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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, January 2004 Journal or contact the Editor).

www.hardyorchidsociety.org.uk

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Front Cover Photograph

Ophrys philippei photographed by Robert Thompson in Begentier, France, (article on page 111).

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Editorial Note

I hope that you enjoy the 36 page October Journal, which carries articles from several of our regular contributors. We rely heavily on a relatively small number of active members to maintain the quality of articles, and they do a great job for the Society. The Journal would also benefit from additional new contributors, and I am sure that many of you have interesting experiences and observations that would be worthy of sharing with other members. Articles can be botanically significant contributions, information on cultivation, reports of visits or interesting observations. We have an informal Editorial Board, who are very happy to help get material ready for publication. Please contact the Editor (moorend@globalnet.co.uk) if you have a potential contribution. A big thank you to everyone who returned Maren Talbot's questionnaire! The information is being used and feedback will be given in the next Journal. Lastly, a reminder that we have back issues of the Journal for sale. They contain a wealth of useful information and can be obtained from Barry Tattersall (details in the July 2005 Journal).

The HOS Autumn Meeting

Sunday 13th November 2005

This year we are returning to The RHS Gardens at Wisley for our Autumn Meeting and Photographic Show. Advance booking is essential - a Booking Form with full details of the cost and location is included with this Journal. Please return it with your cheque to Maren Talbot (Membership Secretary) by 1st November.

The provisional programme for the day is as follows (details may change):

8:30	Set up Trade and Members’ Plant Sale Tables
9:30	Doors Open; Tea/Coffee; Photo Show Entries; Plant Sales Start
10:30	Meeting Opens: Chairman’s Introduction
10:35	Sidney Clarke *“Photographing Britain’s Orchids”*
11:35	*“Comfort Break”*
11:45	Tony Hughes *“Orchid Pollination”*
12:45	Lunch
14:00	Judge’s Review of the Photo Competition
14:30	Maren Talbot *“Pleione Culture”*
15:00	10 minute *“Comfort Break”*
15:10	Alan Kindred *“Disas in the Wild and in Cultivation”*
16:15	Open Discussion, followed by Tea / Coffee
17:00	Meeting Ends / Garden Closes

HOS Photographic Competition 2005

Eric & Doreen Webster

The HOS 2005 Photographic Competition will be held during the HOS Autumn meeting at RHS Wisley on Sunday 13th November. The winning entries will appear on the web site and some will be published in the HOS Journal. Although advance entry is not essential, it would be help the organisers if as many entries as possible were made in advance of the meeting. This can be done by telephoning Doreen Webster on 0771 3409743 or by email to *dozzer@lobro24.freeserve.co.uk*. If you cannot attend the meeting, but wish to make an entry, photographs can be sent to Barry Tattersall, 262, Staines Road, Twickenham, TW2 5AR.

Please remember that entrants are restricted to one slide in each of Classes 9 to 12 and three prints (photographic or digital) in each of Classes 1 to 8. Please label entries as described in the Rules. Entered photographs must not have been shown in earlier HOS Competitions, but previously shown photographs are welcome for inclusion in a non-competitive display, which is always appreciated by members. Entries on the day should be brought between 9.30 am and 10.30 am.

Rules

1. Judging will be based on the quality of the pictures, not on the rarity of the plants.
2. Plants may be wild or cultivated, though only *“hardy”* plants are acceptable.
3. Prints must be un-mounted so that they can be inserted in plastic pouches for protection when on display.

4. You may enter up to **three prints** in each of classes 1 to 8, but may receive only **one award** per class.

5. You may enter only **one slide** in each of classes 9 to 12.

6. Pictures entered previously in HOS competitions are **not** permitted.

7. Prints should have a **small note with them of what the plant is** and any information of interest to other members, but your name must appear only on the reverse side of the print.

8. When a class states *"***close-up***"*, the photograph should include only part of a plant. This would normally be the flowering part, but may be another detail of interest.

9. When a class states *"***a single orchid plant***"*, the picture should consist of the whole of a single plant which may be multi-stemmed.

10. Slides should be labelled with your name (the judge will not be seeing the actual slide out of the projector!) and with an alignment dot on the **bottom left corner** of the mount (when viewed the right way up). Any standard slide mount is acceptable.

Classes

1. An orchidaceous landscape, print size up to 7x5 inches.
2. A group of orchids, print size up to 7x5 inches.
3. A single orchid plant, print size up to 7x5 inches (see Rule 10).
4. A close-up, print size up to 7x5 inches (see Rule 9).
5. An orchidaceous landscape, print size up to A4.
6. A group of orchids, print size up to A4.
7. A single plant, print size up to A4 (see Rule 10).
8. A close-up print size up to A4 (see Rule 9).
9. An orchidaceous landscape, 35mm colour slide.
10. A group of orchids, 35mm colour slide.
11. A single orchid plant, 35mm colour slide (see Rule 10).
12. A close-up, 35mm colour slide (see Rule 9).

Looking Ahead

Tony Hughes

Next year's AGM may seem a long time ahead, but as Chairman I am getting slightly worried already! The problem is that three of our Officers (Rosemary Hill as Treasurer, Maren Talbot as Membership Secretary, and Chris Birchall as General Secretary) will all complete their three years in office and will have to be replaced. Before I have to go round twisting arms, I'd love to know if there are a few members who would like to volunteer for one of these posts, or perhaps would be prepared to join the Committee as an Ordinary Member.

I am sure that few people will believe me, but our 3 Committee Meetings per year are quite good fun - far more is talked about than just HOS business, you get to meet some very interesting people and you have an excellent lunch! If you are curious but unsure, you would be welcome to sit in on a meeting and see at first hand what happens.

Bill Temple (bill@wtemple.f9.co.uk) is interested in obtaining seed of native *Spiranthes spiralis* if any members have some growing in their lawns. Please contact Bill if you can help.

HOS Field Trip to South Cumbria on 25th June 2005

Alan Gendle

A group of 15 HOS members assembled just off the M6 motorway at the Junction 38 café car park, a convenient meeting point at the foot of Shap Fell. The weather was bright and dry, and remained so for the rest of the day. Unfortunately, our original itinery had to be changed, because the site of the hybrid between Northern Marsh Orchid and Heath Fragrant Orchid had been destroyed by vehicles doing 360º turns in the road.

The party headed north through the village of Orton to a roadside site where stone had been quarried years ago. Behind a large erratic at the side of the road was an example of the large, "longibracteatum" variety of the Frog Orchid (*Dactylorhiza viride*). Normal Frog Orchids were flowering in the surrounding grassy area. A group of Heath Fragrant Orchids (*Gymnadenia borealis*) attracted the attention of the photographers, and lots of Common Twayblades (*Listera ovata*) were present in the long grass.

Returning south through Orton, we turned south east into an area of lanes, that years ago were cattle drove roads. These lanes are 20 metres wide, with species rich verges. We stopped and photographed Common Twayblade (*Listera ovata*), Northern Marsh Orchid (*Dactylorhiza purpurella*), Common Spotted Orchid, (*Dactylorhiza fuchsii*), and hybrids between these last two.

Our next stop provided a completely different habitat from the previous sites. We stopped in the Tarn Sike, and met up with 2 late comers to the party. The area consists of moorland overlying carboniferous limestone. A small beck known as Tarn Sike has scoured away the moorland to produce an area of calcareous bog. The lovely Birds Eye Primrose dominates the ground flora. First we explored the south side of the bog to see Northern Marsh Orchid (*Dactylorhiza purpurella*), the normal Early Marsh Orchid (*Dactylorhiza incarnata* ssp. *incarnata*), and the purple subspecies (*Dactylorhiza incarnata* ssp. *pulchella*) in an area where there is little hybridisation.

After crossing the road, we ventured north into the more interesting area. Here, we came across lots of Northern Marsh Orchid x Early Marsh Orchid hybrids, that were a lovely salmon pink colour. On a grassy slope, lots of Heath Fragrant Orchids (*Gymnadenia borealis*) were in flower. Unfortunately, two other hybrids which we had hope to see, Heath Fragrant Orchid x Northern Marsh Orchid and Heath Fragrant Orchid x Early Marsh Orchid, decided not to flower this year.

Next we moved on to an area of open wet grassland by the hamlet of Little Asby. The site is officially known as Little Asby Inrakes and Outrakes. It is an SSSI, and the site of the largest population of Small White Orchid (*Leucorchis albida*) in Cumbria.. Only four plants were found in flower, last year nine flowered. A combination of a late spring frost and cattle browsing had reduced the numbers. Touring across the area we found large numbers of Heath Spotted Orchid (*Dactylorhiza maculata*), more Northern Marsh Orchids and Heath Fragrant Orchids. Hybrids between Heath Spotted Orchid (*Dactylorhiza maculata*) and Northern Marsh Orchid (*Dactylorhiza purpurella*) were found in some of the damp hollows.

After lunching at Little Asby we moved on to the Cumbria Wildlife Trust *"*Waitby Greenriggs Reserve*"*, where Alan Gendle is the honorary reserve manager. The reserve consists of two derelict railway lines cut through carboniferous limestone. On entering the reserve, about forty Fly Orchids (*Ophrys insectifera*) were observed on the steep stony bankside. Walking through the reserve we again saw Northern Marsh Orchid, Common Spotted Orchid and Frog Orchid.

A few Common Fragrant Orchids (*Gymnadenia conopsea*) and Marsh Fragrant Orchid (*Gymnadenia densiflora*) were starting to flower. One hybrid between Common Spotted Orchid (*Dactylorhiza fuchsii*) and Common Fragrant Orchid (*Gymnadenia conopsea*) was found on a bankside. Also, the white *"alba"* varieties of both Fragrant Orchids were seen. Finally, a few spikes of Marsh Helleborine (*Epipactis palustris*) were found in flower in amongst the thousands in bud.

Many thanks to the members who generously gave to a collection shared between the HOS and the Cumbria Wildlife Trust.

Hybrid between *Dactylorhiza maculata* and *D. purpurella*
Photo by David Hughes

Circumscribing and Interpreting Closely Related Orchid Species
Richard Bateman's talk at Kidlington

Introduction
This account builds upon previous presentations and articles produced for HOS by using a range of morphology and DNA-based techniques to explore three case-studies. First, I update a previous presentation on our understanding of the origin(s) of the tetraploid marsh-orchids (Bateman, 2004, 2005), arguably the most troublesome group within *Dactylorhiza*. Secondly, I explore the species boundary between Britain's two native species of *Platanthera.* Thirdly, I review our knowledge of the critical role played by morphologically expressed mutations in the origination of orchid species, drawing on examples of naturally-occurring mutants supplied by amateur orchidologists across Europe.

All three studies rely on combining morphological and DNA-based analytical approaches. They also re-emphasise the importance of distinguishing between a "lateral" view of evolution, focusing on the relative times of divergence of pre-determined species, and a "vertical" view of evolution, which concentrates on comparing individual plants that can be assigned to populations that can in turn be assigned to infraspecific taxa or species. The population-level method is a more time-consuming, but also often a more rewarding, approach to determining the optimal boundaries separating orchid species.

Dactylorhiza
It has been suspected for more than half a century that the more complex and troublesome dactylorchids were allopolyploids; that is to say that they originated by a hybridisation event between two species with a "normal" diploid number of 40 chromosomes that was immediately followed by duplication of all the chromosomes to generate what is known as a tetraploid with 80 chromosomes. Heslop-Harrison (e.g. 1954) even went as far as to guess which diploid parents were most likely to have given rise to the morass of tetraploids commonly known as the *D. majalis* aggregate, citing *D. fuchsii s.l.* and *D. incarnata s.l.* as the likely culprits. He knew that these species are morphologically divergent and have distinct ecological preferences. We have


Figure 1. *Dactylorhiza occidentalis*
Photo by Derek Turner Ettlinger

Figure 2. *D. maculata* the mother of *Dactylorhiza occidentalis* Photo by Richard Bateman

Figure 3. *D. incarnata* the father of *Dactylorhiza occidentalis* Photo by Richard Bateman

since demonstrated that they are evolutionarily divergent, exhibiting considerable differences in their DNA (Bateman *et al.* 2003). In addition, Heslop-Harrison speculated that the most notable exception to this origin was *D. maculata s.s.*, which he suspected had evolved from *D. fuchsii* alone, by means of chromosome doubling in the absence of hybridisation. At the turn of the century, I (e.g. Bateman, 2001) and others (e.g. Pedersen, 1998; Hedrén *et al.*, 2001) raised several further pertinent questions: Could we use modern molecular methods not only to test Heslop-Harrison's speculations on polyploidy origins but also (a) to determine how many times *D. majalis*-type taxa had evolved from the presumed parents and (b) to ascertain which diploid species had yielded the mother (seed parent) and which had yielded the father (pollen parent) of those new species.

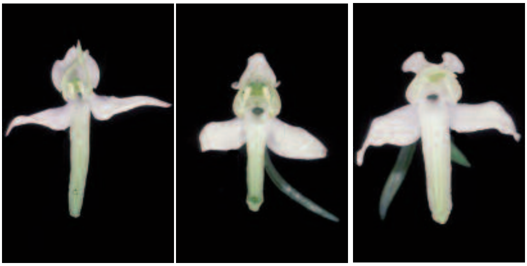
In order to answer these questions I joined forces with researchers operating in several systematics laboratories, most notably the Jodrell Laboratory at Kew. This allowed us to sample large numbers of plants from across Europe (aided by HOS members). We then subjected those plants to detailed examination of selected genes from both their nuclear chromosomes (inherited equally from both parents) and their extra-nuclear chloroplasts (inherited only from the mother) (Pillon *et al.*, 2006). This shows that most of the widely recognised tetraploid species, such as *D. majalis s.s.*, *D. praetermissa* and *D. purpurella*, did indeed originate through polyploidy events between *D. incarnata* and *D. fuchsii*-like plants. Moreover, most of the polyploids had separate origins, and some individual named "species" had multiple origins. The most notable example is *“D. traunsteineri”*, which originated separately in at least three areas: the Alps (its type area), Scandinavia and the British Isles. By exploring in detail the degree of genetic variation evident within such individual plants and populations we can estimate roughly how long ago the hybridisation event that led to the evolution of the new species took place. This technique demonstrated that tetraploids in southern Europe are on average substantially older than those occurring in northwest Europe, the most recent of which are thought to have originated *in situ* since the last glaciation (Pillon *et al*., 2006).

In addition, linking the outward appearance of these plants to their genetic fingerprints from both nucleus and chloroplasts has allowed us to identify their parentage with some precision. To give three representative examples, the much-discussed *D. purpurella* ssp. *cambrensis* (syn. *majaliformis*) most likely had *D. fuchsii* var. *fuchsii* as its mother and *D. incarnata* ssp. *pulchella* as its father. As shown in Figures 1–3, the exclusively Irish *D. occidentalis* had as its father *D. incarnata* and as its mother *D. maculata* (this would have surprised Heslop-Harrison, as *D. maculata* is a tetraploid rather than a diploid and so is an unlikely parent of another tetraploid). Both of these allotetraploids probably originated in the British Isles following the last glaciation, *D. occidentalis* remaining in Ireland but *D. purpurella* spreading throughout northern England, Scotland and Wales. In contrast, another species, *D. ebudensis* (syn. *scotica*), has remained confined to the Outer Hebridean island of North Uist. This likely had as its parents two taxa with which it co-occurs in its chosen dune-slacks: *D. incarnata* ssp. *coccinea* as its mother and *D. fuchsii* ssp. *hebridensis* as its father. One consequence of these studies is to wholly undermine the distribution map purporting to show *“D. majalis”* in the recent plant atlas of the British Isles (Preston *et al*., 2002), which confuses three dactylorchid species that had separate evolutionary origins (*D. occidentalis*, *D. purpurella* ssp. *cambrensis* and *D. ebudensis*: Bateman, 2005). To add insult to injury, none of the three actually belongs in *D. majalis s.s.*!

Although these conclusions have already startled many orchid enthusiasts, much confidence can be gained from the fact that they reflect a range of different techniques that have now been applied to the problems, as well as an increasingly thorough sampling of populations by several researchers who are carefully coordinating their activities. Thus, even more detailed questions can now be asked. For example, if, as we have seen, *“D. traunsterineri”* can have independent origins in the Alps, Scandinavia and the British Isles, could different clusters of populations previously assigned to this supposed species *within* the British Isles also have separate origins? (I for one have always had trouble reconciling plants in southern and eastern England with those occurring further north and west). Also, can we now trace the migration routes of selected allopolyploid species from their point of origin northwards, presumably in response to amelioration of the post-glacial climate? And, above all, could we actually witness a speciation event in nature, of the kind that clearly occurred so recently on North Uist to give rise to *D. ebudensis*? As always in science, two new questions are raised for each question that is satisfactorily answered.

Platanthera

Our species of *Dactylorhiza* have always been bones of contention but, in contrast, the two British species of *Platanthera* have been accepted without serious challenge for at least 150 years, having been studied in detail by Darwin (e.g. 1862). They can easily be distinguished by two characters that are assumed to have strong adaptive significance in determining the precise identity of their pollinators (nocturnal moths). Specifically, the spur entrance of *P. chlorantha* is much wider than that of *P. bifolia*, and the adhesive viscidial discs at the base of its pollinaria are held much further apart, so that its pollinaria converge upwards, rather than lying in parallel as they do in *P. bifolia* (Figures 4, 5). Current phylogenetic evidence suggests that *P. chlorantha* evolved from within *P. bifolia.*


Figures 4–6. Flowers of *Platanthera bifolia* (left), *P. chlorantha* (right) and a possible hybrid (centre) from a locality in Oxfordshire (Photos: Richard Bateman; all at the same scale).

Yet, when you examine the two species in detail, their similarities are more striking than their differences. They have similar distributions across Europe and Asia that are echoed at a smaller scale within the British Isles, where they also show similar flowering times and considerable overlap in ecological preferences (admittedly, some races of *P. bifolia* are able to tolerate more acidic conditions than *P. chlorantha*). Detailed morphometric study (R Bateman, P Rudall & K James, in prep.) has shown that *P. bifolia* is typically two-thirds the size of *P. chlorantha* in most of its features. The major deviations from this general trend are (as expected) the column dimensions and spur width long used to distinguish the two species; in these few characters *P. bifolia* is typically 25–50% the size of *P. chlorantha*.

However, once again, the story is not quite as simple as it first appears. An elegant set of studies by Darwin (1862) and later by Nilsson and co-workers (e.g. Nilsson, 1983) generated a compelling adaptive scenario to explain the divergence in column and spur dimensions between the two species of *Platanthera*. They credibly argued that pollinaria can only be attached to the proboscis or eyes of a moth, and the remaining areas of the head are covered in loose waxy plates. The closely juxtaposed viscidia of *P. bifolia* mean that its pollen masses are most readily attached to the proboscis of a visiting moth, whereas the more widely separated viscidia of *P. chlorantha* are best fitted for attachment to the moth's eyes. However, in order to attach the pollinaria to the eyes, the moth must be encouraged to press its face into the column, and this is most effectively achieved by elongating the already long spur to the point where the moth is forced to stretch for the enclosed nectar. Our morphometric survey showed that this is indeed the case in southern England, where the average spur lengths of *P. bifolia* and *P. chlorantha* are 19 mm and 34 mm, respectively. However, Nilsson's (1983) data reveal the opposite pattern in Sweden, where *P. bifolia* averages 40 mm and *P. chlorantha* averages a modest 25 mm (a figure close to the 27 mm reported for this species in southern Scotland: Sexton & McQueen, 2005). Clearly, the classic adaptive story requires further refinement if it is to match the available data.

Even more startling were the results of DNA-based analyses (Bateman *et al.*, in prep.). Sequencing of nine rapidly mutating regions of both the nucleus and chloroplasts revealed only one genetic difference across approximately 10,000 bases – less than the average difference separating two individual humans. Moreover, the single difference that was detected did not diagnose either species. This means that we do not yet have a reliable genetic fingerprint for either of these species, and so we cannot yet test whether putative hybrids between them, initially identified on morphological grounds (e.g. Figure 6), are *bona fide*. However, the longer term potential of researching these species is great; when we finally do locate reliable genetic differences separating them (probably very few in number), there is a much greater chance that, instead of being random genetic differences, they will be the ones that are actually responsible for the differences in appearance of the species. As in all walks of life, science involves both swings and roundabouts.

The critical role of mutation

Although they vary considerably, the spur lengths of *Platanthera* species within populations do at least form neat bell-shaped curves, indicating that they are controlled by several genes that each has a modest effect on the shape and/or size of the spur. In other words, they conform to what has become the traditional "neoDarwinian" view of evolution. However, the evolutionary relationships within *Gymnadenia s.l.* (including the former *Nigritella*) show repeated alternation between long-spurred species (the majority) and short-spurred species (e.g. *G. odoratissima*, *G. frivaldii*, the former *Nigritella* species). Even more interestingly, populations of the long-spurred species contain a minority of individuals that possess much shorter spurs. This pattern demonstrates that, in this genus at least, spur length can vary discontinuously rather than continuously; it is therefore probably subject to one or more higher level "master genes". This and other similar observations open the way for interpretations of orchid evolution that rely not on gradual, subtle shifts in appearance but rather large, instantaneous shifts in appearance. These could, for example, immediately lead to relationships with new pollinators and thereby effectively isolate the innovative new plants from their tediously conservative parents.

With the generous assistance of HOS members, I have been able to amass a remarkable panoply of images comparing "normal", wild-type floral morphologies of orchids with various kinds of mutant found in nature (e.g. Bateman & Rudall, 2005). Here, courtesy of Hans Reinhard and Peter Peisl, I have reproduced just one such example; a flower of *Ophrys insectifera* containing many perianth segments (most notably labella) that are arranged in a clockwise spiral and progressively diminish in size from the base to the apex of the flower (Figure 7). Admittedly, this particularly grotesque example is extremely unlikely to succeed in establishing a new evolutionary lineage. Rather, I have included it partly because it adds a new dimension to the fascinating range of morphological variation in *O. insectifera* illustrated by Lewis (2005) in the previous issue of *JHOS*, and partly because it demonstrates rather eloquently one aspect of what makes a flower a flower, namely determinacy. It is determinacy in the floral primordium (effectively the "embryonic" flower) that restricts an orchid flower to six well-differentiated, functional tepals. If that primordium loses determinacy it behaves instead like the apex of a shoot, generating many tepal-like structures that decrease in size, mirroring the appearance of leaves up the stem of a typical terrestrial orchid.

Figure 7. Mutant flower of *Ophrys insectifera* that shows indeterminate development (Photo: Hans Reinhard)

Clearly, very small genetic changes can have disproportionately large effects on the appearance of the affected plant. Most notably, a Taiwanese research group has successfully untangled the genetics underpinning the occurrence of peloric *Phalaenopsis* orchids that possess not just one but three labella (Tsai *et al.*, 2004). This novel category of research (termed "evo-devo") is opening the way for a potential flood of studies that reveal exactly how the orchid flower develops and evolves. My prediction is that a wide range of speciation mechanisms will prove to have contributed to today's remarkable diversity of orchids.

Although conducting such high-tech research lies beyond the reach of most HOS members, another related line of exploration is ideally suited to the HOS. Specifically, in a political environment where pragmatism and flexibility increasingly hold sway, the research councils that increasingly dictate the kind of research conducted by professional scientists will no longer fund long-term, field-based research. Yet it is exactly this kind of research that is needed to demonstrate what happens to mutant orchids in nature, rather than in the unnaturally stable environment of an experimental glasshouse. Classic evolutionary theory states that unfit individuals will subsequently be eliminated from the natural environment, either because they are unable to grow and/or reproduce in that environment or because they will be out-competed by co-occurring "normal" plants that are assumed to be fitter. In my opinion, the best way to demonstrate whether evolutionary novelties occasionally succeed in the wild is to monitor them carefully, on an annual basis, and thus to observe how they perform through many years of vicissitudes. Here is an area where the sharp eyes and patience of HOS members could be deployed to particular advantage.

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Liguria & South East France

Mike J Parsons

Together with Robert Thompson and John Spencer, I arranged a visit to Liguria in Italy, and the Var and Vercors regions of France. The trip was arranged for 12th to 22nd May 2004, so as to coincide with the best flowering times for the orchids in these areas. Our timing proved to be spot on, and we saw many species in full bloom, including the rarities on our "hit list". These included *Orchis patens, Orchis ligustica, Ophrys majellensis, Ophrys philippei* and *Himantoglossum adriaticum.* All these orchids were new to us, but we also got to see many "old friends". Sadly, we were too early to see *Cypripedium* in bloom. Normally, there would be a few out at the time of our visit, but a late spring put paid to that. During the whole of our trip, the weather was outstanding with only a small amount of rain on the first two days. This was welcome, since the tracks in the mountains can be slippery, and there is little in the way of cover on the open slopes.


Orchis patens
photo by Robert Thompson

We arranged an early morning flight with Ryanair, from Stansted to Genoa in Liguria. This was ideal for us, since the flight was relatively cheap, and enabled us to be "orchiding" later the same day. We quickly found suitable accommodation in the form of the "Prima Sole" hotel at Leivi and, after a brief drive along the coastal autostrada, we headed for the hills at Chiavari. We were soon in the field armed with a long list of recommended sites. A massive *O. ligustica* flagged us down and, in an olive grove and terracing beside the road, we found both *O. ligustica* and *O. patens*, and also *Serapias neglecta*. The presence of *Serapias* was a pleasant surprise. The orchid is quite distinctive with its low stature and large, lightly coloured lip. We combed the area for other sites and saw *Cephalanthera longifolia, Anacamptis (Orchis) morio, Dactylorhiza fuchsii, Orchis mascula, Orchis provincialis* and *Serapias lingua*, before the rain forced us back to base.

On our second day (13th May), we used the autostrada to get to Capreno, where a sloping meadow yielded more *O. patens*. This orchid is an elegant relative of *O. spitzelli*. It is more lightly coloured than *O. spitzelli,* with a less deflexed lip and with fewer, but more prominent spots on its ear-like sepals. Again, we found *O. ligustica*, which is thought to be of *O. mascula* and *O. patens* hybrid origin. We failed to see *O. ligustica* and *O. mascula* flowering together, suggesting that the latter may have been bred out. At the edge of the meadow I found what I believe to be the dead spike of *Ophrys tyrrhena*. Other orchids here were: *A. morio, D. fuchsii, O. provincialis, Op. apifera, S. lingua* and, nearby, one *Serapias cordigera.*

Orchis ligustica
photo by John Spencer

The next day (14th May), we were back in the Ligurian Hills visiting a site on Mt Becco. On the climb up from the car park, we quickly found *Ophrys aurelia*, a large flowered orchid belonging to the *Op. bertolonii* group. *Neotinea (Orchis) tridendata* was just emerging here and we also saw *A. morio, C. longifolia, Op. sphegodes, O. mascula, O. provincialis* and *S. lingua.* After exhausting this site, we took the autostrada west in the direction of Toirano and then turned for the hills. On a sweeping bend, we located a known site for *Op. majellensis*. This is a late flowering member of the Early Spider Orchids, if you can excuse the oxymoron. Our quarry took some time to find, and it was growing on a steep slope above a

Serapias neglecta
photo by John Spencer

Orchis patens
photo by John Spencer

Ophrys majellensis
photo by John Spencer

stream. During the search we found *Op. aurelia* in various shapes and sizes. Some plants had *Op. saratoi* features and appeared to be intermediates between these two closely related species. Other orchids in this area were: *A. morio, A. papilonacea, N. tridentata, Op. fuciflora, Op. scolopax* and *S. lingua.* On the drive back to our hotel on the coast, we spotted a solitary *Orchis militaris* (we had never seen one in Italy before) growing with *Op. incubacea* and *D. fuchsii.*

On the next morning (15th May), the autostrada took us to Imperia, and we headed north to old terraces near Dolcedo in an effort to locate more *Op. majellensis*. Here again it took some time to locate pure plants, since the presence of *Op. fuciflora* and *Op. incubacea* had generated a number of hybrids. Some plants looked very much like *Op. arachnitiformis* - another orchid thought to be of hybrid origin. Other orchids here were: *A. morio, A. papilonacea, A. pyramidalis, H. robertianum* and some emerging *S. vomeracea.*

After a good morning in the hot sun, we were on our way to France. We headed for the Toulon area in an effort to locate the elusive *Op. philippei.* This attractive member of the *"scolopax"* family has a finely fragmented lip pattern, and was rediscovered in recent years. Our first stop was at the monastery of Chartreuse de Montrieux-le-Jaune, where we took the long walk uphill behind the buildings. Here we found emerging spikes of *D. occitanica*, and a little further on: *C. damasonium, C. longifolia,* some *C. rubra* (just coming into flower), *L. abortivum, Neottia nidus-avis, Op. apifera* and *Orchis* (*Aceras*) *anthropophora*. However, there was no sign of *Op. philippei.* At the end of a long day, it was back to our hotel, and also back to the drawing board.

The following day (16th May), we tried another location for *Op. philippei*. This was near a small road not far from Begentier, where we carefully checked the hill slopes adjacent to the road. Several sweeps yielded *C. damasonium, A. morio,* some fading *O. provincialis*, some *Op. apifera* in bud, and a few *Op. virescens*. Eventually we struck gold in the form of three flowering plants of *Op. philippei* (see front cover photograph), with, perhaps, a further three in bud. There was a striking contrast between the darkly patterned lips and the pale petals and sepals, and we spent some time trying to capture the plants on film before heading north in the direction of the Alps.

Ophrys philippei
photo by Robert Thompson

Orchis.spitzelii
photo by John Spencer

We established a base, and were soon exploring the area between the Col de Menee and the Col de l'Alimas, referring to our site notes, and stopping to check out various places that looked interesting. En route to our first stop at the Col de Prayet, we saw: *O. simia, O. purpurea, O. anthropophora, O. mascula* var. *acutiflora, Neotinea (Orchis) ustulata, Op. insectifera* and *Op. araneola.* Away from the other orchids were some nice fresh *O. pallens,* positioned beside the road and lighting up the tree line with their bright yellow colour. Other orchids seen were: *Neottia nidus-avis, C. longifolia,* with *Gymnadenia conopsea, Listera ovata, Platanthera bifolia, D. fuchsii, Himantoglossum hircinum* and *O. spitzelii*, mostly in bud. It wasn't until we reached Tresanne that we finally saw *Cypripedium calceolus* in bud. A hillside nearby was covered with the rare *O. spitzelii,* just coming into flower and growing along-side the orchids mentioned previously. *O. militaris* was also present here together with several hybrids between this species and *O. purpurea,* which are not rare in this area. After two full days (17th & 18th May), we drove north to Grenoble and then on to Savoy.

Sadly, a stay at St Jean d'Arves was out of the question, as the hotel was now closed. We were forced back down the valley to the Hotel du Nord at St Jean du Maurienne, where the dining hall is decorated with orchid photographs. All of us had been to this area before, and this was my third visit. It is a wonderful place to find orchids, and I have seen 28 different orchid species here.

Our main aim on 19th May was to walk up Mt Charvin. Despite the fact that it was too early for many of the orchids that we had seen before, it was still worth the climb. We did see: *O. mascula, O. anthropophora,* several *O. pallens* and hundreds of *O. militaris* (no albinos this time)*, N. ustulata*, and a lone *Op. insectifera.* The day's highlight was Robert finding a group of hybrids between *O. militaris* and *O. anthropophora* on the lower slopes. This was a new combination for all of us. Later, we drove up the hairpin bends above St Sorlin to see *Dactylorhiza sambucina* in both colour forms. The plants became more numerous as we ascended, but unfortunately the pass was closed and we were forced to retrace our steps.

It was time to head back into Italy, and over the next two days (20th & 21st May) we traveled through the Alps, via the Tunnel du Frejus, to enable us to complete the circle back to Genoa. On the way, we looked at some roadside sites in the Appenines around Bardi. We found a superb site with over fifty *Himantoglossum adriaticum,* mostly in bud, but with one plant actually in flower. We were lucky to see that one precocious plant, because they tend to flower much later. *H. adriaticum* is a lot darker than *H. hircinum*, and has a distinctive tail. At the same site we found: *Ophrys gracilis, Ophrys holoserica,* a hybrid between *Op. holoserica* and *Op. apifera*, and the last flowers of *A. morio*, *O. purpurea*, *O. simia* and *O. militaris.* Also, *A. pyramidalis* and *G. conopsea* were both still in bud. A sprinkling of *"bertolonii*"- like plants, showing features of both *Op. aurelia* and *Op. benacensis*, provided a nice surprise. All of these plants had features of both species. Dropping down from the passes we saw more *D. sambucina, O. provincialis, O.mascula*, and a few *O. ovalis.* It was 22nd May and time for the return flight from Genoa to England!

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The Early Marsh-Orchid in Northern Europe

John Haggar

VI The significance of yellow flowers

The straw, cream or ivory flower colour of certain forms of the early marsh-orchid is due to anthoxanthin pigment, which might be ubiquitous in the species (Bateman & Denholm 1985). The yellow colour can only be clearly seen, however, because these yellow-flowered plants lack the ability to synthesise anthocyanins, the pigments responsible for conferring red and purple colour to the flowers and, sometimes, to other structures such as the bracts, stems and leaves. It has not yet been demonstrated that all early marsh-orchids with pale-yellow flowers share common specific genetic defects, and it seems quite possible that plants with this character may be compromised at different biochemical steps in early anthocyanin production.

Yellow flowers may occur in individual plants of any variety or subspecies of early marsh-orchid, and they are frequent in some populations. Such pale-coloured specimens are obviously morphologically consistent in all features bar flower colour with the pink, red and/or purple flowered plants that grow in their company, and they are best described as *ochrantha* forms. The possession of yellow flowers alone is not a taxonomically unifying characteristic. Some authors have called such plants "var. *ochrantha*" or even "subsp. *ochrantha*", but this is erroneous; it might be construed as suggesting a close genetic relationship between all yellow flowered specimens of *D. incarnata*, whereas this is clearly not the case (Pedersen 1998).


D. incarnata var. *incarnata* forma *ochrantha* growing at Wicken Fen in Cambridgeshire

The main subject of this essay is the yellow-flowered early marsh-orchid, variably referred to as *Dactylorhiza ochroleuca*, *D. incarnata* var. *ochroleuca* or, most commonly, *D. incarnata* subsp. *ochroleuca*. The subject of a recent morphometric study by Foley (2000), this "subspecies" is characterized not only by its pale-yellow to ivory flowers, but also by specific morphological features that are generally **not** shared with other forms, varieties or subspecies. It is this combination of supposedly unique characteristics reinforced by a distinct habitat preference that separates *ochroleuca* from forma *ochrantha*. Only twelve characters were utilized by Foley to produce a morphometric analysis comparing specimens of the taxon from single populations in Estonia, Germany and Sweden with the tiny (only 5 plants) East Anglian population at Chippenham Fen. Foley's tentative but credible conclusion was that the plants from all the study locations were conspecific. Foley's morphological data is convincing although it is questionable whether all the characters he chose were strongly genetically determined. Plant height, inflorescence length, stem width, largest leaf dimensions and bract length are vegetative features that may be affected by environmental circumstances and the state of maturity of the plants, as well as by genetic make-up. In this regard, it is notable that previous measurements of English *ochroleuca* made by Heslop-Harrison (1956) and/or by Bateman & Denholm (1985), produced mean figures that were outside the upper range limits of Foley's entire pan-European study group with respect to these characters. Indeed, recent measurements of *ochroleuca* at another English site supported this observation (R. Bateman, personal communication, 2005).

The morphology of the flower in dactylorchids, however, is generally accepted to be strongly heritable and this "subspecies" consistently exhibits large, open pale yellow flowers each of which has a labellum that bears a central vertical ridge which is somewhat convex in profile. It extends distally into a more or less discrete central lobe, and this usually confers a markedly trilobed appearance to the lip. The lateral lobes of the labellum are reflexed, normally strongly (but less so in Scandinavian specimens, in my experience), to either side of the central ridge, and their margins are clearly notched to some extent. That part of the central label-

A specimen of *D. incarnata* var. *ochroleuca* from England's largest extant population.

Var. *ochroleuca* from the mid-Öland fens.with morphological variation between flowers.

lar ridge closest to the mouth of the spur is most strongly coloured yellow, though the intensity of the shade is variable and the flower colour of some populations shows a creamy ivory rather than a distinctly yellow tone. Although there is some argument in the published literature, many authors agree that *ochroleuca* has a peak flowering time in the week leading up to midsummer, several weeks later than subsp. *incarnata* in Britain (Bateman & Denholm 1985, Lang 1989). On the single occasion that I have photographed the plant in England, it was in full flower at the end of the second week of June both at the same time and in the company of *D. praetermissa*. This year, however, it was already flowering in the last week of May and was contemporaneous with *D. traunsteinerioides* at the same site (R. Bateman, personal communication, 2005).

There is evidence from the DNA-based AFLP (Amplified Fragment Length Polymorphism) technique that some Swedish specimens of var. *ochroleuca* do indeed constitute a single inter-related monophyletic group. The procedure, however, also demonstrated interdigitation of other *ochroleuca* individuals with Swedish var. *incarnata*, suggesting that a proportion of specimens with typical *ochroleuca* morphology might actually be var. *incarnata* forma *ochrantha* if, indeed, any legitimate distinction can be made between the two (Hedrén, Fay & Chase 2001). In addition, some plants morphologically identified as var. *incarnata* seem to be related to individuals genetically identified as var. *ochroleuca.* The important point is that the study found **no** diagnostic genetic differences that allow absolute differentiation between var. *ochroleuca* and var. *incarnata* (and incidentally var. *cruenta*) from southern Sweden and the Baltic Islands. The authors suggest that **all** the morphological differences observed amongst these varieties might be oligogenically determined, so that simple genetic recombination may cause *ochroleuca* and *cruenta* forms to arise apparently *de novo* from populations of var. *incarnata*. [see Haggar (2003a,b) for a description of the Scandinavian interpretation of "var. *incarnata*". The description is broad and is not directly synonymous with subsp. *incarnata* as understood in Britain.]

It is interesting to note that the genetic marker introduced in the last article in this series (Haggar, 2005), an allozyme locus identified by Bateman, Hedrén and colleagues, occurs in its exclusively British form in English specimens of *ochroleuca*, although it occurs in its Continental form in all the Scandinavian and European specimens. The Continental marker is present in a proportion of the leaf-marked var. *cruenta* from the British Isles (including all the Scottish plants), in *D. traunsteinerioides* and in *D. praetermissa*, but has not been found in any of the other British or Irish varieties of *D. incarnata* nor in *D. purpurella*. (R. Bateman, personal communication, 2004). One interpretation of this finding might be that English specimens of subsp. *ochroleuca* are more closely related to English subsp. *incarnata* and subsp. *pulchella* than they are to Continental subsp. *ochroleuca* despite the morphological similarity. Alternative explanations are possible, though, and it is conceivable that the described genetic marker was lost from multiple forms of the species **after** they had diverged from one another, although an appropriate mechanism for such a change is hard to envisage.

Subsp. *ochroleuca* was first discovered in England in a Norfolk fen by Lousley in 1935 and subsequently at a second site in 1938. Pugsley's first descriptions in 1939 of the plant (as var. *ochroleuca*) emphasised the uniform morphology and flower colour, and contrasted this with straw-coloured forms of var. *pulchella* that he observed in West Surrey. Turner Ettlinger (1997) opined that the robustness of subsp. *ochroleuca* had to be genetically enshrined because the pink-flowered subsp. *incarnata* with which it grew was so much smaller in stature. Looked at in isolation, it is difficult to argue against the description of *ochroleuca* as a separate subspecies in England because there is no extant form of *D. incarnata* here from which it could conceivably have arisen as an *ochrantha* form. Although specimens of the poorly defined and rare var. or subsp. *gemmana* (Heslop-Harrison 1956) may share a general vegetative robustness with *ochroleuca*, the latter's floral morphology is (locally) unique and this also holds true in many of the Continental stations of the plant. Unfortunately for taxonomists, however, the characteristic morphology of *ochroleuca* is **not** unique in some of the more northerly areas of its distribution. The study referred to above, moreover, failed to clearly separate var. *ochroleuca* from var. *incarnata* genetically, particularly in the Baltic Island populations.

Ochroleuca occupies a peculiar crescent-shaped distribution across the mountainous areas of Central Europe from Eastern France across Southern Germany then northwards across the plain of Eastern Germany and Poland into Southern Sweden and the Baltic Islands (Landwehr 1977). The presence of the plant in East Anglia seems quite anomalous. To suggest that it might have been introduced inadvertently by Vikings or Danes in historical times might be more attractive were it not for the fact that Bateman & Hedrén's genetic marker appears to ally English specimens more closely to

Var. *ochroleuca* from mid-Öland. A robust individual with well developed and only weakly reflexed lateral lobes.

other British forms of *D. incarnata* than to Continental and Scandinavian populations of *ochroleuca*. The consistent flower colour and morphology of the few remaining English specimens argue strongly against the theory that an introduced Scandinavian plant might have become subsequently introgressed by British forms of the species. Although the F2 generation of such a subsp. *incarnata* **x** subsp. *ochroleuca* cross **could** give rise to a plants with yellow flowers and no Continental/*cruenta* marker, the typical *ochroleuca* flower form would surely be lost, and populations variable in both morphology and flower colour would be expected to be found.

My own crossing experiments with yellow flowered *Dactylorhiza* show that the characteristic yellow flower colour is invariably lost in the F1 generation if the plant is crossed with anything other than another yellow-flowered plant (although some purple coloured F1 hybrids retain a yellowish colouration to the otherwise white spur mouth). Turner Ettlinger (1997) expressed surprise that no *Dactylorhiza* hybrids with flowers the colour of forma *ochrantha* or subsp. *ochroleuca* had been recorded, but the persistence of the yellow flower colour appears to be entirely dependent on the perpetuation of the specific genetic defect(s) that prevent(s) the synthesis of anthocyanin and it is, of course, highly unlikely that two different taxa sharing exactly the same such flaw(s) would ever cross in nature. *Dactylorhiza praetermissa* **x** *incarnata* subsp. *ochroleuca*, for example, may well occur in the vicinity of the few remaining English *ochroleuca* but this hybrid invariably has purple coloured flowers and is otherwise **so** similar to the first parent that it would be almost impossible to recognise in the field. Even when two unrelated but apparently entirely anthocyanin-free dactylorchids are crossed there is no guarantee that the progeny will display the flower colour of either parent. Malmgren (1992) crossed a completely white-flowered and unmarked *D. fuchsii* forma *alba* from Estonia with an unmarked yellow-flowered *D. sambucina* but the resulting hybrid plants all had purple flowers.


D. praetermissa x *incarnata* var. *ochroleuca* artificially propagated from seed.

If British *ochroleuca* really is more closely related to other British forms of *D. incarnata* than to Continental *ochroleuca* then it is quite untenable to continue to refer to the plant as a "subspecies" without the genetic integrity that the term implies. Such a conclusion would lend support to my own theory that the extant British forms of *D. incarnata* are all descended from a necessarily polymorphic ancestral population that must have included individuals with the stature and morphology characteristic of modern-day *ochroleuca*. The former existence here of a pink or purple-flowered form of *ochroleuca* is strongly implied. A dark purple-flowered form has, in fact, already been described from the Baltic Island of Öland (Mossberg & Lundqvist 1994), but my own observations in the same part of the island agree with the AFLP data from nearby Gotland and suggest that the predominant mid-summer flowering forms of Swedish var. *incarnata* and var. *ochroleuca* are very imperfectly separated here. The form and structure of the *D. incarnata* populations of the middle and northern parts of Öland may well remain very close to the polymorphic ancestral state from which I believe most of the British and Irish forms have descended.

The series of photographs associated with this article include many taken from a site several kilometres inland from Färjestaden in mid-Öland. In this area many early marsh-orchids flower at midsummer and **purple-flowered** var. *incarnata*, with a stature and floral morphology like that of var. *ochroleuca* can commonly be found. In addition, large numbers of specimens of var. *ochroleuca*, although reasonably consistent with Foley's descriptions of subsp. *ochroleuca*, are rather less robust and appear to be yellow-flowered mirror images of the purple var. *incarnata* with which they grow. Interestingly, *D. incarnata* var. *ochroleuca* does not occur at all in the northern half of the island where it appears to be replaced by a variant of *D. incarnata* which has been separated from var. *incarnata* and given its own varietal name, var. *lilacina* (Sterner 1986; Mossberg & Lundqvist 1994; Rusch & Lüning 2001). As the name suggests, this plant has pale lilac flowers whose labella are marked in typical *incarnata* fashion, but in all other respects the morphology of the orchid is the same as that of var. *ochroleuca*. In the space of thirty minutes' drive, two potential parents of var. *ochroleuca* may be found, either or both of which could produce an *ochrantha* form utterly indistinguishable from var. *ochroleuca*. The obvious conclusion is that var. *ochroleuca* in the Baltic Islands is no more than


Var. *ochroleuca* and purple-flowered var. *incarnata* in mid-Öland. The floral morphology of the two plants is quite similar and the yellow-flowered plant might be considered to be var. *incarnata* forma *ochrantha*.

one more component of the var. *incarnata* complex, impossible to delineate genetically and certainly undeserving of subspecific status. Potential parent forms of var. *ochroleuca* might be found elsewhere in the area of distribution of the variety. As long ago as 1939 Pugsley noted that the existence of forms of *D. incarnata* with distinctly three-lobed lips was clearly recognised by various Continental authors, and cites the example of a var. *trifurcus* from Germany.


D. incarnata var. *lilacina* from mid-Öland, the plant grows with var. *ochroleuca* at this site.

Thus available evidence strongly suggests that var. *ochroleuca* is no more than a variety or even a forma of *D. incarnata* that has emerged and may continue to emerge from a polymorphic population complex. Perhaps its characteristic flower colour is sufficiently different from other dactylorchids that it may attract different pollinators from those attracted to pink and purple flowers (Koivisto, Vallius & Salonen 2002)? Such a situation would certainly help to explain why this variety appears to be able to persist in the company of other dactylorchids and, in most places, in the absence of any obvious parental form of *incarnata*. In Sweden the variety is popularly known as “vaxnycklar” or “wax-keys”, a reference to the fact that the flower colour is reminiscent of church candles, and that the flower spikes appear to phosphoresce in the half-light of dawn and dusk. Such an appearance might indeed attract a novel pollinator (Nilsson 1979).

Many of the montane populations of *D. incarnata* are polymorphic in a similar manner to those of the Baltic Islands, and several Alpine varieties have been named as a consequence of their flower colour and leaf markings (e.g. var. *haematodes*, var. *hyphaematodes* and var. *serotina*). It seems more than likely that genetic investigation will fail to clearly separate these varieties in the same way that it has failed in the case of the Scandinavian and Baltic populations. It has been suggested that the early evolutionary history of *D. incarnata* occurred in a montane habitat (Averyanov 1990). Such peppered isolation as mountain valleys provide might be expected to have promoted the evolution of multiple local forms, but subsequent mixing and re-separation as a result of climate-induced migrations should have ensured the continued genetic integrity of the species as a whole. The clear lack of genetic variation found in *Dactylorhiza incarnata sensu lato*, however, could suggest that the species has traversed a comparatively recent genetic bottleneck that might have been associated in some way with the geologically recent glaciations of the ice age. The exact nature of the supposed bottleneck event has not been characterised though, and it is difficult to explain why other *Dactylorhiza* species were not similarly affected. In addition, this theory does not make it easy to account for the retention or re-acquisition of such a high degree of polymorphism, albeit due to variation in only a small part of the genome. Whatever the explanation, however, it appears likely that the populations that survived these times were already polymorphic in nature, and that slight genetic variations had the effect of producing apparently disproportionate changes in phenotypic appearance, comparable to the Alpine and Scandinavian plants of today. The presence of var. *ochroleuca* in England would support the theory that the mother populations of *D. incarnata* that migrated northwards into the British Isles after the last glaciation were not significantly different from those polymorphic ones that entered southern Scandinavia or that re-colonised the Alps. Their subsequent evolution appears, for reasons unknown, to have followed a rather different pattern, and attempting to answer this conundrum will be the subject of a later article. [see www.johnsorchids.co.uk.for more illustrations]

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Marsh Orchids on Moorend Common, Buckinghamshire

Maren Talbot

As a member of the Bucks, Berks and Oxon Wildlife Trust (BBOWT), I take advantage of the many interesting guided nature walks, especially in the spring. Living in the Chilterns, one is spoilt for choice with regards to orchids, but finding them is so much easier when guided by someone who knows where they are.

In early June, I joined a walk across the SSSI at Moorend Common. The Chilterns consist mainly of chalk on clay. At about 530ft elevation, Moor Common lies on an isolated outlier of London Clay (Lower Thames Valley clay) and Reading Beds (Upper Thames Valley clay). The Chilterns used to be covered with this and the ice age scraped it off in most places. Where the clays remain, they result in acid and, in places, waterlogged soils with grassland, heath, marsh, scrub and woodland communities containing several species (including orchids) which are rare in the county.

Our leader, Alan Gudge, told us that there was an underlying fault in the chalk which caused the whole section in the area to drop. As a result the clay got trapped there whereas in other places it washed away. A stream cuts through the underlying chalk and at one place forms a swallow hole, locally known as the Swilley Hole. The area remains in its intact form because the water just runs away through this *"plughole"*, leaving the clay behind.

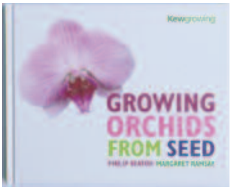
Moorend Common is intersected by a busy little road between Lane End and Frieth. I lived there for 17 years without knowing that there were orchids in the area. What a delight to return and see acres of Dactylorhiza, hundreds of them in dense clusters. We followed a footpath and nearly got run over by bounding dogs taken for a walk. Many orchids had strayed onto the path and consequently were trodden down, but the rest were flourishing. They were the Heath Spotted Orchid (*Dactylorhiza maculata*) and the Southern Marsh Orchid (*Dactylorhiza praetermissa*).

Possible *Dactylorhiza* hybrid
at Moorend Common
photo by Maren Talbot

Managed as a common by Lane End Parish Council, the area has full public access although the Swilley Hole is on private ground. Apparently people used to pick the orchids for their homes, but they are rarely dug up these days because people realise that they don't grow in their chalky gardens.

Growing Orchids from Seed

Book Review by Jim Hill



Growing Orchids from Seed by Phillip Seaton & Margaret Ramsey, Royal Botanic Gardens, Kew, London (2005). ISBN 1 84246 091 9, 83pp. Price £9.99

Growing Orchids from Seed is a new eighty three page illustrated hardback publication from the Royal Botanic Gardens, Kew, written by two members of The Hardy Orchid Society, both of whom have extensive professional experience in the storage and germination of orchid seed and their subsequent culture. This book is aimed at amateur and professional growers who lack access to a fully equipped laboratory. It starts with a basic introduction to the structure of the orchid flower, its pollination, subsequent seed collection and long term storage of seeds. All of these details are well illustrated using tropical orchids, but are also applicable to hardy orchids. This is followed by a good description of the equipment, techniques and materials used to prepare culture media. Various methods of sowing seed are described using both green and mature pods. The germination of seeds is illustrated using both tropical epiphytes and terrestrial temperate examples, and their subsequent culture is discussed. Problems of contamination, unusual seedling growth in the flask and the bugbear of non-setting media are also mentioned. The appendices list suppliers of materials, the formulae for Knudson C culture media and weaning composts, the construction of a simple sterile chamber and a useful glossary of terms used.

No mention is made of the symbiotic germination of terrestrial orchids using mycorrhizae isolated from orchids. This still needs reference to papers such as *Growing Hardy Orchids from Seeds at Kew* by Robert Mitchell *(The Plantsman, vol. 11 pp152 - 184, 1989)* and the Flasking Forum sections of *The Hardy Orchid Society Newletter Nos. 2 - 6 (1967).*

With this limitation, this is a reasonably priced very useable book which I recommend should be on the bookshelf of everyone who is contemplating growing orchids from seed

The Orchids of the British Isles
Book Review by Les Lewis

The Orchids of the British Isles by Michael Foley and Sidney Clark, Griffin Press, Cheltenham, in association with the Royal Botanic Garden Edinburgh (2005). ISBN: 0 9541916 1 7, 390pp. Price £45

"The Orchids of the British Isles" provides an up-to-date comprehensive guide to our (currently) 55 native orchid species. The majority of the book consists of a *"*Species Account*"* containing a detailed description of each of the species, illustrated by at least one full-page plate together with several smaller illustrations showing variations and/or habitat. The description of each species is accompanied by an extremely readable detailed account of its botanical history, habitat, reproduction, variants, discovery, threats and taxonomy, as well as by a distribution map and advice on where to see it. The book also lists all of the orchid hybrids which have been recorded in the British Isles, many of which are illustrated.

Supporting the Species Accounts, the book also includes informative, well-illustrated chapters on the biology of the orchid plant, orchid taxonomy and classification (based on Prof. Richard Bateman's research), distribution, ecology and identification (with keys). Particular attention is also given to orchid conservation, practical approaches to cultivating native orchids in the garden, and techniques for successfully photographing orchids.

One disappointment is the print quality of the otherwise excellent orchid photographs which, apparently as the result of using inferior paper, lack the sharpness and brilliance found in other orchid books of comparable price, such as *"The Orchids of Cyprus"* by C.A.J. Kreutz reviewed below. However, this shortcoming does not detract from the fact that this is a splendid book which is both a comprehensive and informative guide and enjoyable to read.

The Orchids of Cyprus
Book Review by Les Lewis

The Orchids of Cyprus by C.A.J. Kreutz, Kreutz Publications, Landgraaf, the Netherlands, (2004). ISBN: 90-806626-3-1, 416pp. Price £45 from Summerfield Books or 49 Euros from (CyprusKreutz@kliksafe.nl)

Cyprus is an interesting island for orchids with a good selection of eastern Mediterranean orchids, including rare ones and several endemics. *"The Orchids of Cyprus"* is a welcome follow-up by Karel Kreutz to his earlier books on the orchids of Turkey, Rhodes, the Netherlands and Germany. It gives an extremely comprehensive overview of the orchids on the island, including the Turkish-Cypriot north, following his visit in 2002 (reported in *HOS Newsletter* 28: 14) and results of the latest research.

Like some of the earlier books, *"The Orchids of Cyprus"* has parallel texts in German and English. The English text is very readable having been "anglicized" by Pamela Scraton, a co-author of *"The Orchids of Cyprus and where to find them"*. Six pages are devoted to each of the species presently known on the island. Each one is described in detail and superbly illustrated by 6 to 8 photographs showing both the whole plant and close-ups of the flowers. In addition, precise information is given on habitat, flowering time, altitude distribution, distribution on Cyprus and elsewhere, variations, distinction from similar species, hybrids and conservation.

For reasons explained in the text, "traditional" nomenclature, such as *Barlia* (not *Himantoglossum*) *robertiana* and *Orchis* (not *Anacamptis*) *palustris* is used, although this affects few species on Cyprus. As anyone who has found them on the island will know, identification of species in the *Ophrys sphegodes - mammosa* and *Serapias* groups is far from easy. The book pays particular attention to these groups and includes the recently described *Ophrys morio*, *Op. alasiatica*, *Op. hystera* and

Serapias aphroditae, as well as two newly-described *Orchis* species – *O. sezikiana* and *O. caspia*.

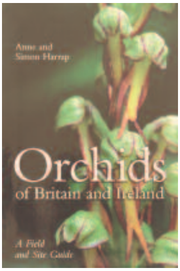
The book also contains interesting background information of a more general nature on Cyprus, including history, landscapes, climate, vegetation, conservation, botanical exploration, erroneous reports, distribution maps and statistical evaluations.

Although not quite as specific as the pocket-sized *"The Orchids of Cyprus and where to find them"*, the book gives useful guidance on where to find particular orchids on the island. However, although at 17 x 24cm, it is small enough to fit in a rucksack, it still is rather heavy to carry around for use in the field.

While the book will obviously be extremely useful to anyone planning an orchid trip to Cyprus, it will also be of interest to those who have already visited the island, especially to find out what the orchids they photographed are now considered to be.

Orchids of Britain and Ireland - a Field & Site Guide

Book Review by Tony Hughes



Orchids of Britain and Ireland - a Field & Site Guide by Anne and Simon Harrap, A&C Black, London (2005). ISBN 0-7136-6956-X, 480pp. Price £29.99

One often has a feeling of excited anticipation when a new orchid book is imminent. When this volume landed on my doormat I soon realised that I was not going to be disappointed. According to the Introduction, the authors' aims were "to introduce wild orchids to a wider audience and to show those who think they know about orchids that there is always more to learn". In the spirit of a field and site guide, the book then proceeds to tell people about the places worth visiting, to help them identify what they may find, and then to provide a great deal of supplementary information about each species. However, with 480 large pages this is not a pocket book - it must be left in the car or on the coffee table at home.

The introductory section includes a few well-organised pages of useful background information on orchid biology, habitats and conservation; then comes the main part of the book, the Field Guide. Each species is generously treated with some 6 or 7 pages of text, and includes some half dozen good-sized photos ranging from close-ups of single flowers to plants in their natural habitat. The text is excellent, is highly readable, and avoids excesses of botanical jargon. And the bonus is that the Latin names follow the recent revisions to the classification of orchids, as recommended by our President and colleagues.

The treatment of each species includes sections on identification, habitat preferences, detailed descriptions of the plant and its flowers, pollination, growth, the recorded history of the species, and conservation issues. Distribution maps are included, based on 10km squares, and taken from the BSBI's "New Atlas of the British and Irish Flora" (2002) which contains records up to 1999. All-in-all this provides a comprehensive and fascinating summary of the current state of knowledge of each species.

Then comes the Site Guide - some 40 pages of information about over 300 good places to visit for orchids, spread all over the British Isles. Most are nature reserves, and the selection of sites and species available has been carefully made with conservation in mind. Some sites for rarer species are included, but only where the site managers welcome visitors. Although this sort of information is freely available elsewhere, to have it compiled concisely in a single place will be of enormous benefit to orchid enthusiasts. Finally, to round the book off there is a Glossary of the more technical terms, followed by an extensive Bibliography.

Inevitably a reviewer has to find a few adverse criticisms, although in this case it is difficult! There are no identification keys, so the novice has to search the book to home in on the identity of an unknown specimen - good fun, but slow! Also, although *"varieties"* are carefully described, a lot are not illustrated, and the numerous hybrids mentioned are not described at all. Indeed, I noticed only one photo of a hybrid. This is rather a weakness in a field guide of this size, since it is the unusual specimens that cause observers the most difficulty. While I greatly enjoyed the large number of colour pictures, some of which are superb, the backgrounds of a few of them have a curious mottled texture - possibly due to over-enthusiastic digital manipulation? But these are comparatively minor criticisms; the book as a whole contains a wealth of information that will keep both novice and expert totally absorbed, and is thoroughly worthy of recommendation.

Lost & Found at Exeter Hall: Dark blue gilet, size L, Hardy Orchid Society badge on left breast - contact Maren Talbot (contact details inside front cover).

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Leaders: Teresa Farino & Tony Hughes

During this ten-day tour we will be exploring the two southern valleys – Liébana and Valdeón – of the limestone mountains of the Picos de Europa, where we will be concentrating on the diverse orchid flora (more than 50 species have been cited here), but can also expect to encounter a wealth of other wildlife. Our gentle pace means that there will be plenty of time for botanising, photography, bird- and butterfly-watching, and enjoyment of the magnificent scenery.

The price of the excursion – excluding flights, but including half-board accommodation, picnic lunches, minibus transport throughout, all entry fees and services of the leaders – is £920; a single-room supplement of £120 applies.

For further details, please contact Teresa Farino (address: Apartado de Correos 59, 39570 Potes, Cantabria, Spain; e-mail: teresa@iberianwildlife.com; telephone: 00 34 942 735154; website: www.iberianwildlife.com).

A percentage of the proceeds will be donated to the Hardy Orchid Society.


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