trudgill, 2015) at seven sites in Scotland (in Angus, Fife, Perthshire, South Uist and Stirlingshire) and one in Yorkshire. In most cases the disease at these sites has been confirmed by John Scrace from samples sent to him. In order to further determine the current distribution of the pathogen John would be grateful to receive samples from any other suspected cases. Microscopic examination of the material (and sometimes further testing) is required to confirm that the fungus is involved. Further details on sampling are given at the end of this article. So far the disease has only been found on *Dactylorhiza* species and hybrids, including *D. fuchsii*, *D. incarnata*, *D. maculata*, *D. praetermissa* and *D. purpurella*. However, if orchids of other genera growing close to affected *Dactylorhiza* plants show very similar symptoms it would also be worth sending these for examination.

The fungus produces large numbers of spores on the surface of the leaf and flower stalk lesions, and these are likely to be dispersed by rain splash. It's unclear whether the spores could also be wind-borne, in which case long-distance spread would be possible. However, even if this is not the case, heavy rain accompanied by strong winds could still lead to dispersal of spore-containing water droplets over many metres. Extended periods of leaf wetness are usually required by this type of pathogen in order for the spores to germinate and infect, so wet springs and summers are likely to lead to higher levels of disease than dry ones. It's also very likely that the fungus can survive on leaf debris, although precisely how long this could be for isn't known. It is recommended that strict hygiene should be practised if you have been on a site where the disease is known or suspected to be present. Hands should be washed thoroughly after handling plants that might be affected, and clothing should also be washed before visiting another site where *Dactylorhiza* might be present. Cleaning of footwear is particularly important. Ideally, footwear should be changed when leaving the affected site, brushed on-site to remove as much soil and plant debris as possible, and then washed thoroughly with hot, soapy water when back at home.

If you find plants in your garden that could be affected, then apart from sending samples for confirmation they should be destroyed as soon as possible. Burning is the best on-site option. Deep burial (well below normal cultivation depth) is also a possible option on level sites. Don't try and compost affected material, as home composting systems rarely reach the temperatures required to kill the propagules of many pathogens. For more details on disposal, type 'RHS – Disposing of Diseased Material' into your search engine.

References

- Trudgill, D. (2015) *Dactylorhiza* blight and its spread. *Journal of the Hardy Orchid Society* 12(2): 68-71.
- Wilson, M. & Wilson, B. (2001) *Cladosporium orchidis* – a fungal pathogen causing leaf disease in *Dactylorhiza*. *Journal of the Scottish Rock Garden Club* 27(2): 168-170.

***Dactylorhiza* ‘Black Death’**

If you find *Dactylorhiza* plants with symptoms matching those of the disease, please send some material for examination to:

John Scrace, 10 Richmond Drive, Shrewsbury, SY3 8TR

Clues that the disease could be involved include a diffuse, ‘watersoaked’ margin to the brown lesion if the pathogen is active and spreading through the leaf tissues. Lesions caused by other factors such as physical damage are more likely to have an abrupt junction between brown and green leaf tissue. It is sometimes possible to see light brown spore production of the pathogen on the surface of disease lesions, although this is relatively uncommon. Both of these features are present on the leaf in Figure 6.

Samples should consist of aerial parts of the plant only, wrapped in dry paper towel and then placed in a lightly-inflated plastic bag, within a Jiffy bag or box. If possible, try not to send material which has very advanced symptoms, i.e. almost completely dead. Please give full details of the location of the plants, including an OS grid reference where possible, together with an estimate of the number of plants at the site and the percentage of plants affected by the problem, and the species of *Dactylorhiza* if known. Include your own contact details, with an email address if you would like to know the results of the testing.

HOS Seed Sowing Workshop

Sunday 21st August 2022

Hagbourne Village Hall, East Hagbourne, OX11 9LR

This one-day workshop will cover all aspects of seed sowing and aftercare of both summer and winter-green orchids. The tutor will be John Hagggar, renowned for his skill at hardy orchid seed propagation. A booking form and more details are on the HOS website: www.hardyorchidsociety.org.uk

Any queries? Contact moira.tarrant@outlook.com

***Dactylorhiza* Black Death** **Bill Temple**

There is a fungus *Cladosporium orchidis* that is known to be able to cause leaf damage and death to a number of orchid species. It is believed that this pathogen can enter damaged areas of leaf and likes damp conditions. It has been reported that benzimidazole fungicides such as Carbendazim can prevent this attack. Unfortunately this fungicide has been withdrawn from sale in the UK. The advice given on treatment was to add a few drops of detergent to the fungicide solution and protect the ground under the orchid while spraying the fungicide, so that the fungicide could not reach the symbiotic fungi and kill them. It also advocated changing the top of the growing medium around the orchid before the start of the growing season in order to eliminate any fungal spores on the surface of the growing medium, alternatively to apply a mulch to prevent any of the fungal spores being splashed up onto the leaves (I personally would not mulch orchids). Hygiene measures advised are removal of all contaminated material and burning it rather than composting it or binning it.

At the Leeds meeting John Scrace gave us an update on the current knowledge about a new fungal (“Black Death”) pathogen and he has contributed an article in this *JHOS* on page 46. No investigations have been carried out so far to find a way to eliminate the fungus which is very aggressive. Obviously an orchid without leaves cannot carry out photosynthesis and make a significant replacement tuber so only robust specimens with large tubers are likely to reappear the next year if their foliage is attacked by the fungus.

The advice on treating *Cladosporium orchidis* may be helpful for this new pathogen at an EARLY stage of infection of this fungus or something as simple as sodium metabisulphite solution may work as it controls black spot on roses. As yet there is no documented proven method of control. One HOS member has reported some success with Fungus Clear Ultra (Triticonazole). This is a systemic fungicide so it may give protection if sprayed on the orchids before the disease appears. Note that Fungus Clear Ultra2 appears to be a sulphur dispersion. It is probably advisable to protect the ground from spray, although as the fungicide is systemic it may reach the symbiotic fungi in the orchid roots. Hopefully not enough will reach them to seriously harm the symbiotic fungus. If an improvement does not occur in a couple of days please treat the plants as late stage infection as below.

For late stage infection I think it would be wise to remove and treat all contaminated material as advised by John Scrace. I would also advise you to apply the biosecurity measures that he advocates.

The “Yellow” Fly Orchid *Ophrys insectifera* var. *ochroleuca* in Kent
David Johnson

The Fly Orchid *Ophrys insectifera* is widely distributed throughout the U.K., but is most common in the southern counties of England, especially on the North Downs of Kent and Surrey. It grows on the chalk mostly in light woodland, often towards the edge and alongside paths and rides, or in scrub. It has also adapted well to grow in disused chalk quarries and workings. In England and Great Britain as a whole the species is considered to be vulnerable to the risk of extinction, but although not yet rare or scarce in Kent, records show a steady decline in the county over the past 50 years.

There are no British subspecies of the Fly Orchid and it cannot be readily confused with any other British species. But it does occasionally display some variation in the colour, markings, or shape of the lip. There is one distinctive colour form which many recognise as var. *ochroleuca* but perhaps should more properly be termed forma (f.) *ochroleuca*. This is an extremely rare lutistic form, entirely lacking in anthocyanin pigment, with a pale yellow-green lip and whitish band (speculum) across the middle of the lip. This colour variant has occurred in Kent several times in recent years, whilst the only other records appear to be occasional ones from Hampshire, Wiltshire and Hertfordshire (Harrap & Harrap 2009).

My first acquaintance with var. *ochroleuca* was in 1989 when I came across two small plants (each only about 15 cm tall with two or three florets) flowering under quite dense scrub in mixed woodland high up on the downs above the Medway at Halling near Rochester. They were growing amongst a small colony of 20-30 ‘normal’ Fly Orchids. The colour variants were still there in 1991 but the whole colony had disappeared by 1993 when the scrub around it was cleared during coppicing work. I have no photographs from this site but there is a photograph of one of these plants taken in 1990 by D. Turner-Ettlinger in his ‘*Illustrations of British and Irish Orchids*’ (p. 183).

For many years this colour variant of the Fly Orchid has flowered in a disused chalk quarry near Burham (Maidstone) on the far side of the Medway. The earliest record I can find from this site comes from the Maidstone Museum herbarium, where a photograph of var. *ochroleuca* is displayed, taken by S.L. Melville during a meeting of the Kent Field Club on 6th June 1992 and labelled “Discovered in a chalk pit at Little Culand, Burham”. I first saw three plants of the variant on this site on 30th May 2000 growing with a colony of some 50-60 ‘normal’ Fly Orchids amongst scrub on a shelf of the old chalk quarry. The smallest plant was 25 cm tall with six florets, and was growing alongside a much larger ‘normal’ Fly Orchid (Fig. 2). The other two



variant plants were taller and one had nine florets. The following year I found five plants of the variant and there were two in 2002. But visits in subsequent years were fruitless, probably due to the ever burgeoning local rabbit population, which seemed to find Fly Orchids much to their liking. However, in May 2015 Mike Chalk visited the site and photographed the variant (cover illustration), so it has persisted here for a number of years.

More recently, in 2019, there was a significant find much further east in the county, when var. *ochroleuca* was recorded from the Kent Wildlife Trust reserve at Yockletts Bank. Daphne Mills photographed the plant on 11th May 2019 (fig. 3), and it is interesting to note the crab spider (*Misumena vatia*) making use of the pale colour of the flower as camouflage. This plant has persisted.

In addition to the foregoing records of var. *ochroleuca*, the distinctive and entirely lutistic form of the Fly Orchid, another atypical form, was recorded in May 2021 by Richard Moyses, the former Plantlife site manager, on the Ranscombe Farm Plantlife reserve in North-west Kent. This plant (Fig. 4) displayed flowers that were partially lacking in anthocyanin pigment, with a yellowish-brown lip and pale blue speculum. It seemed to accord with a form which Harrap and Harrap (2009) term var. *flavescens*, although this name does not appear to have been adopted or published elsewhere. Personally, I would consider the reduced pigmentation levels might be regarded as within the natural colour range between the distinctive colour variant which is var. *ochroleuca* and the ‘normal’ flower, and thus not distinctive enough to warrant any taxonomic rank. Nevertheless, this was an interesting and rare find.

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Fig. 1: ‘Normal’ Fly Orchid *Ophrys insectifera*.

Fig. 2: *Ophrys insectifera* var. *ochroleuca* alongside ‘normal’ Fly Orchid; at Burham on 30th May 2000.

Fig. 3. *Ophrys insectifera* var. *ochroleuca* at Yockletts Bank on 11th May 2019

Fig. 4 Variant Fly Orchid at Ranscombe Farm on 28th May 2021.

Photos by Lliam Rooney (Fig. 1), David Johnson (Fig. 2), Daphne Mills (Fig.3) & Richard Moyses (Fig. 4)

Cover image is Mike Chalk’s photograph of *Ophrys insectifera* var. *ochroleuca* at Burham on 20th May 2015

Seed and Seed Pod Dimensions as an Aid to Identifying Orchids in Fruit Terry Swainbank

Introduction

Interest is increasing in identifying orchids when they are not in flower, either in the spring when leaves are emerging, or when they are in fruit from early autumn onwards, maybe because observers enjoy a satisfying challenge. It is in fact quite curious that orchid fruits have not been studied greatly and over the years have received little coverage. In contrast in other plant families, such as the *Rosaceae*, the fruits (hips) are crucial to plant identification and they could well be helpful for the *Orchidaceae*. Examples of orchids in fruit are shown in Figs 1 (a) to (c).



Fig. 1: Orchids in Fruit: a) *Gymnadenia densiflora*; b) *Orchis mascula*;
c) *Corallorhiza trifida*.

All Photos by Terry Swainbank

With respect to orchids found in Britain and Ireland, Dymes (1921) looked at the seeds of what he called the Dactylorchids, noting differences in size and features of the epidermis. Young (1962) studied the fruits of *Epipactis* species. Cole & Waller (2020) provided some detail for the first time in a field guide. There have been a number of sophisticated studies, such as an electron microscope study into seed characteristics by Barthlott *et al.* (2014) which included British genera. They were also included in a study by Arditti & Ghani (2000) which focussed particularly on the weight, air space and floatability of seeds. Akçin *et al.* (2009) studied the seeds of Turkish orchids from a taxonomic point of view, amongst which were several species also found in Britain. All these studies agree with the thesis that seed and seed pod morphology have taxonomic value.

A reasonable attempt at the identification of a fruiting orchid can be made from the habitat in which it is found. A particular habitat will include no more than a handful of possibilities and in some cases just one or two. Appendix 1 (website link) gives a summary of the orchids to be found by habitats, based upon, but expanded from the listings in Cole and Waller (2020). It is meant as a guide because the categories are not exclusive and orchids can and do turn up in unexpected places, for example *Dactylorhiza fuchsii*.

A second clue comes from location and a little research on for example Wildlife Trust websites and social media will often indicate what species are likely to be encountered at a particular site. Appendix 2 (website link) shows, in a general way, where orchid species are to be found. Some have a distinctly northern distribution such as *Dactylorhiza purpurella* and *Gymnadenia borealis*, the commonest fragrant orchid in northern Scotland. Others are more southerly (but spreading northwards in some cases) such as *Dactylorhiza praetermissa* and *Gymnadenia conopsea*. Some orchids are restricted to the chalk beechwoods in southern England, such as *Epipactis leptochila*, and can be confused only with three other species.

So from a reasonable assessment of what a fruiting orchid might be, based on habitat and location can the accuracy of an identification be confirmed in any way? There may be extant leaves, though for many species they wither away quite early, an exception being the *Epipactis* genus whose leaves remain well into autumn. If there are leaves then are they keeled, spotted or unspotted, narrow or broad and so on. Usually ignored, the fruits, seeds and the stature of the fruiting spike should be an integral part of such a confirmation because these dimensions are characteristic enough to distinguish between species in many cases. This paper provides the results of work over several years to compare and contrast the sizes of seed pods and seeds of most of the orchids found in Britain and Ireland. Some of those measurements were made in the field (or from photographs taken in the field) but because they are typically around 1mm long, seed dimensions need microscopic examination.

Methodology: Seed pod and seed morphology

Morphology of the seed pods and seeds and the angle of attachment of the pods can provide confirmation of a putative identification. Over the past seven or eight years, I have made measurements on 38 species of orchids, where I was certain or near certain of the species. This involved follow-up visits in autumn to sites visited in the summer when plants were in flower. I am missing most of the rarest species, those appearing in Schedule 8 of the Wildlife and Countryside Act 1981, because in any case it is illegal to collect seed from these species without a licence. Many of these are of course site specific so you would be fully aware that you might encounter these species from your location. There are also a few others which I have not been able to include, which because they are small and hard enough to see when in flower (*Neottia*

cordata) or found in remote locations (*Neotinea ustulata*). I have also not spent time on hybrids, other than *Platanthera* × *hybrida*, and × *Dactylodenia st quintinii*.



Fig. 2: Seed pod length and width measurement – *Epipactis leptochila*, Oxfordshire.

An obvious point to make at the outset is that seed pod colour is unhelpful as they gradually turn from green to a warm brown as they dehisce. On the contrary, seed and seed pod dimensions are very useful provided some care is taken to ensure that what is being measured is ripe. Seed pod length stays fairly constant from early development from the ovary but the pods swell out as they ripen. When the pods are mature, but not at the point where seed has been dispersed and the pods have begun to split, I measured the size of fruit pods from photographs which include a scale. Obviously the seed pod needs to be flat to the camera with the scale in the same plane. An example of *Epipactis leptochila* is

shown in Fig 2, with the measurement of length and width. The flower remains are ignored, and the width is measured at the widest part. The shape of *Epipactis* seed pods is set earlier than for other species and changes little when dehiscence develops.

Ideally several pods should be measured taken at random where possible and an average taken, though typically the number is limited to those in the correct plane to the camera so as to avoid measurement errors. Pods at the top of the spike are usually smaller and often more crowded than those on the rest of the spike; flowering last they have had less time to develop. The length and width are characteristic of the species, and a convenient approach is to take the ratio of length to width, so as to avoid absolute measures. I have not for instance collected enough data to indicate

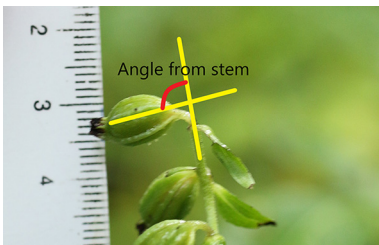


Fig. 2: Measurement of the angle of attachment of a seed pod to the stem – *Epipactis leptochila*, Oxfordshire.

whether latitude plays a part in the size of pods for a particular species, in the way that the spur of flowers of *Platanthera chlorantha* are shorter as one travels north. Using ratios should avoid any bias should it exist.

A second measure often possible from the same photograph, is the angle of attachment of a seed pods to the stem (Fig 3). Again the example is *Epipactis leptochila*, measured from the upright. The pods of both *Platanthera* species and *Cephalanthera damasonium* are

held almost upright, whereas those of *Epipactis* will be at best horizontal but often hanging down. The angle is a characteristic of the species.

Additional information which can be gained by examining the fruit spike is the fruit set percentage – how many flowers were pollinated and turned into fruits. But as the variability amongst a group of plants is high then an average for several plants is needed. An example of its usefulness is that the fruit set percentage in the autogamous *Epipactis* species is much higher than in those that are allogamous.

The next step is to take a few seeds and measure the length and width of a random sample (5-10) under the microscope at $\times 40$ or $\times 100$ and take averages. Examples are shown in Fig 4 (*Orchis mascula* $\times 100$), and Fig 5 (*Platanthera chlorantha* $\times 40$). Length is measured from tip to tip of the testa, and width at the widest part (which usually is where the embryo is). Seeds without an embryo are ignored, though it is interesting to note the proportion of ‘seeds’ without an embryo (essentially, an empty testa). It is not uncommon for seeds to be curved or bent and such curvature needs to be accommodated in the length measurement.

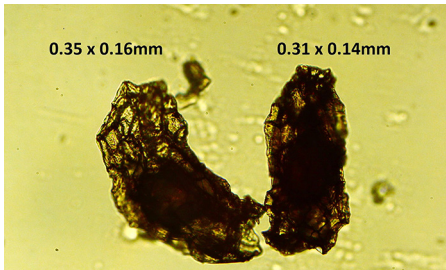


Fig. 4: *Orchis mascula* seeds.



Fig. 5: *Platanthera chlorantha* seed

Photos by Terry Swainbank

Results (additional data tables are available as appendices on the HOS website)

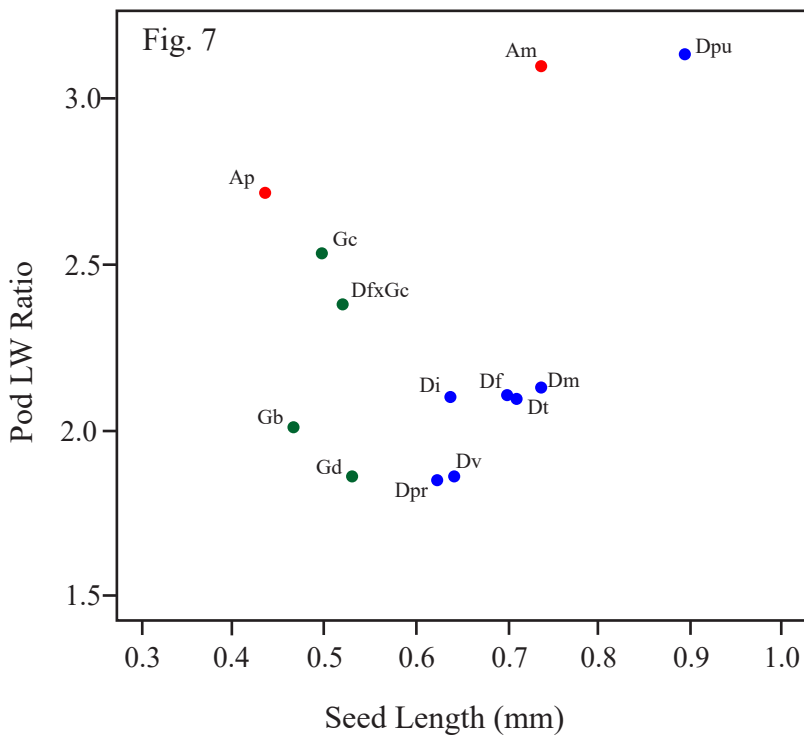
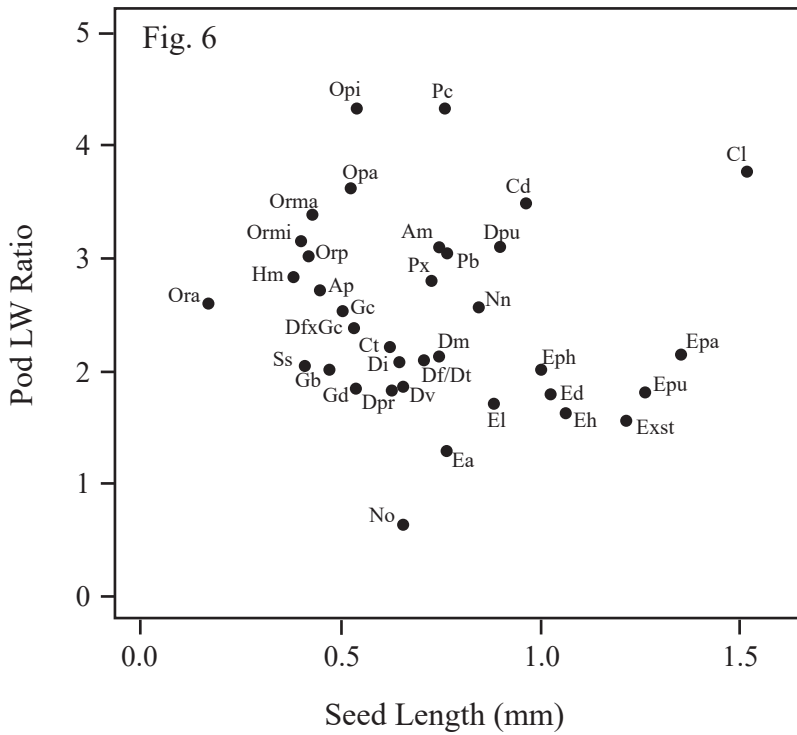
Averages on the five variables, seed pod length and width, angle of attachment, and seed length and width for 35 species and three hybrids are in Appendix 3 (website link). For convenience so that an unknown can quickly be compared with this data Appendix 4 (website link) gives the same data but sorted on Pod length to width ratio whereas Appendix 5 (website link) is sorted on Seed length. Finally, Appendix 6 (website link) has the angle of pod attachment to the upright sorted by smallest to largest. An unknown can be compared against the values in Appendix 3, though it should be noted that for some species the sample size was only one and therefore there is no statistical robustness. Nevertheless it is certainly possible to distinguish between genera, if not species, with some confidence.

Data is presented graphically in Fig 6, a plot of pod length to width ratio against seed length, these two variables appearing to be the most useful discriminants, especially when used in combination. A separation between genera and most species is clearly evident.

A further illustration of the usefulness of these measurements in discriminating between species in particular is given in Fig 7 which is a subset of Fig 6 looking at just three genera whose species often occur together: *Gymnadenia* (green); *Dactylorhiza* (blue); *Anacamptis* (red). Plotting the same variables (pod length to width ratio against seed length) shows a clear separation between the three genera and almost all the species. *Gymnadenia conopsea* is nicely separated from *G. densiflora*, a separation that can be difficult even when the plants are in flower, Encouragingly, one of the three hybrids included in the overall analysis, *×Dactylodenia st quintinii*, is part

Fig. 6: Plot of the ratio of pod length to width ratio against seed length.
 Fig. 7: Plot of pod length to width ratio against seed length for *Anacamptis*,
Dactylorhiza and *Gymnadenia* species.
 Species abbreviations are defined in the table below

<i>Anacamptis morio</i>	Am	<i>Epipactis ×stephensonii</i>	Exst
<i>Anacamptis pyramidalis</i>	Ap	<i>Goodyera repens</i>	Gr
<i>Cephalanthera damasonium</i>	Cd	<i>Gymnadenia borealis</i>	Gb
<i>Cephalanthera longifolia</i>	Cl	<i>Gymnadenia conopsea</i>	Gc
<i>Corallorhiza trifida</i>	Ct	<i>Gymnadenia densiflora</i>	Gd
<i>Dactylorhiza fuchsia</i>	Df	<i>Herminium monorchis</i>	Hm
<i>Dactylorhiza incarnata</i>	Di	<i>Neottia nidus-avis</i>	Nn
<i>Dactylorhiza maculata</i>	Dm	<i>Neottia ovata</i>	No
<i>Dactylorhiza praetermissa</i>	Dpr	<i>Ophrys apifera</i>	Opa
<i>Dactylorhiza purpurella</i>	Dpu	<i>Ophrys insectifera</i>	Opi
<i>Dactylorhiza traunsteinerioides</i>	Dt	<i>Orchis anthropophora</i>	Ora
<i>Dactylorhiza viridis</i>	Dv	<i>Orchis mascula</i>	Orma
<i>Epipactis atrorubens</i>	Ea	<i>Orchis militaris</i>	Ormi
<i>Epipactis dunensis</i>	Ed	<i>Orchis purpurea</i>	Orp
<i>Epipactis helleborine</i>	Eh	<i>Platanthera bifolia</i>	Pb
<i>Epipactis leptochila</i>	El	<i>Platanthera chlorantha</i>	Pc
<i>Epipactis palustris</i>	Epa	<i>Platanthera ×hybrida</i>	Px
<i>Epipactis phyllanthes</i>	Eph	<i>Spiranthes spiralis</i>	Ss
<i>Epipactis purpurata</i>	Epu	<i>×Dactylodenia st quintinii</i>	DfxGc



way between the two parents *D. fuchsii* and *G. conopsea*. Three species, *D. fuchsii*, *D. maculata* and *D. traunsteinerioides*, are too close to separate, and hence habitat and location would need to be considered. The result for *D. purpurella* is probably because it is some distance away from the rest of its genus, and more data points are needed for this species. Hybridisation within the *Dactylorhiza* will obviously make identification more challenging and I have made very few measurements on fruiting hybrids, but that is a situation no different from identifying plants in flower where hybridisation occurs.

Conclusions

Measurements of seed and seed pod dimensions together with the angle of attachment of seedpods to the stem from the upright provide a useful addition to the identification of a fruiting orchid. The dimensions of seeds and seedpods are usually ignored, but it is to overlook some useful diagnostic information. Indeed without any other information available it should be possible to identify an unknown orchid in fruit, provided the fruits are ripe, from just five measurements.

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Appendices Available in the Members' Area of the HOS Website

- Appendix 1: Generalised habitat preferences of most of the orchid species found in Britain and Ireland.
- Appendix 2: A broad categorisation of Orchid distribution in Britain and Ireland.
- Appendix 3: Average seed, seed pod dimensions and pod attachment angle to the upright for most British and Irish orchids
- Appendix 4: Pod dimensions sorted on length to width ratio.
- Appendix 5: Seed dimensions sorted by seed length.
- Appendix 6: Orchid pod angle of attachment sorted on smallest to largest.

Sojourns in Cyprus Colin & Angela Scrutton

Cyprus satisfies Colin's two main passions, geology and orchids. The island is one of the best places to view the structure of the sea floor, a huge chunk of which, an ophiolite, was thrust up by the northward movement of Africa against Europe to form the core of the island, the Troodos massif. However, we resist the temptation to explore this further and concentrate on the excellent orchid flora, following several other members who have contributed articles to this journal, most recently Christofides (2015) and Webb (2016). Our visits, so far restricted to late March and early April, have mainly covered the western part of the island together with the central mountains, Meikle's botanical divisions 1-3 of Christofides (2001, p.4). Pafos is a good centre from which to explore these areas and we have also stayed in Polis on the north-west coast, handy for the Akamas peninsula and Smigies nature trail.

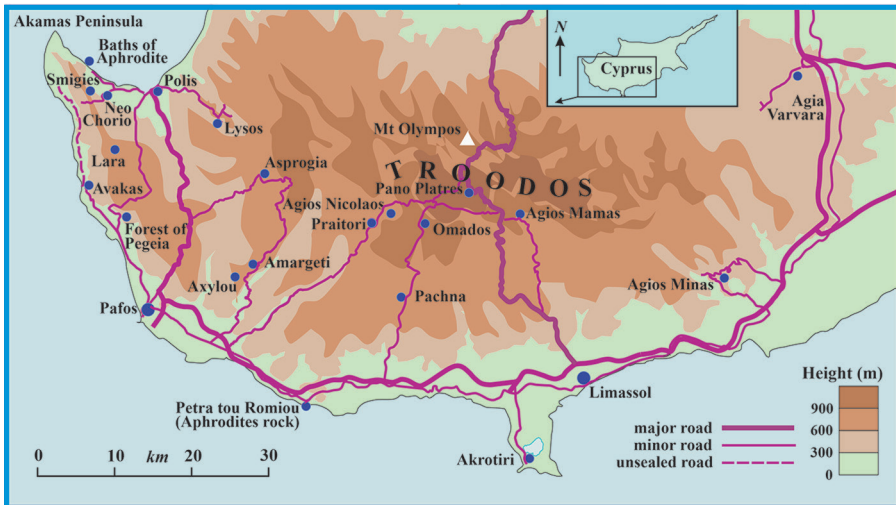


Fig. 1: Map of Cyprus showing locality details.

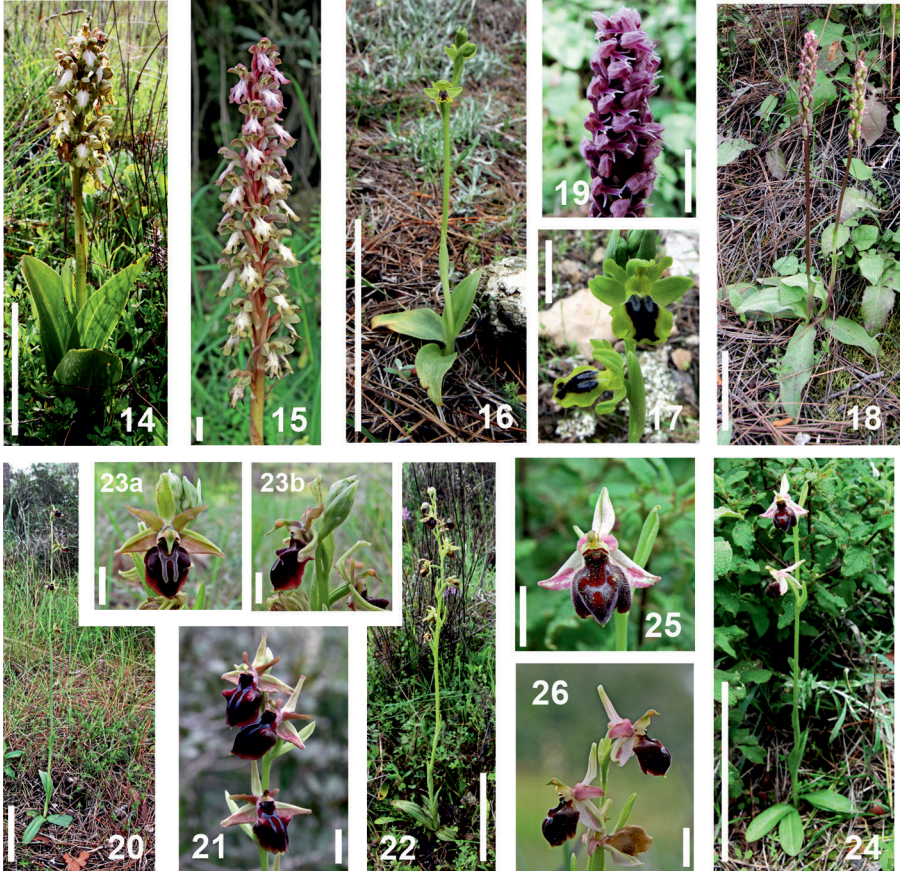
Of all the localities we visited, Smigies, in the Akamas Peninsula, a delightful area of light forest and grassy margins, had by far the richest haul of species. We found *Anacamptis morio* subsp. *syriaca*, *Dactylorhiza romana*, *Neotinea maculata*, *Ophrys apifera* var. *chlorantha*, *Ophrys argolica* subsp. *elegans*, *Ophrys fuciflora* subsp. *bornmuelleri*, *Ophrys fuciflora* subsp. *grandiflora*, *Ophrys fusca*, *Ophrys lutea* subsp. *galilaea*, *Ophrys sphegodes* subsp. *mammosa*, *Ophrys umbilicata* subsp. *lapethica*, *Serapias orientalis* and *Serapias vomeracea* flowering in late March to early April. In fields to the north of nearby Neo Chorio, we found *Orchis punctulata* and again *Op. apifera* var. *chlorantha*. It is a curious fact that apart from this yellow variant, we



Figs. 2-3: *Dactylorhiza romana* above Lysos. Figs. 4-5: *Anacamptis syriaca* at Smigies. Figs. 6-7: *Ophrys fuciflora* subsp. *bornmuelleri* in Forest of Pegeia. Figs.8-9: *Orchis punctulata* north of Neo Chorio. Figs. 10-11: *Ophrys fuciflora* subsp. *grandiflora* at Smigies. Figs. 12-13: *Ophrys apifera* var. *chlorantha* north of Neo Chorio.

Full plant scales 10cm; close-up scales 1cm.
All photos in this article by Colin Scrutton..

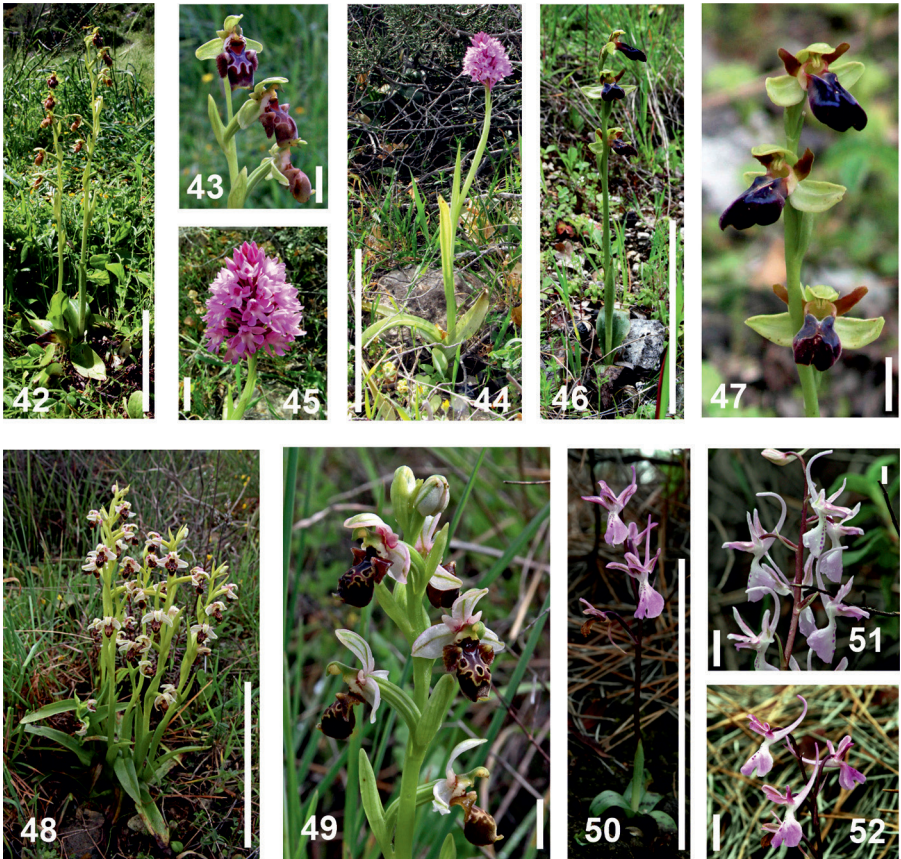
did not see any other Bee Orchids on our visits. *Op. punctulata* is an early flowering orchid and we were lucky to catch it with some flowers still in good condition. On the north coast at the Baths of Aphrodite we found *Anacamptis pyramidalis*, *Op. fuciflora* subsp. *bornmuelleri* and *Ophrys umbilicata* subsp. *flavomarginata*. Overall, the western margin of the island south of the Akamas peninsula has a good scattering of most of the orchid species mentioned above. It is served from Pafos by a coastal road, mainly unsealed, which can be difficult in places after rain.



Figs. 14-15: *Himantoglossum robertianum* [Fig. 14: Praitori, Fig. 15: Pachna].
 Figs.16-17: *Ophrys lutea* subsp. *galilaea* [Fig. 16: Smigies, Fig.17: Lara]
 Figs. 18-19: *Neotinea maculata* at Smigies. Figs. 20-21: *Ophrys sphegodes* subsp. *mammosa* at Smigies. Figs. 22-23: *Ophrys sphegodes* subsp. *mammosa* var. *transhyrcana*, [Fig. 22: Pratori, Figs. 23a & b: Lysos]. Figs. 24-26. *Ophrys argolica* subsp. *elegans* [24-25: Forest of Pegeia, Fig. 26: Smigies].



Figs. 27-29: *Orchis italica* at Praitori. Figs. 30-31: *Anacamptis coriophora* subsp. *fragrans* [Fig. 30: Petra tou Romiou, Fig. 31: Akrotiri]. Fig. 32-33: *Ophrys fusca* at Smigies. Figs. 34-35: *Ophrys fusca* subsp. *cinereophila* at Avakas. Figs. 36-37: *Platanthera holmboei* at Pano Platres. Figs. 38-39: *Serapias orientalis* at Smigies. Figs. 40-41: *Serapias vomeracea* [Fig.40: Agia Varvara, Fig. 41: Lysos]..



Figs. 42-43: *Ophrys umbilicata* subsp. *flavomarginata* at Baths of Aphrodite. Figs.44-45: *Anacamptis pyramidalis* at Avakas. Figs: 46-47. *Ophrys fusca* subsp. *iricolor* at Agios Nikolaos. Figs. 48-49: *Ophrys umbilicata* subsp. *lapethica*, at Praitori. Figs. 50-52: *Orchis anatolica* at Lysos.

From Polis, a road up into the hills leads to the area around Lysos where we found *Himantoglossum robertianum*, *Op. sphegodes* subsp. *mammosa*, *Op. sphegodes* subsp. *mammosa* var. *transhyrcana* and *S. vomeracea*. The much extended column apex characteristic of *transhyrcana* can be seen in Figs. 23a and b (compare, for example with the column apex in Fig. 26). Grassy woodland above the village yielded *D. romana*, *N. maculata* and *Orchis anatolica*. The latter includes the variety *troodii*, distinguished by an extravagantly curved spur arching over the flower, but not considered to merit taxonomic distinction by Kühn *et al.* (2019).

Polis to Pafos is served by a new dual carriageway and a minor road nearer to the coast. Taking the latter, the Forest of Pegeia is worth exploring, with *Op. argolica* subsp. *elegans*, *Op. fuciflora* subsp. *bornmuelleri*, *Op. fuciflora* subsp. *grandiflora* and *S. vomeracea* scattered among the trees.

Back on the south coast, a few miles east of Pafos, a minor road winds north into the hills. Two km south of Axyliou, *Orchis italica* can be found and higher up, two km north of Amargeti, *H. robertianum* and *Op. sphegodes* subsp. *mammosa* var. *transhyrcana*. Both *O. italica* and *H. robertianum* also occur further north at Asprogia. In fact *H. robertianum* is widespread across the area of Cyprus we covered. The road loops round to join the Polis-Pafos dual carriageway, an alternative point of access.

Further east on the south coastal highway, the road up the Diarizos Valley leads to Praitori, where on the right-hand side of the road just before the village was a magnificent field of *O. italica*, with hundreds of spikes scattered across the grassy slope. Mixed in were occasional spikes of *Op. sphegodes* subsp. *mammosa* var. *transhyrcana* and *Op. umbilicata* subsp. *lapethica*. On the other side of the road was a fine cluster of *H. robertianum*. Further on, around Agios Nicolaos, we found *H. robertianum* and *O. italica* again plus *Op. sphegodes* subsp. *mammosa*, and *Op. fusca* subsp. *iricolor*. The distinctive dark reddish-brown lateral petals sometimes found in *Ophrys fusca* subsp. *iricolor* can be seen in Fig. 47. *Op. sphegodes* subsp. *mammosa* was also flowering near Omodos. We continued up into the Troodos hills to Pano Platres, which was the only place we found a single specimen of *Platanthera holmboei*. Continuing east, *D. romana* was in flower at Agios Mamas.

We returned to the coast via Omodos and Pachna, where again *H. robertianum* was flowering, then on to explore the Akrotiri peninsula. Here *Anacamptis coriophora* subsp. *fragrans* was common along the borders of scrub and grassland just north of the salt lake. On our return to Pafos, we stopped at Petra tou Romiou (Aphrodite's Rock) where we found further examples of the same species.

We made one final trip further east up into the hills, through Agios Minas where we found *Op. fuciflora* subsp. *bornmuelleri* and *Op. fuciflora* subsp. *grandiflora*. Higher up, three km north of Agia Vavara on open grassland, were fine examples of *H. robertianum*, plus *Op. umbilicata* subsp. *lapethica*, *O. italica* and *S. vomeracea*.

Altogether, we saw almost half the orchid species recorded from Cyprus by Christofides (2001). It would be nice to think that we will have the opportunity to make another visit in the future to record some of the other species on this delightful island.

References

- Christofides, Y. (2001) *The orchids of Cyprus*. Self published.
- Christofides, Y. (2015) Cyprus Orchids – an update. *Journal of the Hardy Orchid Society*, 12: 54-60.
- Kühn, R., Pedersen, H.Æ. & Cribb, P. (2019) *Field Guide to the Orchids of Europe and the Mediterranean*. i-x + 1-430.
- Webb, R. (2016) I will have to come back next year: Cyprus. *Journal of the Hardy Orchid Society*, 13: 41-48.

Summer Plant Show 2022

The Plant Show will be held during the Southern Meeting at Kidlington on Sunday 19th June 2022. This provides another opportunity to exhibit the summer flowering orchids.

Entries should be submitted to the show secretary, Neil Hubbard, (contact details inside front cover) by 15th June 2022, the Wednesday before the show, stating which Classes and how many entries for each Class you would like to enter. Late entries will be accepted on the day. Details of Classes and Rules can be found on the website.

HOS Video Competition 2022

The HOS Video Competition will be held during the HOS Northern Meeting in September. Full details, including the Video Show Rules, are available on the HOS website:

<http://www.hardyorchidsociety.org.uk/HOS%201012/Video%20Show.html>

The Tony Hughes Trophy will be awarded to the best video. The trophy may be held for one year, and must then be returned. Judging will be by audience vote. In the event of too many entries for a one-hour session, committee members will view the material and reduce the entry to the required number. If time permits, all entries will be shown at the Autumn Northern Meeting. The winning video will also be shown at the Autumn Southern Meeting.

For 2022 entries must be sent in advance by August 17th to the Video Competition Organiser Steve Pickersgill, either by email (hosvc@hardyorchidsociety.org) or for larger files, using one of the free transfer services such as WeTransfer or Dropbox. The Video Competition Organiser will supply instructions for using WeTransfer on request.

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