Journal of the HARDY ORCHID SOCIETY

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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 website **www.hardyorchidsociety.org.uk**, January 2004 Journal, Members' Handbook or contact the Editor). Views expressed in journal articles are those of their author(s) and may not reflect those of HOS.

The Hardy Orchid Society Committee

Cover Photographs

Front Page: *Ophrys aveyronensis* in Aveyron, France
Photograph by Hilary Pickersgill, see article on page 56

Back Page: Marsh Helleborine, *Epipactis palustris*
Photograph by Jean Claessens and Jacques Kleynen, see article on page 64

Contents

Editorial Note

This *JHOS* includes a variety of articles, including a comprehensive report from the 2013 programme of field trips. Hilary & Steve Pickersgill have contributed a description of their French orchid holiday and Jean Claessens & Jacques Kleynen provide the next instalment of their beautifully illustrated and authoritative overview of orchid pollination. Away from *JHOS*, I am continuing to work on the new HOS website with the current focus on new pages for British and Irish orchid species. In that context, good new photographs to add to image galleries on the site are most welcome! The committee have agreed to make *JHOS* issues freely available on the website after they are 5 years old and relevant pdf files are being added as soon as they can be generated from the journal archives. More recent issues will be made available exclusively to members in the future. Lastly, I am still interested in Early-purple Orchid pollination data and welcome further observations on pollinators and fruit set. I will be providing a brief update from last season at the Spring Kidlington meeting and full details can be found on the HOS website.

Chairman's Note

Celia Wright

Following on from my Chairman's note in January, I'm pleased to tell you that the committee have been able to find volunteers to fill the roles of Chairman and Vice Chairman for the coming year and Chairman for 3 years after that. We also have an offer for the role of Speakers Organiser which will reduce the load on the Chairman. We shall need a new Vice Chairman and a Treasurer in a year's time as well as a Journal Distributor this summer, so do consider once more whether you could volunteer for any of these roles.

With the October 2013 and again with the January Journal, you all received a letter from Moira Tarrant, our Membership Secretary, asking those who pay their subscriptions by Standing Order to cancel their old one and set up a new one to reflect the increase in subscription rates from May 2014. Quite a lot of members haven't done this yet. If you're one of them, please do it now. Copies of Moira's letters and a Standing Order Mandate are on our website, together with the new subscription rates.

This year we are looking forward to another seed sowing workshop on Sunday August 17th. This is an excellent opportunity to learn how to grow hardy orchid seed symbiotically in a small, friendly group with John Haggar as an experienced and helpful tutor. If you'd like to come, contact Alan Leck, our Seed Bank Manager. You'll find his contact details inside the front cover of this Journal.

We would like some more articles on orchid culture in the Journal for those who are relative beginners. This might include growing in pots (in a greenhouse or outdoors) or in the garden. Anyone who has some practical experience of growing hardy orchids, even in a limited way, and would like to contribute, should contact Mike Gasson, our Journal Editor. Small contributions from a number of members would be very welcome.

Finally, HOS can obtain reduced price tickets on behalf of its members for the Royal Three Counties Show at Malvern on June 13-15th, which includes the Malvern International Orchid Show in a separate marquee. These are excellent value as each ticket costs only £6 instead of the normal £17, and allows the holder entry to the entire Show on any one day that does not have to be specified in advance. Iain Wright is co-ordinating the HOS requests for these tickets, so contact him with any queries (his contact details are also inside the front cover) or send him a cheque for £6/ticket made payable to Iain Wright, together with a stamped addressed envelope. Tickets will be posted to you during the second half of May. Last year this was an excellent show that I enjoyed very much, both for the extensive orchid displays and for all the other attractions.

My best wishes to you all. May you enjoy the hardy orchid season ahead.

More 2013 Photographic Show Winners

Fig. 1-1 (First in Class 1): Bird's-nest Orchid by Tom Turner
Fig. 5-3 (Third in Class 5): *Dactylorhiza sambucina* by Tony Hughes
Fig. 5-1 (First in Class 5): Early-purple Orchid by Tom Turner
Fig.12-3 (Third in Class 12): *Serapias vomeracea* by Colin Rainbow


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HOS Field Trips 2013

Malcolm Brownsword

Some orchid species, particularly the early-flowering ones, were up to three weeks late in flowering, so several field meetings were re-scheduled to later dates than those printed in the January edition of the journal. The following reports have been written by the individual field trip leaders or a participant.

18th May to Bernwood Meadows, Woodsides Meadow & Wendlebury Meads led by Malcolm Brownsword

We assembled at Oakley Wood and walked through woodland rides to Bernwood Meadows, where the flowering of Green-winged Orchids was the poorest for several years. A search for Early Marsh-orchids, usually in flower at the same time as the Green-winged Orchids, yielded none, although there was a fair show of Cowslips and Adder's Tongue fern. We decided to visit the small Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) reserve Woodsides Meadow on our way to Wendlebury Meads, both part of the important Wendlebury Meads and Mansmoor Close SSSI. Only a few Green-winged Orchids could be found at these two sites, and we were too early to see the Frog Orchid, Common Spotted-orchid and Heath Spotted-orchid in flower at Wendlebury Meads. However, we did see a varied flora and dozens of Orange-tip butterflies. Both areas are ancient 'ridge and furrow' hay meadows never treated with artificial fertilizers or pesticides. A collection of £30 was forwarded to BBOWT. The receipt I received referred to another HOS, the Hampshire Ornithological Society, which does actually exist!

19th May & 1st June to North Downs led by Ken & Gillian Elsom

A group of nine visited Sheepleas, an SSSI managed by Surrey Wildlife Trust on the dip slope of the North Downs. It is a mixture of chalk grassland, ancient and semi-natural woodland and plantation. Due to the late flowering season (the woodsman doing charcoal burning on the site had previously told us he thought everything was a month late) orchids which had been fully flowering in previous years were behind: we saw Common Spotted-orchid (*Dactylorhiza fuchsii*), Broad-leaved Helleborine (*Epipactis helleborine*) and White Helleborine (*Cephalanthera damasonium*) in leaf, Common Twayblade (*Neottia ovata*) with a few flowers out, Fly Orchid (*Ophrys insectifera*), Bird's-nest Orchid (*Neottia nidus-avis*) and Greater Butterfly-orchid (*Platanthera chlorantha*) in bud. On the plus side, Cowslips were still flowering and the Bluebells in the Weston Wood to the South of the site were in prime condition and we even saw Common Toothwort (*Lathraea squamaria*) under Hazel. In the afternoon we visited Ranmore to see Early-purple Orchids (*Orchis mascula*)

Fig. 1: Green-winged Orchids at Bernwood Meadows
Fig. 2: Green-winged Orchid (Pale Variant) at Bernwood Meadows
Fig. 3: Bird's-nest Orchid at Sheepleas, North Downs
Photos by Ken Elsom


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in prime flowering condition, amongst Bluebells, Cuckoo Flower, Dog's Mercury and Bugle by the North Downs Way. A short distance away we had a lovely view out from the scarp slope of the North Downs. Three members also went to Pewley Down, a Local Nature Reserve (LNR) managed by volunteers, and saw about 50 Man Orchids (*Orchis anthropophora*) coming up, a few with some flowers out.

Two weeks later we had eight people and went again to Sheepleas where many Bird's-nest Orchids were now coming out in flower and more were in bud. There was only one White Helleborine with three flowers out but with more plants in leaf and in bud. Many Greater Butterfly-orchids were in bud but only one plant in a sunny position was seen with a flower out. Common Twayblades and Fly Orchids were coming out in flower. Common Spotted-orchids were in leaf with some in bud and Broad-leaved Helleborines were in leaf. A bonus was to see charcoal burning in progress with a fire going and four chimneys steaming. We saw a huge Privet Hawk-moth clinging to a grass blade, under Ash. In the afternoon we went to Pewley Down and counted about 80 Man Orchids, most with about half of their flowers out. A Hobby (*Falco subbuteo*) was seen. We were very lucky to have another bright and sunny day. A collection of £50 was sent to Surrey Wildlife Trust.

9th June to Llynclys Hill, Shropshire, led by Marylyn & Malcolm Howard; reported by Iain Wright

Eight members visited Whitegates, a smallholding on the south east facing slopes of Llynclys Hill, just south of Oswestry. Much of the site is an ancient hay meadow, which is still hand cut for hay each year, now with the help of volunteers from Shropshire Wildlife Trust (SWT). Whilst there are a number of orchid species on and around the site, the main attraction was the Frog Orchid (*Dactylorhiza viride*). Because of the lateness of the season, the visit had been delayed for a week, to very good effect. In excess of twenty flowering Frog Orchids had appeared in the preceding week and were available to see and photograph in the bright sunny weather. In the small lightly wooded section at the back of the small-holding some Greater Butterfly-orchids (*Platanthera chlorantha*) were in full flower, interspersed with patches of the early growth of a large population of Common Twayblade (*Neottia ovata*), a scattering of Early-purple Orchids (*Orchis mascula*), which were just past their best and some large groups of going over bluebells There was also a solitary *Epipactis*, still in tight bud. The afternoon was spent on the adjoining Llynclys Common, an SWT Nature Reserve. This has a more northerly aspect and the season was quite retarded, with the good flowers still on the Early-purple Orchids and the other orchids there barely above ground. Nevertheless, this was a good visit on a warm summer day, to see a remnant population of a once common orchid.

Fig. 4: Early-purple Orchid at Ranmore, North Downs
Fig. 5: Man Orchid at Pewley Down
Fig. 6: Early-purple Orchids at Whitegates
Photos by Ken Elsom (4 & 5) & Alan Bousfield (6)

15th June to North Dorset Downs led by David Hughes

Ten HOS members gathered on a blustery day near Shaftesbury in Dorset to visit Fontmell Down. The late season meant that the common orchids were in perfect condition, especially Greater Butterfly-orchid (*Platanthera chlorantha*). Fragrant Orchids (*Gymnadenia conopsea*) were only just appearing and Bee Orchids, normally in profusion at this time of year, not at all. The bonus for the day, however, was seen when we moved on to Martin Down nearby and found Burnt Orchid (*Neotinea ustulata*) in perfect condition and in reasonable numbers.

20th June to Kent led by Alan Blackman

Heavy rain greeted six members as we met near Folkestone. We donned waterproofs and set off to be rewarded with approximately 40 flowering spikes of *Ophrys fuciflora*, most of which were in good condition. Also at the site were some very nice *Orchis anthropophora*, *Dactylorhiza fuchsii* and *Anacamptis pyramidalis* just starting to flower.

We headed off to Sandwich and had a good "picnic" and managed to dry off at Sandwich Bay Bird Observatory. The rain had now stopped and during the walk across the dunes to the coast there was even a bit of sun. The *Himantoglossum hircinum* were very numerous but only a few were in full flower. There were many *Dactylorhiza praetermissa* in full flower, including a good number of spotted leaved forms (var. *junialis*). Also some very nice *Neottia ovata,* a few *Gymnadenia conopsea* and *Anacamptis pyramidalis* were just coming into flower. Other flora of interest were many *Orobanche caryophyllacea* and *Orobanche minor*. Also, we were treated to many Skylarks, Cuckoos and even some

Fig. 7 (above): Frog Orchid (Coloured Pencil Effect) at Whitegates
Fig. 8: *Neotinea ustulata* at Dorset Downs
Fig. 9: *Himantoglossum hircinum* in Kent
Fig. 10: Site of the Kent field trip
Photos by Alan Bousfield (7), David Hughes (8) & Alan Blackman (9&10)


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Common Blue and Small Heath butterflies. Altogether a very successful and enjoyable day.

23rd June to Aston Clinton Rag Pits, Grangelands & Pulpit Hill led by Malcolm Brownsword

Due to an initial slow response from HOS members, we were joined by several members of the Oxford and District branch of the Alpine Garden Society. Although the show of Chalk Fragrant-orchids at the Rag Pits was relatively poor this year, there were probably still in excess of 10,000 flowering plants to see, as well as tens of Greater Butterfly-orchids, many hundreds of Common Spotted-orchids, tens of White Helleborine, some surprisingly still in flower, and over a thousand Common Twayblades. Despite the late date, Pyramidal and Bee Orchids were still not in flower, but bonuses were the presence of a variegated Common Spotted-orchid and a variegated Twayblade. Several Roman snails, brought out of hiding by the heavy rain during the first hour of this visit, were seen as well as *Daphne mezereum*.

Just before lunch we were shown two roadside plants of the *rosea* form of Violet Helleborine. On arrival at Grangelands the sun came out and we found a good specimen of the hybrid between Common Spotted-orchid and Chalk Fragrant-orchid, as well as two white specimens of the latter species. Horehound and Common Gromwell were also seen. We then travelled to Pulpit Hill in the hopes of finding Musk Orchids. These had been late to flower in 2012, so we were surprised to find about a dozen plants just in flower. A collection of £30 was forwarded to BBOWT.

Fig. 11 (above): Variegated Twayblade at Aston Clinton
Fig. 12: *Ophrys fuciflora* at Kent
Fig. 13: Musk orchid at Pulpit Hill
Fig. 14: White-flowered *Gymnadenia conopsea* at Grangelands
Fig.15: Frog Orchid, *Dactylorhiza viride* at Whitegates
Photos by Malcolm Brownsword (11, 13 & 14), Alan Blackman (12) & Celia Wright (15)


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25th June to South Cumbria led by Alan Gendle

The party of 15 set off from Tebay and headed north to a roadside site north of Orton. The verge contained *Dactylorhiza purpurella, Gymnadenia borealis, Neottia ovata* and some fine large *Dactylorhiza viridis* of the *longibracteatum* variety. The party next visited a traditionally managed pasture which is an SSSI north of Orton. The following Dactylorhizas were seen, *D. purpurella, D. maculata* & *D. traunsteinerioides*. In amongst the *D. traunsteinerioides* there was a hyperchromic plant. *Gymnadenia borealis* was present and had produced hybrids with one of the marsh orchids, most likely *D. purpurella*. Also, a plant that was possibly a *D. traunsteinerioides* × *purpurella* hybrid was seen. The common *D. purpurella* × *maculata* hybrid also occurred at several locations.

The next stop was at Tarn Moor. Both subspecies of Early Marsh-orchid occur here, *Dactylorhiza incarnata* ssp. *incarnata* & ssp. *pulchella*, plus *D. purpurella* and *Gymnadenia borealis*. The site supports a large population of attractive *D. incarnata* ssp. *incarnata* × *purpurella* hybrids. The find of the day was a hybrid between *Gymnadenia borealis* and *Dactylorhiza incarnata* ssp. *pulchella* which was just starting to flower. Sadly, four days later the plant had been eaten by cattle. Moving on east we visited another SSSI well known for *Pseudorchis albida.* Unfortunately the one plant with a flowering spike was still in tight bud. We saw more *D. purpurella*, *D. maculata* and hybrids between the two, *D. incarnata* ssp. *pulchella*, *G. borealis* and a few *Orchis mascula* were still flowering.

During a visit to Cumbria Wildlife Trust's Waitby Greenriggs reserve we saw the following: *Ophrys insectifera, Platanthera bifolia, D. purpurella, D. fuchsii* & hybrids between them. Two spikes of *D. viridis* were observed. *Neottia ovata* was present across the reserve. Finally we visited a beech wood near Kirby Stephen to see several groups of *Neottia nidus-avis.* We returned to Tebay at 18.30 having enjoyed some warm sunny weather and having seen a multitude of orchid species and hybrids.

Fig. 16 (above): Pugsley's Marsh Orchid in Cumbria
Fig. 17: Pitarrig Meadow, Pitlochry
Fig. 18 Small-white Orchid at Pitlochry
Fig. 19: HOS members at Pitlochry
Photos by Alan Bousfield

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30th June to Pitlochry, Perthshire led by Alan Bousfield

We were blessed with fine weather, otherwise plan 'B' was a trip around Bell's Distillery and a couple of drams to keep the cold out. The ten members and I met at the Pitlochry Tourist Information, where car sharing was organised for the day, due to limited parking being available at the sites. Then it was a five minute drive to Pitarrig, a farm's meadow (thanks to Bobby King for permission) where there were masses of Northern Marsh-orchids, Heath Spotted-orchids and their hybrids, Early Marsh-orchids of subspecies *pulchella* and a few Heath Fragrant-orchids. The highlight of the morning was when we found hybrids of Heath Spotted-orchid with both Common Spotted-orchid and Heath Fragrant-orchid.

In the afternoon we visited Keltneyburn (about seven miles from Aberfeldy) owned by Scottish Wildlife Trust and an SSSI. On their website it states that there are eight species of orchids, but we managed nine (they may not have counted Common Twayblade) including Small-white Orchid, Greater Butterfly-orchid and Bird's-nest Orchid. Keltneyburn was a complete change of habitat from the morning's short grassy meadow, very undulating and the grass was long, making it more difficult to find the different species of orchid. By 16.30 everybody was 'orchided-out' so it was back to Pitlochry and the parked cars, ready for the individual journeys home after a very enjoyable day.

16th July to Ladle Hill, Hampshire led by Bill Temple

This field trip to see the late flowering form of Burnt Orchid was delayed because of the

Fig. 20 (above): Lindisfarne Helleborine, *Epipactis sancta*
Fig. 21: HOS members at Llynclys Hill
Fig. 22: Pugsley's Marsh Orchid at Cumbria
Fig. 23: *Liparis loeselii* var. *ovata* Kenfig.
Photos by Colin Scrutton (20), Alan Blousfield (21 & 22), Ken Elsom (23)


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Pyramidal Orchids with Burnt Orchid at Ladle Hill
Photo by Bill Temple

lateness of flowering this year. However, a sudden hot dry period occurred and many of the Frog Orchids were past their best and the Common Spotted-orchids had gone over. Some of the participants went on to an Oxfordshire reserve to see Marsh Helleborines and were rewarded with a bonus – apart from thousands of Marsh Helleborines, a dozen or so Marsh Fragrant-orchids were found in excellent condition.

21st July to Tynedale, Holy Island & South Tyne Valley led by Colin and Angela Scrutton

Despite early reconnaissance suggesting that at least some flowers would be out on the due date, the trip had to be delayed by a week to be sure of finding spikes in reasonably full flower. Unfortunately, although the trip had long been full, only one participant could make the new date! There were fewer Lindisfarne Helleborines (*Epipactis sancta*) than usual, but some very good spikes. Marsh Helleborines (*E. palustris*) were abundant and in good condition, but there was little else still worthy of a photograph. Even the Common Spotted-orchids were in poor condition. Also, there were fewer Tyne Helleborines (*E. dunensis* var. *tynensis*) this year, but again some excellent spikes.

Our intention was to visit Bishop Middleham Quarry in Co. Durham on the Monday, where the Dark-red Hellborine (*E. atrorubens*), Pyramidal Orchid (*Anacamptis pyramidalis*), Common Spotted-orchid (*Dactylorhiza fuchsii*), including the *alba* variety, and Fragrant-orchid – mainly Marsh Fragrant-orchid (*Gymnadenia densiflora*) but the odd Common Fragrant-orchid (*Gymnadenia conopsea*) were in flower. However, our participant decided to visit the site on his way home on Sunday evening. The conditions were excellent for photography with very little wind on Holy Island – a rare event in our experience!

10th August to Kenfig, Glamorgan led by Mike Clark

Ten members attended this field meeting held in fine weather and the target of three Helleborine species and two variants were seen. Fen Orchid was also seen in flower.

Mistaken identification

Alan Gendle

No doubt many of our members will be familiar with the *Gymnadenia* family in the UK − *Gymnadenia borealis*, *G. conopsea* and *G. densiflora*. Many books on our native orchids mention another member of the family, *Gymnadenia odoratissima*. This species is found in Europe and it was reported in 1912 at Blackhall Rocks in County Durham. This record is dismissed as being erroneous. Comparing *G. odoratissima* with our native *Gymandenia* species, I often wondered how a mistake could be made as they are obviously so different. *G odoratissima* has long, white lateral sepals, a small, weakly lobed labellum and a very short spur. At Cumbria Wildlife Trust's Waitby Greenriggs reserve all 3 subspecies of *Gymnadenia* can be found and also the white flowered *albiflora* variety of each subspecies. Whilst on the reserve recently (I am the honorary reserve manager) I noticed a strange white flowered *Gymnadenia*. It had all the attributes of *G. odoratissima*, long white sepals, short labellum and short spur. It was actually an aberrant form of *Gymandenia borealis* var. *albiflora*. A photograph e-mailed to Richard Bateman confirmed my conclusion. Looking at the images one can easily understand how a mistaken identification could take place if the finder in 1912 found a plant similar to the one that I found 98 years later.

Top: *G. odoratissima* from the Lake Garda area of Italy.
Bottom: *Gymnadenia borealis* var *albiflora* found on the Waitby Greenriggs reserve in Cumbria, about 50 miles from the site of the original 1912 aberrant plant.

Photos by Eric Gendle (top) & Alan Gendle (bottom)

French Holiday 2013: Part 1 Aveyron

Hilary & Steve Pickersgill

We had been to France in May 2012 but as the season was late we did not find the two key *Ophrys* in the Aveyron so that decided our first stop in 2013. We set off a week later than the previous year thinking that we would be sure to find *Ophrys aymoninii* and *Ophrys aveyronensis* in flower − but we had reckoned without an even longer and harsher winter than before! We have a caravan and like to play things by ear which seems to work well for us. We drove down through the middle of France and broke our journey at Issoire. There is an excellent campsite near a large lake on the south side of the town. After a night serenaded by the frog chorus from the lakeside we bought breakfast from the mobile baker and had the best pains aux raisins that we have ever tasted. From the autoroute between Issoire and Millau we had good views of swathes of cowslips, white narcissi and tiny yellow daffodils. Should that have warned us that things were late? When we reached the campsite our first challenge was to find a pitch that was dry enough to use. Surely this could not be a hint of things to come?

Our nights on this site were soothed by the song of nightingales. Our first forays took us to the area round St Rome de Cernon. We explored sites around a crossroads where we had found a lot of orchids in 2012 but one of the best fields for sheer numbers had been ploughed and planted − a disappointing start. Just below that field a patch of waste ground was studded with *Ophrys lutea* which we had not found in 2012. There were a few *Ophrys* in bud, but that was all. Steve fared better in the scrub to the side, where he found a few *Anacamptis morio* ssp. *picta*, *Limodorum abortivum*, *Cephalanthera longifolia* and *Ophrys insectifera*. Another slope had large numbers of *Limodorum* but all early spikes in tight bud, huge numbers of *A. morio* ssp. *picta*, which were in perfect condition and many *Orchis anthropophora* coming into flower. A fellow orchid hunter on this site said that he had been visiting the area for 24 years and he felt the season was about a month late compared with the average.

We had intended to visit Lapanouse next. The road we had used last year was closed so we detoured via the road to La Bastide – a treat as it turned out as the roadsides were punctuated with *Orchis purpurea* and *Orchis mascula* in a variety of sizes and hues. They were a joy to see, brightening a dull day for weather. Unfortunately, the

Fig.1: Aveyron orchid meadow
Fig.2: *Ophrys lutea*
Fig.3: *Op. aymoninii*
Photos by Hilary Pickersgill


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road to Lapanouse was closed for repairs to the bridge so we were very disappointed. We spent the rest of the day exploring the road margins on the road to Montredon. The stands of *O. mascula* and *Orchis simia* were spectacular. Once again we enjoyed *O. purpurea* in a range of colours from the palest pink to deep violet, and we were very excited when we spotted *Op. aymoninii* with their first flowers fully open. A patch of waste ground near the junction looked as though it was devoid of anything of interest but eagle eyed Steve spotted the first *Neotinia ustulata* and more careful searching gave us a total of about a dozen. Hilary explored some more waste ground down a track behind a big building and added *Platanthera bifolia* to the list and amongst the dozens of *O. simia* was one pure white individual.

Day 2 took us to the abandoned village of Caplac. In 2012 we found very little in flower but this time, in addition to more examples of the *Orchis* seen on Day 1, we found *Orchis militaris*, *Ophrys scolopax*, other *Ophrys* in seed, as well as *Anacamptis pyramidalis* and *Himantoglossum hircinum* in bud. There were large numbers of *O. anthropophora* in flower and one beautiful hybrid of *O. anthropophora* with *O. simia*, a first for us. In 2012 Steve spotted a praying mantis at this site and he was pleased to find another one this year. We then headed up the Tarn valley and on to the Causses above Les Vignes. We explored an excellent site at the top of the hill last year and we were keen to see what delights it would hold this year. All the usual suspects were there in good numbers with more *Op. aymoninii*, a single *Orchis provincialis* and eight strong spikes of *Neottia nidus-avis* in bud. A short distance along the road we found a few *Dactylorhiza sambucina* but apart from that the Causses proved to be rather disappointing in this area. We crossed over the Tarn and headed out towards Massegros and Boyne. We found nothing new but in places the roadsides were ablaze with strong spikes of *O. mascula* and occasionally *O. simia*. *O. anthropophora* was just coming into flower and we found a few *Op. aymoninii* showing their first flowers. The sun dropped lower in the sky and we enjoyed beautiful countryside highlighted by wonderful lighting as we headed back to Millau for a rather late meal.

Overnight the rain hammered down and we woke to find parts of the campsite flooded once again. By the time we set off the rain had stopped and the sun was out. We headed for Lapanouse with high hopes and we were relieved to see that the workmen had gone and the road was open. Our first sight of *Op. aveyronensis* in the car park at the station was not unexpected as the wind had got up to something

Fig.4: *Neotinia ustulata*
Fig.5: Hybrid of *O. anthropophora* with *O. simia*
Fig.6: *O. simia*
Fig.7: *O. militaris* × *O. purpurea* hybrid
Photos by Hilary Pickersgill


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approaching gale force, as it does so often when there is an important flower to be photographed! We were lucky enough also to see a hybrid of *Op. aveyronensis* and *Op. sphegodes* before it was picked by a passing child − bless him! The afternoon on the hillside was a delight from the point of view of the flowers but the weather was challenging. Strong winds, sunny spells, rain, sleet, wet snow and finally a cracker of a thunderstorm that raged on for two hours.

The next day we intended to return to Lapanouse but first we went to investigate a site near Crassous. We waited for a heavy shower to pass and then headed out into the first field to investigate the tall purple spikes we had spied through the rain-soaked windscreen. The fields were so wet it was like trudging through marshland. As we suspected, the spikes were *O. militaris*, *O. purpurea* and several hybrids. They were magnificent. The fields beyond were carpeted with varieties of *Ophrys* and their hybrids – *Op. araneola* (mostly over), *Op. virescens*, *Op. incubacea*, *Op. caloptera*, and *Op. insectifera*. There were some very striking pink sepalled forms of *Op. virescens* that stood out among the others in the field. We found a single plant of *Op. lutea*. The only *Orchis* in evidence was *O. anthropophora* which was just coming into flower.

And so to Lapanouse once again. The weather was better in as much as it only rained! In the car park we found more *Op. aveyronensis* than we had spotted on our first visit but we were dismayed to see how many had been flattened by carelessly placed feet. Even in these miserable conditions the orchids were beautiful and we were pleased to see a good colony of *Op. aveyronensis* on the slope. As they were off the beaten track they had fared rather better than those in the car park, indeed it seemed that very few people had explored that area. The clusters of different orchids all the way up the hillside continued to delight us even on our fourth visit in two years. If it is going to grow anywhere, it is going to grow here, it seems, and in addition to those species seen

Fig.8 (above): *Ophrys virescens*
Fig.9: *Ophrys aymoninii* × *araneola*
Fig.10: *Ophrys araneola*
Fig.11: *Ophrys caloptera* × *lutea*
Fig.12: *Ophrys insectifera luteomarginata*
Photos by Hilary Pickersgill


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already we found *Cephalanthera damasonium* in bud, young shoots of *Listera ovata*, *Ophrys sulcata* and *Platanthera bifolia*. Our next quest was a site near Tiergues but in spite of good directions we did not find what we were looking for. It struck us that many fields were newly cultivated and perhaps that explained our failure to find the site.

Day 5 provided the one dry day before we headed south but the wind was a challenge again. Our first stop was a bank at the side of the road between La Pezade and Canals. We compiled a long list for this site but the only thing we had not seen before was a wonderful display of *Dactylorhiza sambucina*. The word 'abundant' seems to undersell this amazing population, looking so magnificent in perfect bloom. This was the only site where we found pure white specimens of *O. mascula*. Our next site was near La Couvertoirades. It had been mentioned by people we had met at other sites as a good place to see *Op. aymoninii* and its hybrids with other species and we were not disappointed. Our final site, close to Revens, was also recommended and was a great site for *O. anthropophora* and *O. simia* but the real stars were the dozen or so gorgeous hybrids of the two. What a way to end our five days. The sun was shining and it was warm enough to open the skylights and door back at the caravan.

We would like to thank members of HOS who helped us with site information and all those who have contributed to these records over the years. Special thanks to Alan Blackman for site information and specific orchid identification.

The pollination of European Orchids Part 3: *Limodorum* and *Epipactis*

Jean Claessens & Jacques Kleynen

In the second part of this series we treated the primitive orchid genera *Cypripedium* and *Cephalanthera*. In this article we introduce two further representatives of the primitive orchids. We will discuss the development of a specific organ intended for attaching the pollinia to a pollinator.

Limodorum

The representatives of the genus *Limodorum* are tall, slender plants, resembling an *Asparagus* when not in bloom. The flowers open wide or stay closed, depending on the climatic conditions or the pollination mode; allogamous or autogamous. Open flowers are attractive − the lateral sepals are spread and the bipartite lip is horizontal, providing a good landing place for visiting insects (Fig. 1). The long, downward curved spur contains copious nectar. The long column is bent over the lip and on its ventral side is a large, triangular-rounded stigma, glistening with stigmatic fluid. On the flattened top of the column lie the pollinia, covered by the hinged anther cap. In the genus *Cephalanthera* we saw that the pollinia are transported by means of the stigmatic fluid, gluing the pollinia to the back of the pollinator. In the genus *Limodorum* pollinia are attached to the pollinator by means of a specific structure.

The stigma of most European orchid genera consists of three parts, a condition best viewed in young flowers, when the stigma is not yet covered with stigmatic fluid. In *Limodorum* (Fig. 2), part of the stigma is converted into the rostellum, a tissue that can form a viscid structure, termed the viscidium, for attaching the pollinia to the pollinator. The viscidium is a rounded, whitish convex structure at the upper rim of the stigma. It consists of viscid fluid covered by a thin membrane. When an insect visitor of L. *abortivum* (Violet Limodore**)** lands on the lip the protruding, hinged part bends downwards, forcing the visitor to crawl further forward in order to reach the nectar in the spur (Fig. 3). Thus, the pressure on the lip is reduced and it swings up into its original position. The chance is high that the visitor pushes against the viscidium. The covering membrane ruptures and the pollinia are glued to the insect's

Fig.1 : *Limodorum abortivum,* La Bouverie, France, 4th May 2009
Fig.2: Column of *Limodorum abortivum*
[A=anther, P=pollinia, V=viscidium, S=stigma]
Fig.3: *Limodorum abortivum* with an *Anthophora* bee that has landed on the lip, searching for nectar. La Bouverie, France, 4th May 2009
Fig.4: The flower of *Limodorum abortivum* is well adapted to its pollinator, *Anthophora biciliata*, which has pollinia attached to its back. The pollinia are in the exact position for touching the stigma. La Bouverie, France, 7th May 2008


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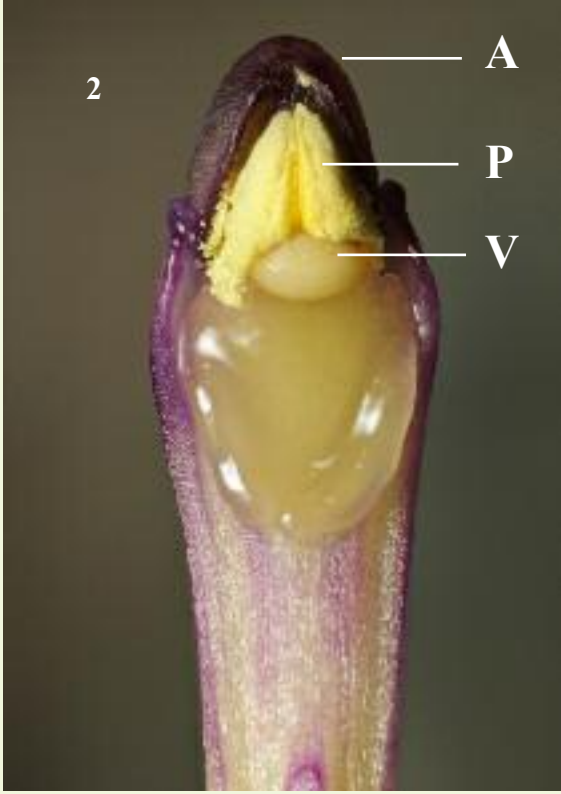
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back (Fig. 4). Due to the retreating movement of the insect, the hinged anther lifts, freeing the pollinia, and they can be transported to another flower. Main pollinators are male *Anthophora* bees, which include the plants of *L. abortivum* in their patrol routes. While flying around checking if there are any females available, they land now and then on the orchid and search for nectar. Many of the males we have observed already had pollinia glued to their back. The visiting frequencies seem to be specific for a locality, as in other nearby populations we saw no pollinators patrolling or visiting the flowers. Other reported pollinators are *Bombus terrestris* (Fig. 5), *Anthidium septemdentatum* (Fig. 6) and *Lasioglossum* sp. (Claessens & Kleynen 2011). During either cold, rainy or very hot periods the flowers hardly open or can stay completely closed. In that case, the flowers of *Limodorum abortivum* can auto-pollinate. The pollinia are rather friable and can lose coherence, so that the pollen grains, united in packages of four, can pass the viscidium and contact the stigmatic surface.

In its sister species *Limodorum trabutianum* (Fig. 7) autogamy is the rule. The stigma is situated right under the anther and is perpendicular to the axis of the column. When the anther is mature and dehisces the pollinia fall directly onto the underlying stigma. There is a viscidium, but this is covered by a tongue-shaped outgrowth of the column, blocking the passage to the viscidium.

Epipactis

The genus *Epipactis* comprises allogamous, autogamous as well as transitional species. The structure of the stigma and the viscidium plays an important role in the pollination mode. We will take *Epipactis helleborine* (Broad-leaved Helleborine) as an example to illustrate the construction of an *Epipactis* flower (Fig. 8). The flower perianth is bell-shaped and has a bipartite lip with a more or

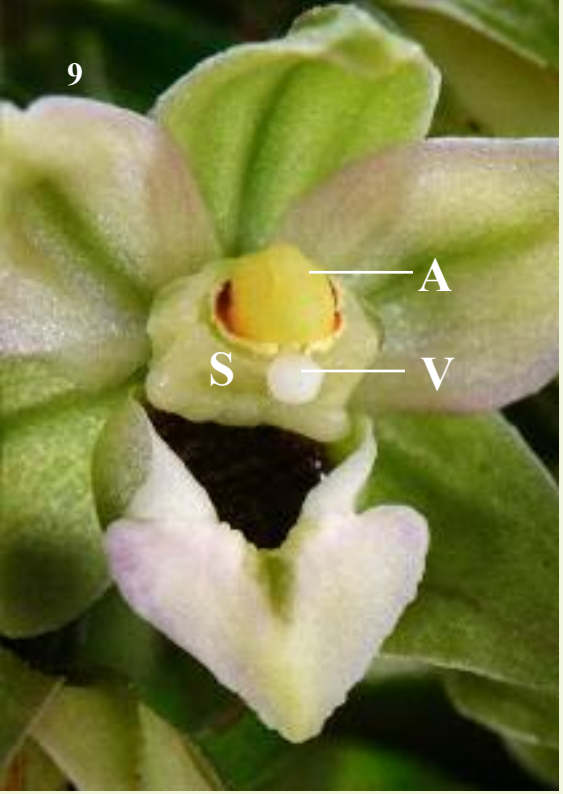
Fig.5 : A bumblebee (*Bombus terrestris*) searching for nectar. The articulated lip bends down under its weight. La Bouverie (F), 6th May 2009
Fig.6: *Anthidium septemdentatum* landing on the lip of *Limodorum abortivum.* La Bouverie, France, 4th May 2006
Fig.7 (above): Flower of *Limodorum trabutianum* with a sepaloid lip and a ventral outgrowth covering up the stigma.

less triangular part that serves as a landing place for insects (the epichile), and a basal, cup shaped part where nectar is secreted (the hypochile). The column is horizontal; the large, concave, quadrangular stigma is placed on the underside. The top of the column is concave, forming a pollen bed in which the pollinia are deposited when the anther is ripe. On the protruding part of the column sits a rounded structure, the viscidium (Fig. 9). As in *Limodorum*, it consists of sticky fluid, covered by a thin membrane. When the flower opens, the viscidium is already connected to the pollinia. The viscidium has a double function. It glues pollinia to the pollinator and prevents pollinia from sliding out of the anther and contacting the stigmatic surface.

Wasps almost exclusively visit and pollinate *E. helleborine* (Figs. 10 & 11). Wasps often visit rotting fruit and after crawling over the fruit they can transport yeast bacteria from the fruit to the *Epipactis* plants. The nectar is infected with the yeast and starts fermenting, producing small quantities of alcohol. This attracts the bees and makes them more sluggish, extending the time they spend on the *Epipactis* plants (see a video at http://www.youtube.com/watch?v=GIbB2_MUFs8). Due to this phenomenon the fruit set of *E. helleborine* is quite high. Other species that depend on insect visitors for their pollination include *E. atrorubens* (Dark-red Helleborine) and *E. purpurata* (Violet Helleborine).

In *E. palustris* (Marsh Helleborine, Back Cover Photograph), we can observe both allogamous and autogamous pollination. The conspicuous flowers produce large amounts of nectar in the hypochile and are pollinated by a wide range of insects (see Wilcox 2010). In order to enable autogamy the pollinia must be able to contact the stigma. The pollinia stick out beyond the point of attachment to the viscidium and cohere well in young flowers (Fig. 12). However, if a flower gets older and is not yet pollinated, the pollinia lose cohesion and pollen packages can reach the stigma below the tips of the pollinia.

Fig.8 (above): *Epipactis helleborine*, Geulle, The Netherlands, 26th July 2011
Fig.9: *E. helleborine* close-up [A=anther, V=globular viscidium, S=stigma]
Fig.10: Wasp presses pollinia, attached to its head, firmly against the stigmatic surface while drinking nectar, Geulle, The Netherlands, 5th August 2013
Fig.11: Wasp drinking nectar from the hypochile, Geulle, The Netherlands, 5th August 2013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The cohesion of the pollinia, the functionality of the viscidium and the form of the stigma determine the pollination mode of the various species. In recent orchid literature, there is a torrent of new "species", many of which are autogamous taxa. They all show pollinia that easily fall apart, a viscidium that is either ineffective, has shrunk or has completely disappeared and a stigma that is reduced. Instead of forming a broad platform for the pollinia, there is only a small, triangular pollen bed left so that the pollinia can easily contact the stigma (Fig. 13). Examples of autogamous species are *E. leptochila* (Narrow-lipped Helleborine) or *E. microphylla* (Small-leaved Helleborine). Autogamy enables those species to occupy forests with few or hardly any insect visitors.

In *Epipactis muelleri* (Mueller's Epipactis), the pollen bed has almost completely disappeared. When the anther dehisces the pollinia fall directly onto the underlying stigma (Fig. 14). Because of the lack of a viscidium, transport of the pollinia is impossible. Hybrids can occur if the pollinia of an allogamous species are deposited on the stigma of *E. muelleri*.

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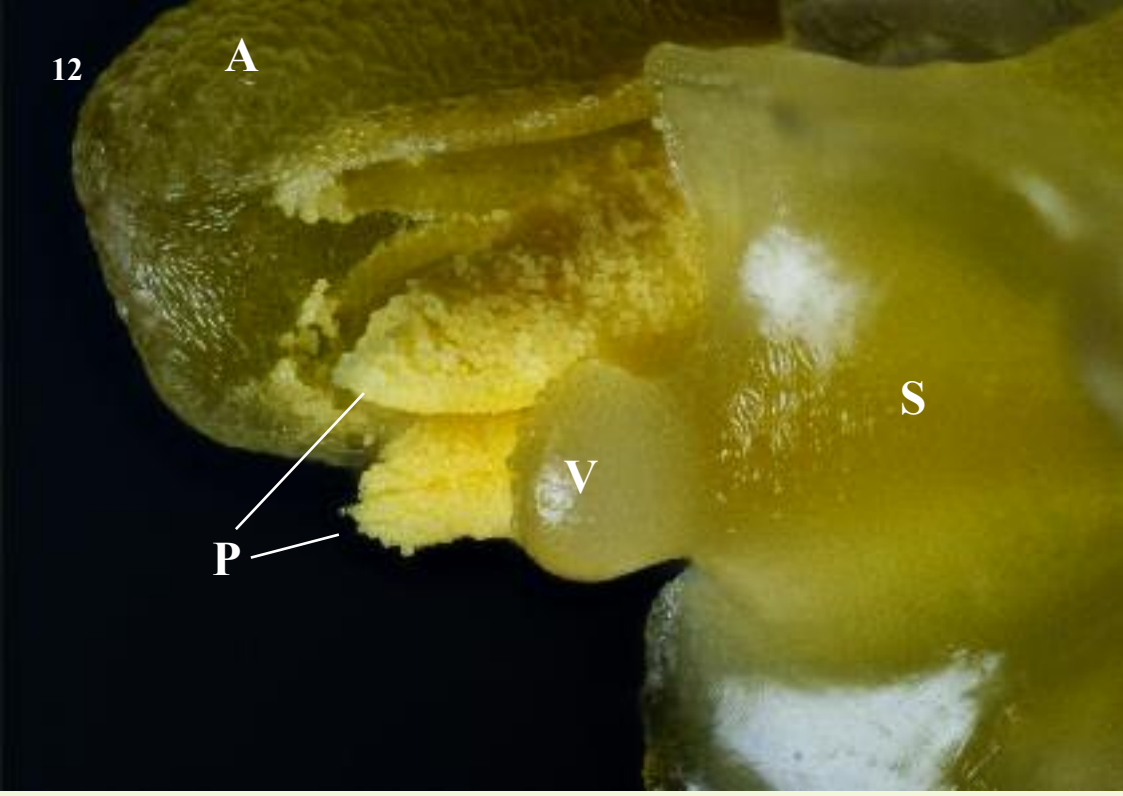
Fig.12 : Part of the *Epipactis palustris* column, seen from below. The pollinia exceed the upper rim of the stigma and have a rather loose structure. [A=anther, P=pollinia, V=globose viscidium, S=stigma]
Fig.13: *Epipactis leptochila* column showing the reduced stigma allowing the pollinia to contact the stigmatic surface. The pollinia are powdery, easily falling apart and the viscidium is ineffective. [A=anther, V=viscidium, S=stigma]
Fig.14: Longitudinal section of an *Epipactis muelleri* bud showing the column. The pollinia have fallen out of the anther directly onto the underlying stigmatic surface.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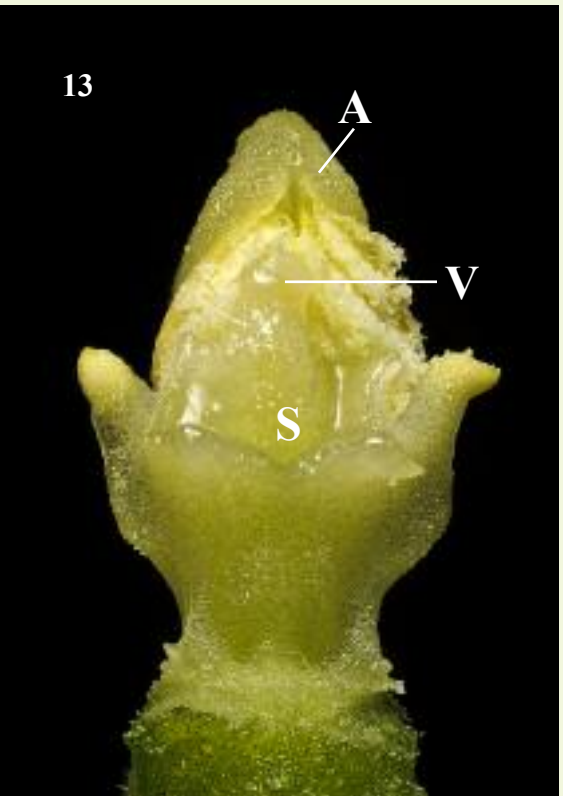
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