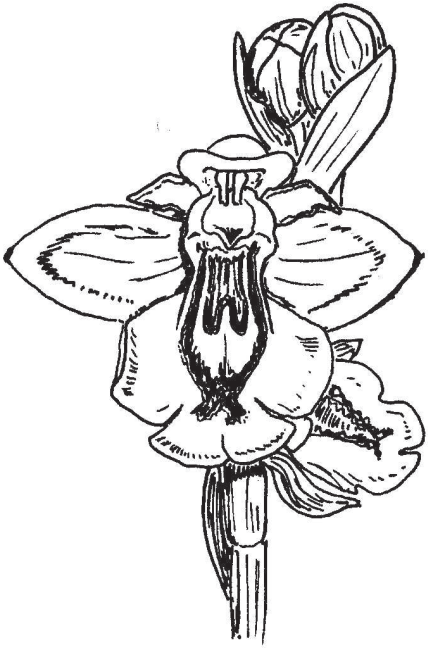
The Hardy Orchid Society Newsletter



No. 15 January 2000

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Contents

Early Spider Orchid and Dartford Warbler Field Trip, Dorset

Norman Heywood

This field trip will be for the more energetic and will take place on 29th April 2000. We shall meet at the Public Car Park in Worth Matravers (Grid Reference SY974776), which is halfway along the Purbeck ridge going west from Swanage towards Corfe. Meet at 10:00am to give plenty of time for people to get there.

It is essential that stout footwear with good soles is worn, we shall be walking along the cliffs for about five miles. Our leader for this section will be David Leigh, who tells me he has surveyed this population with our President, Paul Harcourt Davies, for many years. Bring a picnic lunch.

After lunch we shall go to the RSPB reserve at Arne, an interesting reserve with a range of habitats. Part of the walk will be along the foreshore of Poole Harbour basin through a lot of heather heathland well known for the range of snakes and lizards which inhabit it. Unfortunately we shall be a little out of season for them unless we have a period of warm weather. It's about a half-hour drive from Worth Matravers to Arne, but we shall stop halfway to try to find a Dartford Warbler or two.

In the afternoon we intend to do a stroll of about three miles, but the morning will be strenuous; up, down and along the cliffs, dropping down into the quarries and caves.

If you wish to attend please drop a line to Norman Heywood, New Gate Farm, Scotchey Lane, Stour Provost, Gillingham, Dorset, SP8 5LT, or telephone 01747 838368, this line has an ansaphone.

Numbers will be limited, first come, first served. As a courtesy to other members will any members who put their names down to come on the trip, but find they are unable to come on the day, please notify Norman. We will definitely leave the meeting point to commence the walk at 10:00am.

From the Newsletter Editor

There have recently been some small changes to the newsletter which, hopefully, members feel are an improvement. It is now produced electronically, using Microsoft Publisher, which means that illustrations and text can be arranged at the editorial stage and sent to the printer on disc. This reduces costs and allows greater use of illustrative material and I am grateful to Simon Tarrant for the help he has given to both me and our printer to achieve this.

Comments on the newsletter are always welcome. More welcome still are contributions as the content is provided for members by members.

Cover illustration: *Ophrys lutea* by Carol Dash

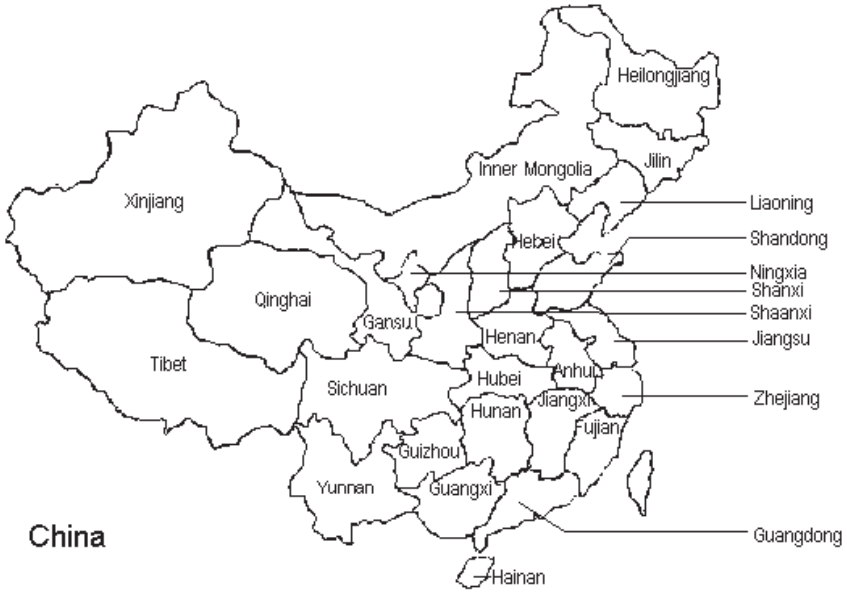
Cypripediums in China

Report of a talk by Phillip Cribb at the HOS Autumn Meeting

Orchids have long held a fascination for Phillip Cribb as he admitted to childhood memories of finding Bee and Pyramidal Orchids on the Downs. His interest in cypripediums was nurtured by being asked to join the Cypripedium Committee which is now run by English Nature, at the time he went to Kew.

His talk described species found and studied during several trips to SW China to an area which boasts an astonishing diversity of flowering plants in general and cypripediums in particular. 30 species out of a total of 47 are found in the area which also offers opportunities for him to study his other area of interest – Paphiopedilums.

The areas described in Phillip's talk were Yunnan, which is mostly a plateau, but with some areas of limestone, and Sichuan with lowland fertile plain to the east and high mountains in the west.
The first area described by Phillip was around Dali and Lijiang where the moun-



tains rise steeply beyond the town. The Jade Dragon Mountain (just under 20,000ft) is particularly good for cypripediums and has been described in print by Christopher Grey-Wilson. They are frequently found growing at the edge of rhodo-

dendron scrub above conifer forests and bamboo thickets. Here, deep valleys have been cut into the sides of the mountains by glaciers. Very powerful rivers flow only in the summer months and then with massive force. Phillip has observed that the cypripediums are usually growing in leaf litter which is very friable, very well drained, heavily leached because of the high summer rainfall and with a PH of 5.5 to 6.0.

The commonest primrose on these slopes is *Primula forrestii* which grows with *Pleione bulbocodioides*, both enjoying the very sharp drainage. Here, cypripediums, including *C. yunnanense* grow under the rhododendrons on north facing slopes. Some Common Ramshead Cypripediums (*C. plectrochilum*) and the beautiful *C. tibeticum* are also found on flatter areas and southwest slopes. Clumps of the latter can grow very big and flowers may be as big as a tennis ball. The flower stalk is hairy but the ovary is quite glabrous, and often the lip of these flowers is corrugated, leading Phillip to believe that these plants are the same as *C. corrugatum*.

C. yunnanense is a similar looking plant but with flowers only ¼ to ½ of the size and with a variously hairy ovary. It usually has long petals and a stripe down the centre of the staminode. It continues to flower as the leaves form and Chinese botanists continue to distinguish it and *C. tibeticum*. Holger Perner has described *C. x froschii* from this area but Phillip believes this to be a hybrid of *C. tibeticum* and *C. yunnanense* – both F1 and backcrosses, forming a hybrid swarm.

A lot of beautiful plants grow with the Cypripediums including *Euphorbia bulleyana, Primula bulleyana, Fritillaria cirrhosa* and the purple-flowered Meconopsis, *M. delavayi*. The commonest fir in the area is *Abies delavayi* with its rich purple, almost black cones. One of the prize plants is *Incarvillea lutea* with yellow flowers which turn red with age.

The area has been opened up by the Chinese as a tourist destination and so destruction of habitats has accelerated in the last few years. The herbaceous plants that suffer particularly from this increased human activity are those such as the spotted leafed cypripediums e.g. *C. margaritaceum* which are destroyed by both burning and collecting. Phillip noted that when pollinated, the flower stalk of this low-growing plant elongates to as much as 30cm. tall, presumably to get ripened seed into the wind.

Phillip's interest in spotted leafed cypripediums derives from the fact that botanists had put all examples together in one species, using only herbarium material, but it is now obvious that there are several different species involved. Study in the wild has also enabled botanists to establish that absence of spotting on the leaves is found in some species.

Moving further north to Zhongdian, north of the Jade Dragon Mountain, very varied plants of *Arisaema candidissimum* can be found with pink stripes, green stripes and occasional almost pure white examples. In this area of well cultivated valleys, *Primula sikkimensis* and *P. secundiflora* can be found in huge drifts in wet areas. The slopes are rich in a variety of shrubs such as *Viburnum* and *Malus* species. This area is famous for its "golden" cypripediums, but their identification poses a problem. Some features of *C. tibeticum* are obvious, but a lot lack the white rim around the lip, or have a golden rim. Lots of specimens have elements of *C. yunnanense* but are the size of *C. tibeticum*. Phillip believes that these plants which grow in pine litter among the rhododendrons are another hybrid swarm between *C. tibeticum* and *C. yunnanense*, i.e. another colony of *C. x froschii*.

This area generally can boast a number of varied habitats which exhibit equally varied flora. Masses of *C. guttatum* can be found here in very variable colour forms from very pale ones to very dark with purple splodges. The habitat favoured by cypripediums is in scrub rather than woodland. The open very mobile habitat of steep slopes such as road cuttings allow big clumps of *C. flavum* and *C. yunnanense* to grow. Although the limestone is near the surface, the soil is slightly acidic because of the high rainfall. *C. flavum* is another species to typically demonstrate high variability and Phillip recorded speckled forms, butter yellow and very pale forms with a yellow staminode instead of the yellow lip and purple staminode of the species type.

Further north in Sichuan acidic soils alternate with calcareous ones, offering a varied flora. In this area, further into the mountains and in the region of the Panda reserves, *Bletilla formosana* occurs widely, together with *B. ochracea*. These two species easily hybridise then backcross producing plants that have lost the purple edge to the lip. Here *Corydalis flexuosa* grows with the density of bluebells in the woods. *Cypripedium wumengense* with interesting spotting on the leaves but a relatively unattractive flower grows here with *C. henryi*.

On the other side of the river, *C. fargesii* can be found. Further north near the Gansu border the deep valleys contain a strange landscape of little pools of deposited calcium carbonate. Among these pools five different cypripediums may be found including *C. smithii* which also has a golden form and the only site for *C. bardolphianum. C. flavum* can grow to a metre tall in this area and other interesting plants can be found such as *Paeonia veitchii*. *Cypripedium palangshanense* which is related to *C. debile* was found in a side valley near here, growing in limestone rubble

Phillip's researches have revealed areas where cypripedium and paphiopedilum habitats overlap although he was at first personally convinced that there was no overlap. He recently visited the locality of *C. lanuginosum*, growing among very

sharp, high limestone crags among scrub regenerating after felling near the Vietnamese border at 2100m. On the same mountain *Paphiopedilum hirsutissimum* and *P. micranthum* can be found growing 600m. lower down.

His talk finished with his conclusion that there is still a great deal to be discovered about cypripediums by scientists working in the wild. A great number of species and varieties are known and described only from cultivated or herbarium specimens. However, the current rate of habitat destruction puts enormous pressure on this work.

Questions from the floor brought the following additional information:
Phillip is of the opinion that man disturbing the natural habitat in recent times causes hybrid swarms. He believes that cypripediums are less likely to hybridise naturally.
Spotted leafed varieties of cypripedium are most at risk from collectors as they are not common and are found in few sites. Holger Perner has been advising the Chinese government on propagating for a proper nursery trade but the potential financial rewards of smuggling put huge pressure on wild populations. Phillip has found no difficulty with getting permission to visit the area but is clear on the advantages of working closely within a partnership with the Chinese government, such as that developed by Kew.
(Phillip's talk was reported by Moira Tarrant)

Tripartite Relationships between Orchids, Fungi and Other Plants

Report of a talk by Jonathan Leake at the HOS Autumn Meeting

Jonathan and colleagues Dr Sheena McKendrick and Professor David Read at the University of Sheffield are involved in a study of tripartite relationships between orchids, fungi and other plants in the U.K and South America funded by the Natural Environment Research Council.

The seeds of orchids are so exceedingly small that they contain insufficient reserves to enable the plants to establish from seed without gaining carbon from other sources. In nature the germination and growth of orchid seeds depends upon infection with an appropriate mycorrhizal fungus which supplies this carbon. This relationship is required in many species to initiate germination and is essential to provide the carbon required for the early stages of growth and establishment of the plants (leading to the production of green leaves and autotrophy - the ability of plants to fix their own carbon). The majority of orchids, once they start to emerge above ground, fix their own carbon by photosynthesis and no longer depend upon

the fungi for carbon. However, a few species of orchid (about 100 world-wide) have lost the ability to photosynthesise and so retain an absolute dependence upon their fungal partners throughout their lives. Three British orchid species fall into this category: *Corallorhiza trifida* (Coralroot orchid), *Neottia nidus-avis* (Bird's nest orchid) and *Epipogium aphyllum* (ghost orchid). Whilst most common in orchids, this curious myco-heterotrophic mode of nutrition has been found in about 300 other species of plant.

The fungi which typically form mycorrhizal infections in orchids include saprotrophs which decay plant litter and some parasites which infect plant roots. However. there is increasing evidence that some orchid mycorrhizal fungi obtain their carbon not from dead material or parasitism but by forming symbiotic mycorrhizal associations with other (i.e. non-orchid) plants. Much of the evidence for the latter has come from recent studies of myco-heterotrophic orchids.

The talk focused on findings relating to the myco-heterotrophic Coralroot orchid which has only a tiny amount of green pigment, mainly in its ovaries (which may be important to facilitate the production of large numbers of seeds). The corraloid rhizome is the main body of the plant which has no leaves, just leaf-scales. The first stage in the project was a study of seed germination in the wild using the method of Rasmussen and Whigham (1993). Viable seed was trapped between nylon gauze in glass-less slide mounts which were buried at the survey site. These were recovered at intervals (3-6 months for 3 years) to enable the patterns of germination , rates of growth and developmental stages of the plants to be observed and quantified. During the project 2,000 of these seed packets were buried in a range of sites and among a range of other plant species. The sites selected included habitats in which there were known populations of the orchid, and adjacent sites which were apparently not already colonised by Coralroot orchid, to test its abilities to colonise these alternative habitats.

It was discovered that seed not penetrated by fungus remained healthy and viable for three years. Fungal penetration quickly gave seed a brownish stain under the microscope. The project has enabled the description of the early stages of germination and measurements of rates of growth and development of Coralroot orchid for the first time.

Analysis of the effect of the different habitats on germination gave some surprising results. The highest rates of seed germination and growth of the orchid occurred in sites not presently containing adult plants of the orchid, and indeed, good germination was not found around adult plants. There is therefore no evidence that growth is in any way stimulated by the presence of an older established orchid plant.

The next stage of the project was to examine to what extent the germinated plants

obtain carbon from other plants in the area. The question was further refined to specifically examine the relationship between Coralroot orchid and the roots of the trees among which it is commonly found – birch, pine and willow (dwarf willow). Individual orchid seedlings which had been germinated in the field were transferred to dishes containing soil from the field site together with a tree seedling (birch or willow) which had been grown under semi-sterile conditions from seeds or cuttings. The dishes were maintained in a plant growth room for three to four months, during which time some new seedlings of the orchid appeared in the dishes, the tree seedlings formed symbiotic mycorrhizal associations with fungus which had grown out of the orchid plants. The fungus could be seen bridging between the rhizome and rhizoids (hair-like cells) of the orchid plants and the adjacent tree seedling roots. To investigate the possibility that the carbon which is obtained by Coralroot orchid from its fungal partner originates from photosynthesis by the tree (i.e. by a tripartite relationship) radioactive carbon tracer (^{14}C) was supplied to the tree shoots as $^{14}CO_2$ and its transfer to orchid quantified. As a control, a new seedling of Coralroot orchid was inserted into the trial pots just hours before the radioisotope labelling of the tree seedlings took place. These control plants obviously lacked fungal links to the roots of the trees.

Radioactive counting of carbon movement over a few days showed a high amount of carbon transferred to the established plants and the young seedlings, but virtually no transfer to the control orchid plants. These results were consistent both with birch and with dwarf willow seedlings. Further confirmation that the mycorrhizal fungus provides the main route for carbon transfer from the tree seedlings to the orchid plants was provided from data on the growth of the orchid plants in the experiment. In control pots with either no tree partner or with pine seedlings (which failed to form fungal connections to the orchid) the Coralroot orchid plants lost weight over three to four months. In the pots in which the fungal connections between the orchid and willow or birch seedlings occurred the Coralroot orchid plants gained weight and, additionally, new plants germinated from seed introduced in the soil. This provided clear evidence of carbon flow from the partner plants to the mycorrhizal fungi and then into the rhizome systems of the orchids. It also demonstrated that substantial amounts of carbon were going into the new recruits (i.e. the newly germinated orchids) even though there was strong competition from bigger plants.

The current project builds on research by another group which had demonstrated that Coralroot orchid in Canada is infected by a fungus which is an ectomycorrhizal associate of pine trees. The previous work had shown that although the morphology of the fungus on an orchid and on a partner pine seedling may be different, the same fungus is involved and inter-links the plants, and the same has now been demonstrated for the tripartite relationship involving birch and willow.

The present study has included analysis of the DNA of the mycorrhizal fungal partners of Coralroot orchid plants collected from a study site in Scotland and at sites in Austria and the USA. This has revealed that there are two or three different closely related fungi involved in the partnership with Coralroot orchid and that they are normally mycorrhizal associates of trees, not orchids.

A number of other studies such as that of the subterranean orchid *Rhizanthella* sp. in Australia have shown that a number of different orchids rely on tripartite relationships of these kinds.

The main conclusions of the project are:

- Coralroot orchid is dependent on infection by a small group of fungi which form mycorrhizal associations with some trees (and dwarf willow).
- The fungi obtain their carbon from the trees.
- The orchid has a strict dependence on the fungi for carbon and the fungi, in turn, a strict dependence on the trees.
- The distribution of the orchid is dependent upon the coincident distribution of the fungi and their associated host trees.

These findings may enable these orchids to be grown in culture, but a fuller understanding of the relationship is essential for conservation and propagation.

In response to questions from the floor, Jonathan gave the following additional information:
The Coralroot orchid seeds were planted in the autumn, allowing active fungal growth in February to April.
It is probable that some other orchids use this type of relationship. However, the majority of orchids are known to depend on bipartite relationships with free-living fungi rather than forming tripartite relationships. Nonetheless, for many species of orchid this has not yet been confirmed, and it seems increasingly likely that a number of species which have to date proved impossible to cultivate artificially may depend upon these kinds of relationships.
It is possible that hazel and beech are important partners for the fungal associate of *Neottia nidus-avis* (Bird's nest Orchid) which he suspects is also involved in a tripartite relationship. Jonathan can only speculate on why trees enter into this partnership – do they get a benefit or are they tricked?
(Jonathan's talk was reported by Moira Tarrant)

Photographic Competition 1999 - Results

Tony Hughes - Show Secretary

Well, the photographers certainly exceeded all expectations this year! Not only were twice as many pictures as last year entered in all three slide classes, but the general standard of both prints and slides was quite remarkable. It was good to see several new names making entries (12 more competitors than in 1998), and even better to see the newcomers winning awards. Pride of place this year goes to Simon Andrew, with 2 Firsts, 2 Seconds and a Third. But we should also congratulate Heather Drope, a member from Canada, who won two Firsts and delighted us with her pictures of North American natives in their natural surroundings.

Special thanks go to Norman Heywood, who stepped in at the last moment to judge, and also talked us through all the slides during the afternoon.

By the time you read this, the first prize winning pictures should be on the HOS website - my only regret is that full justice cannot be done there to the clarity and beauty of the original pictures.

Class 1: Landscape, 6x4in Prints (7 entries)

1st	Carol Dash	Hillside with *Orchis italica*
2nd	Bill Temple	*Orchis ustulata*
3rd	Tony Hughes	Meadow + *Dact. fuchsii x praetermissa*

Class 2: Single Plant, 6x4in Prints (12 entries)

1st	Bill Temple	*Cypripedium calceolus*
2nd	Peter Green	*Cypripedium sp*.
3rd	Carol Dash	*Orchis syriaca*

Class 3: Close-up, 6x4in Prints (13 entries)

1st	Simon Andrew	*Ophrys kotschii*
2nd	Bill Temple	*Ophrys mammosa*
3rd	Carol Dash	*Cypripedium calceolus*

Class 4: Landscape, 10x7in Prints (14 entries)

1st	Simon Andrew	*Gymnadenia conopsea* var. *densiflora*
2nd	Tony Hughes	*Orchis italica*
3rd	Bill Temple	*Cypripedium calceolus*

Class 5: Single Plant, 10x7in Prints (12 entries)

1st	Michael Brownsword	*Epipactis gigantea*
2nd	Colin Clay	*Listera ovata*
3rd	Simon Andrew	*Orchis morio*

Class 6: Close-up, 10x7in Prints (16 entries)

1st	Heather Drope	*Platanthera grandiflora*
2nd	Colin Clay	*Orchis longicornu*
3rd	Bill Temple	*Orchis papilionacea*

Class 7: Landscape, 35mm Slides (19 entries)

1st	Heather Drope	*Cypripedium reginae*
2nd	Kath Fairhurst	*Orchis italica*
3rd	Alan Blackman	*Ophrys sphegodes*

Class 8: Single Plant, 35mm Slides (20 entries)

1st	Bob Charman	*Ophrys episcopalis*
2nd	Simon Andrew	*Orchis italica*
3rd	Richard Manuel	*Serapias bergonii*

Class 9: Close-up, 35mm Slides (20 entries)

1st	Tony Hughes	*Ophrys heldreichii*
2nd	Simon Andrew	*Orchis pauciflora*
3rd	Neville Roberts	*Epipactis gigantea*

Samos – an Orchid holiday

Report of a talk by Simon Tarrant at the HOS Autumn Meeting

Why Samos? The original inspiration came from two articles ten years ago in the AGS Bulletin by Brian and Eileen Anderson. They are travel writers and orchid enthusiasts, who studied the orchids of Samos and Lesbos over a period of several months in two successive years while researching for travel books on the islands. From their articles mid-April seemed the best time to go, so we set about trying to book a holiday. High Street travel agents aren't interested in anything that's not in a brochure, and direct flights don't start till May, but we discovered a small company called Gemini Holidays, through whom we booked an apartment, and we booked flights via Athens through our pet independent travel agent.

Samos is a Greek island lying in the eastern Aegean, very close to the Turkish coast. The island is roughly thirty miles long east to west and up to twelve and a half miles from north to south. There are two main areas of high ground, the larger area being the central Ambelos range, reaching 1150m, with the massive Mount Kerkis in the west rising to 1440m. The majority of the island is limestone, often metamorphosed into marble, with bands of gneiss and schist occurring as well. A main road circles the island from the main town, Samos, in the northeast, past the airport, between the mountains to the second town, Karlovasi, and back along the north coast. Our apartment was in the fishing village of Ormos Marathokampos on the south coast, in the shadow of Kerkis.

The principal areas we explored, based on information from the Anderson's writings and from our own observations, were on the main road from the Airport, west along the road to the remote western end of the island, along the minor road running north from Marathokampos and around the Monastery of Moni Vronta in the north of Samos.

After travelling all night (including a taxi ride from one side of Athens Airport to the other) we picked up our hire car at about 8 on Saturday morning, determined that nothing would stop us from getting to the apartment and relaxing. However, the orchid hunter's eye forced us to stop after only a few miles to find a range of *Orchis*, *Ophrys* and *Serapias* growing by the roadside – the sort of place where you just wander around realising that every few yards brings you a different species. We noted a few landmarks, and resolved to return the next day, when I might stand a chance of actually focussing the camera.
This site was midway between Koumaradaioi and Pirgos in a sloping rather open olive grove. From the car we had seen *Orchis italica*, these were plentiful and growing with *Serapias bergonii*. Also plentiful were *Orchis anatolica* and *O. morio ssp picta*, both of which ranged from off-white to quite deep pinky mauves in colour. We found a range of *Ophrys* here as well, including *O. holoserica*, *O. sicula*, *O. sitiaca* and *O. minutula*. There were single plants of *Ophrys mammosa* and *Orchis simia* and a few *O. laxiflora*, these being the only examples of these *Orchis* species we saw. This site was at the height of perfection at the start of our holiday – a week later many of the flowers had gone over.

West of our home village is a rather unattractive touristy sprawl, encompassing Votsalakia and Kampos. The road continues through this area and on to the sparsely populated and unspoilt western end of the island. Our second site was two kilometres west of Kampos and was a south-facing sloping olive grove above the road and only about a hundred metres from the sea. Here *Orchis coriophora ssp fragrans* was plentiful, again ranging in colour from one white-flowered specimen through to quite deep pinks. There were also a number of *Ophrys* of two species –

Orchis laxiflora
(Photo by Simon Tarrant)

O. sitiaca and *O. sicula* with its lovely yellow-edged lip. These orchids were flourishing on some of the driest parts of the hillside, but in the dips where vegetation was a bit lusher and greener *Anacamptis pyramidalis* was common. We found one hybrid between this species and *Orchis coriophora ssp fragrans*, known as *Anacamptorchis simorrensis*, a cross that sits more comfortably in Richard Bateman's classification than in the traditional one.

As we worked our way up the slope, with Mount Kerkis ever-present above us, the orchids carried on, and the views along the south coast became more attractive. In one grassy area we encountered three species of *Serapias – S. bergonii*, *S. parviflora* and *S. orientalis*. Moving down the slope again we crossed the road to a meadow area with more *Anacamptis pyramidalis*, and also a lot of broomrapes, probably *Orobanche grisebachii*, and more *Orchis coriophora ssp fragrans* and *Ophrys minutula*.

Another few kilometres west along the road skirting the southern slopes of Kerkis we stopped just past the church at Agia Kyriaki, where highlights were a few *Ophrys ferrum-equinum*, of which only one was accessible and photogenic. There were also plentiful examples of the species encountered at the last site, and a number of *Orchis sancta* in bud – another week or so and they would have been magnificent.

Moni Vronta represents a very different habitat and flora in pinewood on the north facing side of the Ambelos range. After driving along the north coast with views of Turkey only a few miles away, we climbed a long twisting road to reach the monastery entrance some 500 metres above sea level. Here we parked in the shade of pine trees in what is obviously a popular picnic area for local people. We had been directed to this site by the Andersons, to look for three particular species. These were *Dactylorhiza romana* and *Neotinea maculata*, both of which were found in modest numbers and getting past their best, and *Limodorum abortivum* which was at the stage of finger-sized shoots bursting through the pine needle litter. Also in the litter we came across some plants of *Cytinus ruber*, a ground-hugging parasite covered with scarlet scales. There was a fine colony of *Serapias parviflora* where the trees opened up, and a couple of *Cephalanthera longifolia* in the shade of the pines.

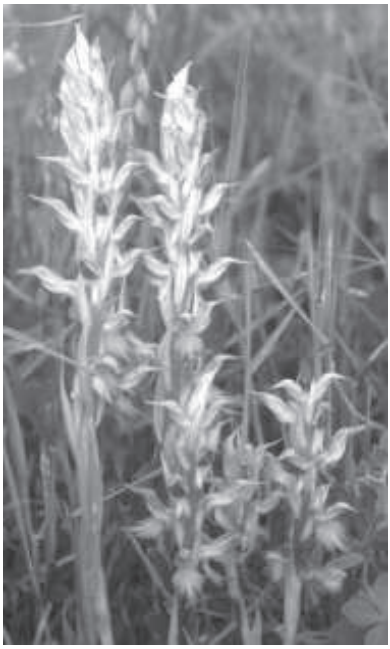
The next day saw us back on the southern slopes of Kerkis where we walked along the first few hundred metres of the Evangelista track that eventually leads up the

mountain from Votsalakia, where under the olives we found a place that was christened "Serapias heaven" on account of the large number of *S. orientalis* and *S. bergonii* that we found, as well as hybrids between them. It was heaven for other plants as well, including *Ophrys mammosa*, *O. cornuta* and *O. sicula*, and a number of *Orchis italica*. We could only speculate why this one area was so rich in orchids and other flowering plants when a few yards away there were none. We did observe that the flowers were surrounding a little chapel and could only conclude that goatherds kept their flocks away from this area – the orchids were all within a short distance of the chapel. As we climbed the slope we could admire the views along the southern coast of the island, again with Turkey (or Asia Minor as the locals called it) in the distance.

To try and find some different habitats we explored along a minor road that runs north from Marathokampos through the village of Kastanei. This is the area between the mountainous regions in the centre of the island, on the eastern flanks of Kerkis, and with views of the north and south coasts of Samos. We stopped at various points along this minor road, the first being amongst *Orchis italica* and *Ophrys cornuta*, just north of a windfarm on one of the higher ridges. Walking down a slope through bracken around here we reflected on the paucity of orchids, when something Moira said made me look back, and there hidden under the bracken was one solitary plant of *Ophrys reinholdii* carrying two perfect flowers. What Moira had said was that I had nearly trodden on a young *Orchis sancta*.

One of our stops produced some long-finished *Barlia robertiana*. North of Kastanei we parked by a pine wood, and walked along a track between the wood and an immaculately tidy vineyard. Where the wood ended was an untended area where *Limodorum abortivum* occurred, this time in full flower, one specimen being almost a metre in height. We found *Cytinus ruber* again, under *Cistus* shrubs.

To remind us that the holiday was nearly over we saw an all-too familiar sight hereabouts – numerous *Epipactis helleborine* in bud, but after a bit of searching, found one in full flower. The date was 25th April.



Orchis sancta
(Photo by Simon Tarrant)

For the last afternoon we ventured east once more to the Pirgos area, and stopped on the main road near a honey farm. Here again we found a familiar orchid, *Ophrys apifera*, and

we were struck by the proportion of very pale specimens of *Anacamptis pyramidalis*, *Orchis morio ssp picta* and *O. anatolica*, and were wondering what local factors might be at play, possibly mineral content of the soil or insect pollinators. What we did observe was that the flora and the insect life were very rich in this little area.

As elsewhere, tourist pressures are affecting wildlife on Samos (although it lags behind some other Greek islands in terms of development) and heavy grazing clearly takes its toll on the native flora. One comforting factor, I feel, is that there is a huge nature reserve occupying the entire Turkish headland closest to Samos (i.e. a goat-free zone) which must give Samos a huge dispersal of orchid seed.

Accommodation

We stayed at Studio Astradeni, Ormos Marathokampos, which we booked through Gemini Holidays, 5 Pensford Close, Crowthorne, Berkshire, RG45 6QR. Tel. 01344 750138. Our apartment was very comfortable and modern, in the same building but quite discrete from the owner's flat. The owners were charming and very hospitable, and eager to practice their English on us (English visitors are a lot less common than Germans). The village had a supermarket and a baker's shop and one or two tavernas that were open, though a lot more were still hibernating while we were there. Many more tavernas and restaurants can be found in Votsalakia and Kampos.

Gemini can arrange flights and car hire, but we preferred to use a local travel agent who understands our strange habit of holidaying outside the main season!

References

Footloose on Samos and Get me to the flowers on time, by Brian and Eileen Anderson, Alpine Garden Society Bulletin, v57 no2 June 1989

Landscapes of Samos, by Brian and Eileen Anderson, Sunflower Books, 3rd ed 1998

Plant list for Samos, by Lance Chilton, Marengo Publications, rev ed 1997

Samos – leisure map, 1:75,000, Marco Polo, obtainable from the Map Shop, Upton upon Severn.

The Cultivation of *Coeloglossum viride*

Carl Hardwick

I first bought a tuber of this delicate little orchid about five years ago – primarily because it was cheap.

For the first two years the plant grew well enough, but remained small in vegetative and tuber size during the winter rest period. The soil mixture in which it was then planted was very similar to that in which I also grow my *Orchis* and *Ophrys*: 50% grit, 30% sterilised loam from the Chilterns, 10% Perlite and 10% leaf mould.

My methods changed however, when I attended Richard Bateman's seminal lecture on the DNA analysis of terrestrial orchids. He stated that the genus *Coeloglossum* was more closely related to *Dactylorhiza* than *Orchis*, a piece of information which was to change my approach. *(A report on Richard's lecture appeared in the HOS Newsletter No. 10, October 1998, p. 12 – Ed.)*

I re-potted the tuber in the autumn to a richer mixture of 30% grit, 30% leaf mould, 20% Perlite, 10% peat and 10% loam. This mixture was also more water retentive than the original *Orchis/Ophrys* mix, akin to the mix I had previously used for growing *Dactylorhizas*.

In the spring the results proved to be spectacular. The vegetative growth of the plant reached a magnificent 12.5 inches (previously only 3 or 4 inches), with a very large flowering spike. Much to my delight, the plant won best native orchid at the HOS show. Later in the year when re-potting my orchids with fresh compost, the tuber was at least twice as large as in previous years. The plant has since gone from strength to strength, again winning at the HOS show this year. Indeed, I feel that the dramatic turn around in growth of my *Coeloglossum viride* was almost certainly due to its new treatment similar to that of a *Dactylorhiza* rather than an *Orchis*……So my thanks go out to Richard Bateman!

57 French Varieties

Alan Blackman

The plan was a ten day self-drive orchid hunt to three areas in southern France; Var, Corbières and Aude. By the end of the first day I had reached Dijon and seen two species – *Orchis purpurea* and *Himantoglossum hircinum* (the latter only in bud). By the end of the second day I was in Aix-en-Provence and had seen eight more species – things were looking up. *Orchis simia* and *O. militaris* were relatively common along the route. *Ophrys insectifera* and *O. fuciflora* were seen near Sisteron during a picnic break and *Barlia robertiana, O. araneola, Platanthera bifolia* and *Gymnadenia conopsea* just north of Aix-en-Provence.

I had planned that the serious orchid hunting would start on the third day. I had obtained a lot of information on good orchid sites – some of it a bit out of date, and all of it in German! However I had spent some time translating this and working out a rough itinerary – which as everyone knows is always impossible to keep to because you always get side-tracked and also always run out of time. My translation of the details of the first site I had selected to visit told me that there were large flat red rocks with pine trees and a stream. As I turned off the main road, sure enough, there were all the features, so I quickly parked the car and began to search. Yes, this was certainly the right area. *Serapias olbia, S. neglecta, S. cordigera, S. lingua, Orchis picta, Ophrys scolopax* and *Limodorum abortivum* were added to the list. Fired up by my success with this first site I checked out the route to the

next area, near the Mediterranean coast where *Limodorum trabutianum* had been recorded. The site was not so easy to find. My translation had obviously not been as accurate as I thought and after checking hundreds of *L. abortivum* spikes no *L. trabutianum* were seen. However, I found a fantastic "albino" *Serapias cordigera* amongst a mass of normal forms. The only other species found on this day was *Orchis champagneuxii.*

The next day my faith in my German translation was restored when the first site of the day was found with ease. As well as many of the *Serapias* spp. from the previous day, there was also *S. vomeracea* amongst a mass of *Ophrys splendida*, and in wet areas *Orchis laxiflora*. The next site was a grassy bank along the side of the road, and amongst many *Ophrys scolopax* I found a couple of *O. provincialis* – although they were going over and not worth a photograph. Also there was one large specimen of *Ophrys apifera*. A site that I had first visited eight years previously was the next on my list. This area was a damp meadow with drier tracks and grassy banks and was a mass of *Orchis militaris*, *Dactylorhiza* spp. and *O. coriophora* when I had first visited. Now, the meadow had been ploughed and was under cultivation, and only a few *O. coriophora* and *O. militaris* survived in the rough grass at the edge of the meadow. With this disappointment worrying me I made my way to a site which a colleague had visited seven years previously, wondering whether the same fate had occurred there. The area was rough grassland with limestone rocks scattered over it – this looked promising. And sure enough within a short while I had located some *Ophrys saratoi* (an *O. bertolonii* relative). Other species seen during the day were *Orchis tridentata*, *Anacamptis pyramidalis* and *Cephalanthera longifolia*.

The next day was spent travelling to the Corbières region – an area to the north of the eastern Pyrenees, south of Carcassonne. As I got into the Corbières region the roadsides were full of orchid spikes and I was expecting a successful couple of days. The first site had *Ophrys fusca*, *O. sphegodes* and *O. vasconica* as well as many previously seen species, also there were some hybrids present – *Orchis militaris x purpurea* and *Ophrys scolopax x sphegodes*. Climbing higher I found a meadow with vast drifts of orchids – eight species including four new ones for the trip – *Orchis provincialis*, *O. ustulata*, *O. morio* and *O. mascula*. Another hilly meadow contained *Coeloglossum viride* and *Orchis conica* as well as the hybrid *O. conica x ustulata*. A species that I had been given a site for and that I really wanted to find was *Orchis pallens*. As I got near to the site I saw a splash of yellow on a hillside. I stopped the car and climbed up the hill and found a mass of *Dactylorhiza sambucina* – in both colour forms. Another new species for the trip, but not the one I was looking for. With thoughts of possible misidentification by the suppliers of my information I ventured further along the road without success, and I was just thinking of turning round when, across a meadow and under a bank with some scrubby vegetation on it I saw another splash of yellow. As I hurried across the

field I could see that these were a different overall shape and sure enough they were *Orchis pallens* growing alongside some *O. mascula*.

Yellow orchids seem to have a somewhat superior quality, and I had already seen three species on this day, and there was one more possible for this area. On the way to this site I found a field full of *Dactylorhiza majalis* along with *Narcissus poeticus* and *Fritillaria pyrenaica*, another full of *Orchis morio* and a few *Neottia nidus -avis* growing under the trees. The fourth yellow species was *Dactylorhiza insularis* and my translation of the German guided me to a line of pylons and told me to look around the fifth and sixth pylons. I scoured the area which was a grassy hill with areas of gorse and broom but no sign of any yellow orchids. Time was getting on and with another site to visit before the light faded I reluctantly went back to the car. As I opened the door I glanced over the hedge into the field on the other side of the road – there was a pale yellow spike, and *Dactylorhiza insularis* was added to the list. The last site of the day was a very rocky area raised above the surrounding vineyards. After disturbing what I thought was a large moth but was actually a locust, I came across my quarry – *Ophrys catalaunica*, another *O. bertolonii* relative. It preferred flat areas between the rocks, whereas another *Ophrys* species present seemed to prefer the edges of the rocky area. This was *Ophrys lutea*. This had proved to be my most successful day so far, with sixteen new species.

The next day I travelled north to l'Aude, but there were a few sites of interest on the way. North of Carcassonne I pulled off the road onto a grassy verge by a track leading to one of the sites. As I manoeuvred the car to make sure it was clear of the road I saw some pink flower spikes. It was *Orchis papilionacea*. I had to move the car before I could photograph this group. Along the track were many *Ophrys* spp. – *O. scolopax*, *araneola*, *lutea* and *sphegodes*. Some of the *O. scolopax* looked different with smaller narrow lips and very narrow lateral petals. This was *Ophrys sphegifera*, a species not mentioned in my German notes but mentioned in Delforge's book as occurring in southern France (l'Aude and Corbières). Another site north of Carcassonne was probably the easiest to find during the whole trip. It was a heathy area, dominated by a large television mast – visible for miles around. Here I again found *Ophrys catalaunica* amongst the rocks and on the lower areas masses of *O. incubacea*. Close to the *O. catalaunica* colony but on the flatter grassy area I found a plant that was unmistakably the hybrid *Ophrys catalaunica x incubacea*. This whole area also had many *Ophrys apifera* just coming into flower including some forms approaching *var. trollii*.

The final area that I had planned to visit was the Gorge du Tarn and the Causse Noir region. Two species endemic to this area were the main purpose of my visit. Early the next morning I was up on the Causse Noir – a limestone plateau area, and before long familiar Ophrys-shaped spikes were seen alongside the road, this was *Ophrys aymoninii*. One of the plants had a divided stem, resulting in a double

spike, the division was approximately 2cm above the ground. Also present was *Ophrys insectifera* and some plants which were probably *O. insectifera x aymoninii*. Alongside a road in a valley with water seeping from the rocky bank I found *Dactylorhiza elata*. And then onto the final site of my trip, which amazingly was the only site at which I met anyone else looking for orchids! As I approached the cross-roads I noticed a car with British registration plates, and walking towards it were two people. Thinking that it would be nice to speak in English again I wound down my window and enquired as to whether they had found anything. "No" came the reply. "What are you mainly interested in?" I asked. "Ophrys species" came the reply. I had seen some *Ophrys lutea* a couple of miles down the road, so I gave them the details. Although the people had not had any luck I thought the area looked promising, so I parked the car and started searching. Just ten yards from the car I found an Ophrys. Closer inspection revealed it to be *Ophrys aveyronensis*. I looked up but the English couple had gone in search of *O. lutea*. As I prepared to photograph the *O. aveyronensis* a German car pulled up and four very jovial Germans got out – who could not speak any English. I showed then the plants of *O. aveyronensis* I had found and then they indicated that an area on the opposite hillside contained many more. They wandered off, and when I had finished I followed and sure enough on the hillside there must have been at least a hundred *O. aveyronensis* and some more *O. lutea*. The English couple never did return so I don't know if they ever found *Ophrys aveyronensis*.

This was my last day – two days left to make my way back to the Channel Tunnel. During my trip I had also seen seven other orchid species – *Listera ovata*, *Dactylorhiza fuchsii*, *D. maculata*, *Aceras anthropophorum*, *Cephalanthera rubra*, *C. damasonium* and *Platanthera chlorantha*, bringing the total to fifty-seven species and six possible hybrids during ten days in early May in southern France.

Book Reviews

The Nature Guide to New Zealand Orchids by Ian St George
Published by Godwit 1999 ISBN 1 86962040 2

The book which has a chatty style is very interesting, full of information and easy to read. The introduction includes collectors, artists, habitats, flowers, pollination, fungi, maps and Maori names!
The main text is the A-Z of New Zealand orchids (pages 38-161), this includes a generous quantity of excellent photographs, descriptions, a bit of history and a small distribution map for each species. At the end there are sections giving the derivation of names, a reading list and an index.
Bill Temple

"Les Naturalistes belges", spécial Orchidées 12
"Les Naturalistes belges" is a Belgian journal of nature studies published since 1912 in French. Since 1986, each year, a special issue is devoted to systematics, distribution, ecology, survey, and protection of the European and Mediterranean orchids, published under responsibility of the "Section Orchidées d'Europe des Naturalistes belges" with an editorial board composed of British, French, German, Spanish and, of course, Belgian referees.
So far, 13 Orchid Specials have been published, totalling 1,888 pages, 355 colour illustrations, 107 articles covering the description of 27 new species, 4 varieties, 49 new natural hybrids as well as 45 new nomenclatural combinations. Authors are mainly Belgian, but also British, Dutch, French, Italian and Spanish.
The length of articles varies from 2 to 128 pages, always with an English abstract, key-words, and list of references. The level is generally high, but nevertheless suitable to good amateur botanists.
Every 3 months, around 800 copies of "Les Naturalistes belges" are distributed, 600 by subscription mainly in Belgium and France, and 200 by exchange with European scientific institutions. The annual Special Orchid issue, which is part of the subscription, is distributed similarly, but a further 400 copies are bought each year by orchids lovers throughout Europe.
Pierre Delforge

This is a journal that appears annually, usually in the autumn, and is devoted largely to the taxonomy of European orchids, with a lesser emphasis on conservation. It is edited by Pierre Delforge who is also its major contributor. This is the sort of publication which (like its two German equivalents but not the HOS Newsletter!) suits a small minority of fans very well, but is likely to be of little interest to the majority of orchid lovers who couldn't care less how many species there are within the *Ophrys fusca* complex, or how various species of *Epipactis* can be told

apart. If you happen to fall into the first category and can read French (or are willing to give it a good try) you will find this journal good value.
Richard Manuel

Note from Ed.
"Les Naturalistes belges", spécial Orchidées 12 has just been announced. Contents include :-
Arnold, J.E.- La problématique des groupes d'*Ophrys fusca* et d'*O. omegaifera* en Catalogne.
Benito Ayuso, J. et al.- *Epipactis purpurata* et *E. distans* dans la péninsule ibérique.
Coulon, F. et al.- Section Orchidées d'Europe. Bilan des activités 1997-1998.
Delforge, P.- Contribution taxonomique et nomenclaturale au genre *Himantoglossum* (Orchidaceae).
Delforge, P.- Contribution à la connaissance des Orchidées précoces de la province d'Alicante.
Delforge, P.- Contribution à la connaissance des *Serapias* des Cyclades.
Delforge, P. & Van Looken, H.- Note sur la présence d'*Ophrys sphegodes* dans le département de l'Hérault.
Devillers, P. & Devillers-Terschuren, J.- Évolution des stations d'*Epipactis phyllanthes* en Forêt de Soignes (Belgique).
Devillers, P. & Devillers-Terschuren, J.- *Epipactis neglecta* dans le Sud de la Belgique.
Durand, Ph.- *Ophrys aegirtica* dans le département du Tarn.
Gévaudan, A.- *Epipactis leptochila* - Variabilité des populations des Alpes et du Jura français.
Hourcq, J.-J.- *Ophrys arachnitiformis*, une espèce nouvelle pour la flore des Pyrénées-Atlantiques.
Lebrun, Ph.- Une nouvelle station de *Limodorum abortivum* en Calestienne.
Lowe, M.R.- Notes sur les Orchidées des Sporades du Nord (Grèce).
Parent, G.H.- Le rôle des Becs-croisés des sapins dans la dispersion des Orchidées.
Tyteca, D. & Caperta, A.- Le statut et la protection des Orchidées du Portugal.

It is available from the Section Orchidées d'Europe, avenue du Pic Vert 3, B-1640 Rhode-Saint-Genèse, Belgium
for 20 euros incl. p & p (Postal money order or Eurocheque - no cheques other than Eurocheques.
Contents lists and prices for previous editions are available from either Moira Tarrant (address at front of newsletter) or from Pierre Delforge at the Section Orchidées d'Europe.

Members Book Offer

HOS Book Service

The Hardy Orchid Society has decided to offer members new editions of books which may be of particular interest, at reduced prices. The first of these will be **The Genius Pleione** by Phillip Cribb and Ian Butterfield, published 1999 by the Royal Botanic Gardens, Kew.

In recent years this delightful genus has undergone a remarkable resurgence with the introduction of new species and spectacular hybrids, and a new-found place in alpine gardens. Written by Phillip Cribb, Curator of the Orchid Herbarium at Kew, and Ian Butterfield, a nurseryman awarded gold medals at the Chelsea Flower Show for his work in breeding, raising and displaying pleiones, this is the first fully comprehensive account of their biology, classification and cultivation. A comprehensive listing of hybrids registered to date is provided, together with a cultivation calendar which experienced growers and novices will find invaluable. Highly authoritative, richly illustrated with 72 colour pictures and line drawings, 18 full-page colour plates and 18 maps, **The Genus Pleione** is a book professional botanists, orchid growers and alpine gardeners should not be without.
165pp 254 x 184mm Hard cover and dust jacket. ISBN 983 812 022 7
RRP £33.00

Special price to HOS members – £27.00 if collected at a Society meeting, or add £3.00 for postage and packing within the UK.

Please write enclosing your cheque made payable to the Hardy Orchid Society, if collecting please advise where you will collect from, to :-

Mr N. Heywood, New Gate Farm, Scotchey Lane, Stour Provost, Gillingham, Dorset, SP8 5LT

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In order to maintain a viable seed and fungus bank for the Society, I need to remind members to please send any spare seeds they may have.

Send SAE for seed and fungus list to :-

T. Weeks, 74 Over Lane, Almondsbury, Bristol, BS32 4BT

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