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The Hardy Orchid Society Committee

Front Cover Photograph

Peter Smith's photograph of *Ophrys attica.* See Peter's article on the lives of Peloponnesian *Ophrys* species on page 50

The Hardy Orchid Society

Our aim is to promote interest in the study of Native European Orchids and those from similar temperate climates throughout the world. We cover such varied aspects as field study, cultivation and propagation, photography, taxonomy and systematics, and practical conservation. We welcome articles relating to any of these subjects, which will be considered for publication by the editorial committee. Please send your submissions to the Editor, and please structure your text according to the "Advice to Authors" (see Members' Handbook, website www.hardyorchidsociety.org.uk, or contact the Editor). Views expressed in journal articles are those of their author(s) and may not reflect those of HOS.

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Editorial Note

Mike Gasson

JHOS is often a little short of articles on orchid cultivation so it is good to have another in Moira Tarrant's innovative series reporting on the activities of some of our expert growers – this time with John Haggar in the spotlight. The more scientific side is well-covered by Peter Smith's article on the lives of Peloponnesian *Ophrys* species, as well as by Tarmo Pikner's report of his recent visit to North Uist to explore the island's Marsh-orchid treasures. As is often the case with *Dactylorhiza* there is something of a challenge in getting a standard taxonomy that generates widely agreed names. Tarmo's piece is a case in point and here I have tried to accommodate his personal perspectives without drifting too far from the HOS standard that follows the lead of our President, Richard Bateman.

As always please do keep up the good work with articles for future issues of *JHOS*. Whilst we still have some in hand, the future does depend on maintaining the flow!

Chairman's Note

Colin Scrutton

We missed most of the domestic orchid season last year through an extended trip to Australia to photograph some of their late winter flowering orchids. This year, however, we will be on home ground throughout much of the summer and look forward to exploring more of the orchid-rich localities in Gloucestershire. Hopefully, it will be a good flowering year. Since we moved south three years ago, we have visited some local sites but the county is rich in both reserves and species. I think we will be quite busy!

We have a good selection of field meetings planned for this year thanks to Alan Bousfield's efforts as our Field Meetings Co-ordinator. Alan is retiring from the post this year after a 5 year stint and we must thank him for his input in organising the yearly field programmes. When we lived in Newcastle, Angela and I organised a field trip to Holy Island and the Tyne Valley for several years and thoroughly enjoyed the experience. We met several members of the Society as a result, among them now good friends, who we would not otherwise have encountered when we didn't travel south to the Kidlington meetings. It would be good if we could identify someone in the north of England who could take on that field meeting as it proved very popular. It's rather too far for us to continue to run it from our present location. However, this year for the first time, we are organising a field meeting in Gloucestershire together with our friends Maureen and Nigel Denman. I have to say that we will be very reliant on the local knowledge of Maureen and Nigel who live close to the Stroud Commons and know them much more intimately than we do!

This time last year, I exhorted members to explore the video possibilities of their cameras. We had three good entries in the Video Competition at Leeds last year, but we would welcome more. Videos can be on any topic relevant to hardy orchids, wild and/or cultivated. Whether or not you intend to attend the Leeds meeting (and we would like to see you there), you can submit an entry for the competition. Further information is in the box on page 61. Steve Pickersgill, who will be running the competition this year, will be posting reminders on the Forum. If you have any queries about a potential entry for the competition, Steve will be happy to help and give advice.

I mentioned above that Alan Bousfield will be retiring as Field Meetings Co-ordinator at this year's AGM. We will also have some other retirements and new appointments. David Cooper has organised the Kidlington meetings now for the last three years and Simon Tarrant has served as Publicity Officer for an impressive ten years! In addition, this is the last year that Iain Wright will act as our Examiner of Accounts. Our warmest thanks are due to all of them for their excellent work for the

Society. Although David is retiring from the Committee, Simon will be taking over the organisation of the Kidlington meetings. We will welcome Richard Kulczycki as our new Field Meetings Co-ordinator, and Sue Parker as our new Publicity and Outreach Officer. I hope they will both enjoy their roles on the Committee.

In my last note, I mentioned important posts in the running of the Society for which we need members to offer their services. We need a new Plant Show Secretary and a member to take responsibility for our PA equipment at meetings and/or electrical safety checks. As yet, no one has made contact to express an interest in either of these roles. I can't stress enough how important it is for members to come forward to at least find out what is involved. For more information on the Plant Show Secretary, contact Colin Rainbow (car.northaston@btopenworld.com) and for the PA system and electrical safety checks contact John Temporal (john.temporal@btinternet.com). Otherwise please contact me if you could contribute to the running of the Society's meetings by taking on one or other of these important jobs. The continuing success of our Society depends on the hard work of our dedicated Committee members. Without replacements from the membership when necessary, the future of our Society is at risk!

Finally, some good news. David Pearce has won 3rd prize in the British Orchid Council Photographic Competition for his photograph of *Ophrys apifera*. So congratulations to David.

Growing Hardy Orchids – 4
Moira Tarrant talks to John Haggar

John Haggar and I met on a hot sunny morning in early June in West Sussex at the site where he grows his orchids. The site, which is part of a larger meadow laid to grass, has been equipped by John with different growing spaces to suit both the type of orchid and its age and development.

John is well-known both within the HOS and the wider hardy orchid world for his very great skill at propagating from seed. He is a co-author of '*Growing Hardy Orchids*' by Philip Seaton *et al* (2011) (but ignore the photo on the back cover which is very definitely not John). He teaches hardy orchid seed propagation privately and is tutor for the HOS seed propagation workshop which is held in August each year. His skill and renown is such that he undertakes seed propagation on behalf of botanic gardens and other organisations and has worked closely with that other great propagator Svante Malmgren. When he speaks at HOS meetings you can be sure of a wealth of helpful and knowledgeable detail.

Fig. 1: Sand plunge beds – single height for *Dactylorhiza* and double for *Epipactis.* Photo by Simon Tarrant

When I arranged the meeting with John he had suggested that *Dactylorhiza* flowering time would be most interesting, although that meant missing the Mediterranean species and *Cypripedium* and being too early for *Epipactis.* So we started our tour by looking at John's *Dactylorhiza*. Bearing in mind that the majority of John's plants were raised by him the collection is housed according to its age and development. It also showed an astonishing range of species and variants. All the *Dactylorhiza* are kept in sand plunge beds built to his precise specification which is a single height breeze-block wall erected on paving but with no side-lining. He showed me that this often meant a sloshiness in the sand at the bottom level after heavy rain or when he has watered. The plants are all grown in 1litre long-toms which allows them the root-run to have constant access to the moisture. Third year/flowering size plants were in a large bed with a roof of green plastic shading and side walls of wire netting. His problem is with rabbits rather than blackbirds but the open wire netting allowing insects access means he never uses his own open-pollinated seed for propagation. Smaller second year plants were also plunged out of doors with the lid on the frame propped open but with wire netting

protection. First year plants were housed under the bench in the greenhouse where he could better control their environment including individual cloches when first out of flask. He explained that he has found that *Dactylorhiza* germinated symbiotically need to remain in their seedling pots for two years as they are smaller when deflasked whereas asymbiotically sown plants are larger so he repots them after one year. But both reach flowering size at the same age.

I asked about compost for the *Dactylorhiza.* He used to use that developed by the late Norman Heywood: 3 parts peat, 1 part grit and 1 part loam. He has been challenged on using peat in his composts so experimented with reducing the amount. He believes he can cut the peat use in half, replacing it up to 50/50 with composted bark. He tried using coir but was unhappy with the result. The compost he now mostly uses is 1 part loam, 3 parts milled peat, 2 parts composted bark, 2 parts coarse grit, 1 part fine grit and 2 parts coarse Perlite. His pots were all topped off with lime-free potting grit/ granite chips as he finds liverwort is a problem, thriving in the wet sand plunge.

At this point he showed me some of his choicer and stranger *Dactylorhiza* which he has been given or raised from seed. We were able to compare a hyperchromic specimen of *D.* ×*kerneriorum (D. fuchsii* × *D. incarnata)* with its nearly black leaves and very dark flowers with the reverse seed/pollen parentage of *D. incarnata* × *D. fuchsii* with very erect leaves like its seed parent and more conventionally coloured flowers. We looked at a Faroe Islands *D. purpurella* – very short and with black dots at the tip of each otherwise unmarked leaf. He showed me the result of raising seed labelled as *D. fuchsii* var. *okellyi* which should, of course, be white. The plants we looked at being pink were very much not *D. fuchsii* var. *okellyi* and he wonders if they might be *D. kerryensis* var. *kerryensis.*

We looked at a *D.* ×*mixta* (*D. viridis* × *D. fuchsii*); a diminutive plant with pretty pink flowers. He is fascinated that this cross results in two distinct types of offspring – the small plant we were looking at and a taller plant with a much duller green flower. I was also fortunate to see a handsome flowering plant of a *Dactylorhiza* originating from China with almost horizontally held flowers and with no markings either on the flower lip or the leaves. Prof. Richard Bateman believes it to be as yet undescribed. John has found that it produces viable seed if selfed but also increases vegetatively.

Fig. 2: *Epipactis* 'Lowland Legacy'.
Fig. 3: *Dactylorhiza kerryensis* perhaps but definitely not *D. fuchsii* var. *okellyi*.
Fig. 4: *Dactylorhiza* × *mixta (D. viridis* × *D. fuchsii*).
Photos by Simon Tarrant


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At this stage we moved on to look at John's *Epipactis* most of which were not yet out. These he keeps in a sand plunge bed two breeze blocks high. He finds this keeps the root temperature constant which the plants enjoy and because the plants are large and vigorous they grow through the bottom of the pot into the sand. He uses a richer compost for the commoner *Epipactis* than some growers of 50% JI2 and 50% Perlite. This mix won't however suit all species. *E. palustris, E. mairei* and their hybrids don't like too much loam and fertiliser, for example, and prefer a grittier and sandier mix. In many cases Andrew Bannister's compost mix[1] may be a better choice or possibly just a mix of composted bark, sharp sand and a little crushed oyster shell. John treats *E. mairei* like *Cypripedium* keeping it fairly dry in winter.

He thoroughly recommends some hybrids such as *E.* 'Passionata' *(E. palustris* × *E. royleana)* which is a lovely example of a red hybrid and very floriferous. He also praised *E.* 'Barbarossa' *(E. gigantea* × *E. atrorubens)* but finds this a hard cross to make. He has found that many experimental crosses of *Epipactis* will make plants with lots of leaves but little by way of flowering. He has managed to raise and flower *E. helleborine* by scattering seed into the mid-summer dry cracks around some small Silver Birch trees on his site.

Although his *Cypripedium* had all finished flowering, we stopped briefly at the cold frame where they were growing. This frame like the others was protected with wire netting as rabbits had caused a great deal of damage to the plants in the past. He uses a number of different composts according to species using information from '*The Genus Cypripedium*' (Cribb 1997). In the chapter on cultivation (p. 60) the late Holger Perner discusses at length suitable components and mixes. John finds that he feeds the plants only occasionally as most years they grow well without.

We moved on to look in his greenhouse which is a standard design aluminium 8' × 12' structure with two layers of plunge bed along each side and across the end. The south and west facing sides were given a shading wash and good ventilation from top and side louvres. More *Epipactis* were obvious; huge plants in 12" and 14" pots in full flower. These and more *Dactylorhiza* are the ones he uses for hybridising through hand pollination. Also plunged in the greenhouse were *Epipactis* seedlings and re-potted divisions as well as the first year *Dactylorhiza* seedlings plunged at the lower level under the bench.

Fig. 5: Greenhouse with two levels of sand plunge beds.
Fig. 6: John Haggar.
Fig. 7: John's soil steriliser.
Photos by Simon Tarrant


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He showed me his winter-green plants all, by now, drying off before being moved under the bench for the summer. I noticed that he uses double-potting for most of his winter-green Mediterranean plants: 4½" (11cm) clay pots plunged in a 2 litre long-tom. He explained that when they are in full growth (but not in extreme cold weather) he stands the long-toms in a shallow tray of water until all is soaked up then repeats this if the weather is favourable to growth. The greenhouse has a small fan heater controlled by a thermostat set at 3°C. He told me that, surprisingly, the site can be very cold in winter as the South Downs stop warm air flowing in. He can leave his home on the coast on a relatively mild winter day and find hard frost at the orchid meadow. Conversely the site traps hot air in summer.

I asked John about his feeding regime. He had already told me that he doesn't feed his *Epipactis* feeling that the JI content in the compost provides plenty of nutrient. All his *Dactylorhiza* including seedlings are fed every two weeks when in growth with 5ml fish emulsion and 5ml seaweed extract in 8 litres (1½ gallons) of water. His winter-green Mediterranean orchids he feeds with Rainmix[2] at full strength every couple of weeks but this has to be watered from above as to add to the water trays would turn the standing water green. He is careful to avoid wetting the leaves in cold weather.

I asked about John's compost ingredients. For most *Dactylorhiza* he uses molehills from on site which, being Weald clay, is alkaline with a pH of approximately 7-7.5. For *Dactylorhiza* preferring an acid loam he drives to the Ashdown Forest where the molehills are from the Hastings Beds – a mixture of sandstones and clays. For winter-greens he collects molehills from the Jurassic limestone area in Northamptonshire being careful to collect from near the escarpment. All the loam is sieved through a ½" or ¼" mesh and then sterilised using an old-fashioned soil steriliser. He discovered that this excellent piece of equipment is no longer manufactured but can occasionally be picked up on E-bay. Soil in the steriliser is effectively pasteurised by standing it over a pan of boiling water until steam escapes from the top then cooling it rapidly by tipping it out onto a tray. He collects pine duff and leaf mould and also uses Seramis[3] and cat litter (a non-clumping, low dust, baked clay variety[4]) or Ultrasorb[5]. He admitted that for winter-greens he varies the compost every year but his current choice is 6 parts sterilised loam (sieved molehills collected from a hard limestone area), 2 parts Cornish grit (part coarse and part fine), 2 parts sharp sand, 2 parts leaf mould, 1 part fine composted bark, 1 part coarse Perlite and 3 parts Seramis/ Ultrasorb. He likes to experiment with his composts, for instance by potting half of a batch of seedlings in one mix and half in another. His sand plunge beds are all filled with sharp sand bulk bought from a builder's merchant. The only variation is that for *Cypripedium* which is 50% peat and 50% sharp sand.

Although John's first love is clearly *Dactylorhiza* and *Epipactis* he had a huge variety of hardy orchids growing successfully; at one end of the scale a huge pot of *Bletilla*

which he said badly needed re-potting and at the other end a small pot of tiny bright green leaves whose identity he challenged me to guess – I failed! They were Fen Orchid *Liparis loeselii* which came to him in flask from another HOS member. John was growing them in a pot half filled with compost and then with live sphagnum moss in which they were thriving. I came away from a very enjoyable morning of sharing in John's obvious passion for the orchids he grows. I am greatly indebted to John for his time and enthusiasm.

References

Seaton, P., Cribb, P., Ramsay, M. & Haggar, J. (2011) *Growing Hardy Orchids* Royal Botanic Gardens, Kew.

Cribb, P. (1997) *The Genus Cypripedium* Royal Botanic Gardens, Kew in association with Timber Press.

Products & sources mentioned by John Haggar

(These are John's personal preferences and are in no way endorsed by the HOS)

1. Andrew Bannister's terrestrial orchid compost - Andrew (Orchid Alchemy) tells me that this is 5 parts sharp sand, 2 parts Perlite, 2 parts fine bark and 2 parts JI2. You can read more about Andrew's growing in the future as he has kindly agreed to be interviewed for this series.

2. Rainmix: An orchid fertiliser in powder form which has been especially developed for use with rainwater, RO water or soft city water.
Available direct from www.akerne-orchids.com or https://orchidsupplies.co.uk

3. Seramis: a high quality clay growing medium. Available on-line.

4. Non-clumping cat litter - John recommends Tesco low-dust baked clay variety as the wrong sort could be disastrous.

5. Ultrasorb: calcined clay granules. Now difficult to obtain and non-clumping cat-litter is a very suitable alternative.

Malvern International Orchid Show, 14th - 16th June 2019

Irrespective of what happens to BREXIT, the Malvern Show will take place this year at the Three Counties Show, with setup on Thursday 13th. The usual low-cost tickets will be available this year at £8 per ticket. These can be used by HOS members, their families and their friends. To obtain tickets, send a cheque payable to 'Iain Wright' for the correct amount together with a stamped addressed envelope in which to send your tickets back to you, probably in mid to late May. Contact Iain Wright at iaincwright@windmill.me.uk, telephone 01743 884576. For postal enquiries and cheques, use Celia's address as shown inside the Journal's front cover. The deadline for your requests is the 1st May.

Tracking Life Experiences of some Peloponnesian *Ophrys* Species

Peter B. Smith

Around a decade ago, I attempted to broaden my understanding of the orchids of the Greek mainland by undertaking some simple descriptive studies. I was interested in such issues as how often they achieved pollination, what influenced pollination rates and what were the consequences of fruit set. Much influenced by the classic studies of *Ophrys sphegodes* in the UK by Mike Hutchings (Hutchings, 2010), I laid out a series of small uncultivated quadrats on calcareous grassy W and SW facing hillside sites in the Southern Peloponnese, marking the corners with metal pegs. I revisited these sites annually each spring from 2005 to 2010, noting the precise locations of all orchid plants that were present within these quadrats, and, where possible, the species. From 2005-9 I recorded the presence of fruit set for each plant that had open flowers. From 2006-10 I also recorded height, leaf number and flower number, but in 2009 my visit was too early in the year to record fruit set for some species, and in 2010 for all species. The largest of the quadrats was 2m × 4m and the smallest was 1m × 1m. Site selection in 2005 was based on the need to include an adequate sample of *Ophrys tenthredinifera* (1 site), *Ophrys bombyliflora* (1 site) and *Ophrys attica* (2 sites). My plan was to record 50 plants per species per year. This proved practicable for *O. tenthredinifera* and *O. bombyliflora*, but plants of *O. attica* tend to be more widely dispersed, which attenuated the samples within the selected sites. In succeeding years, I added a site each for *O. argolica* (2006), for *O. cerastes* (2007) and for *O. ferrum-equinum* (2008), but records for these sites were only completed for some of the subsequent years. The site for *O. argolica* was destroyed by building work some months after I had surveyed it. Occasional plants of other *Ophrys* species (particularly *O. lutea*) occurred on my designated sites and the results presented here refer to all records from all sites. The sites were all within 5 km of the sea. Table 1 gives details of the number of plants of each species that were surveyed in each year. Unsurprisingly the taller species had somewhat more flowers and leaves per spike. There was no overall trend in the frequency of spikes per year, with some species increasing and others stable or decreasing.

Fruit Set

My primary focus of interest was in rates of fruit set, and I had some data on this from eight species, with substantial samples from three. Fruit set by *Ophrys* species has been reported as highly variable, with low prospects of reproductive success compensated by production of large amounts of seed (Sonkoly *et al*., 2016). These authors give fruit set rates of between 25 and 67% for three non-autogamous *Ophrys* species in Hungary, but it is unclear whether these rates are per flower or per plant. Review of relevant literature by Jacquemyn & Hutchings (2015) yields fruit set frequencies for *Ophrys sphegodes* of between 2 and 52% per plant in various locations, with higher rates reported for more isolated plants and lower rates for

Year	*Ophrys attica*					*Ophrys bombyliflora*			
	N	H	LVS	FL		N	H	LVS	FL
2006	55	6.9	3.0	3.7		57	10.6	4.0	2.6
2007	44	11.7	1.7	4.5		74	11.6	2.3	2.6
2008	24	10.6	2.4	2.8		104	10.7	2.9	2.3
2009	9	9.1	2.4	3.3		-	-	-	-
2010	8	11.6	3.1	3.4		-	-	-	-
Overall	140	9.5	2.5	3.8		235	10.9	3.0	2.5

Year	*Ophrys tenthredinifera*					*Ophrys cerastes*			
	N	H	LVS	FL		N	H	LVS	FL
2006	100	10.7	2.7	2.3		-	-	-	-
2007	62	10.2	2.3	2.5		19	17.5	2.5	4.5
2008	140	9.8	2.6	1.9		16	16.6	3.0	2.8
2009	71	8.4	3.3	1.9		-	-	-	-
2010	52	9.0	2.7	2.2		-	-	-	-
Overall	425	9.7	2.7	2.1		35	17.1	2.7	2.5

Year	*Ophrys argolica*					*Ophrys ferrum-equinum*			
	N	H	LVS	FL		N	H	LVS	FL
2006	48	22.3	4.3	4.4		-	-	-	-
2007	1	22.0	2.0	4.0		-	-	-	-
2008	1	18.0	3.0	2.0		70	12.2	2.8	2.7
2009	-	-	-	-		12	14.8	4.0	4.3
2010	6	22.2	3.8	3.7		47	16.5	3.2	3.3
Overall	56	22.2	4.2	4.2		129	14.0	3.0	3.1

Table 1: Mean Height (cm), Numbers of Leaves and of Flowers of All Species 2006-10

N = Number of plants; H = Height; LVS = Leaves; FL = Flowers

plants with a higher density of neighbouring conspecifics. Table 2 shows that for all but one of the species sampled by me percentage fruit set per plant was indeed low. However, the percentage for *Ophrys lutea* was substantially higher. Furthermore, while for all other species fruit set per plant was almost always one, for *Ophrys lutea* two or three pollinated flowers per plant was frequent. I have not been able to find any published information in Delforge (2006) or elsewhere that *Ophrys lutea* might sometimes self-pollinate. Given the contrasting results for the small samples for the closely related *O. lutea* and *O. sicula*, further counts would be desirable.

Correlates of Fruit Set

The combined roles of chemical, visual and tactile stimuli in two of the species that I sampled most closely (*O. bombyliflora* and *O. tenthredinifera*) have been fully described by Francesco & Ascensao (2013). Francesco & Ascensao propose that for species such as these that are pollinated by *Eucera* solitary bees, the production of highly volatile scents serves the purpose of long distance attraction whereas visual stimuli may be more important once the bee is close to the plant. Conversely, they note that in species in section Pseudophrys (such as *Ophrys lutea*) that are pollinated by *Andrena* solitary bees, less volatile scents predominate and these may be more important as bees approach close contact with the flowers. Taller spikes tend to have more flowers, which may enhance the probability of pollination if visual stimuli are particularly important, but not if chemical stimuli are critical. Vandewoestijne *et al*. (2009) found that height and flowers per spike were significant predictors of fruit set in three species of *Ophrys*. I therefore examined the relationships between spike height, flower number and fruit set in the species that I sampled.

Among the 373 spikes recorded of *Ophrys tenthredinifera*, the 25 spikes with set fruit had mean height of 12.9 cm (SD 4.3) and 3.2 flowers, whereas the 344 spikes without set fruit had mean height of 9.6 cm (SD 2.7) and 2.0 flowers. These differences are statistically significant for height ($t = 4.07$; $p < .001$) and for number of flowers ($t = 4.49$; $p < .001$). Logistic regression showed that once the variance in flower number is taken into account ($B = .73$; $p > .001$), height is no longer a significant predictor of fruit set ($B = .15$; $p = .08$). The relevance of height is presumably because greater height is associated with increased flower number.

Among the 121 spikes recorded of *Ophrys attica*, the ten spikes with set fruit had mean height of 10.3 cm (SD 3.2) and 3.2 flowers, whereas the 111 spikes without set fruit had mean height of 9.3cm (SD 3.7) and 3.9 flowers. These differences are not statistically significant. Among the 235 spikes of *Ophrys bombyliflora*, the 27 spikes with set fruit had mean height of 11.6 cm (SD 2.5) and 2.7 flowers, whereas the 208 spikes without set fruit had mean height of 10.9 cm (SD 2.6) and 2.4 flowers. There is a tendency for fruit set to be associated with flower number ($t = 1.97$; $p = .056$) but not with height. The data for the remaining species are insufficient to provide reliable estimates.

Year	*Ophrys attica*		*Ophrys bombyliflora*		*Ophrys tenthredinifera*	
	N	%	N	%	N	%
2005	1/20	5	7/53	13	2/65	3
2006	5/56	9	7/59	12	12/100	12
2007	3/44	7	13/74	18	8/62	13
2008	4/27	15	9/105	9	5/141	4
2009	-	-	-	-	4/71	6
2010	-	-	-	-	-	-
Overall	13/147	11	36/291	8	31/439	7

Year	*Ophrys cerastes*		*Ophrys argolica*		*Ophrys lutea*	
	N	%	N	%	N	%
2005	-	-	-	-	1/1	100
2006	-	-	3/36	8	1/3	33
2007	4/19	21	1/1	100	-	-
2008	3/16	19	0/2	0	3/3	100
2009	-	-	-	-	13/23	57
2010	-	-	-	-	5/25	20
Overall	7/35	20	4/39	11	23/55	42

Year	*Ophrys sicula*		*Ophrys ferrum-equinum*	
	N	%	N	%
2005	1/12	8	0/1	0
2006	-	-	-	-
2007	-	-	-	-
2008	1/3	33	1/66	2
2009	1/1	100	-	-
2010	-	-	-	-
Overall	3/16	5	1/67	2

Table 2: Percentage Fruit Set 2005-10

Thus, *Ophrys tenthredinifera* appears different from the other two species in showing the value of greater height and flower number in achieving fruit set. Flower number may be particularly critical, since it not only makes the plant more visible but also extends the period of time permitting pollination. The predominantly French populations of the three species sampled by Vandewoestijne *et al*. (2009) (*O. insectifera*, *O sphegodes*, *O. fuciflora*) all had mean heights much greater than those sampled by me. Thus, my finding of a significant effect for the tallest of my three species but not for the other two may define the limits of this effect. It is possible that among less tall species, proximity to one another may enhance visibility and hence pollination, but I did not measure this. However, Vandewoestijne *et al*. (2009) found that proximity to conspecific neighbours had no effect additional to the effects of height and flower number in their samples.

Longevity and Ageing Effects

On the basis of sampling over many years, Hutchings (2010) was able to estimate the half-life of *Ophrys sphegodes* as 2.25 years. Because of the extent of his database, he was able to overcome the difficulty posed by the fact that a plant that emerges in a given year may be a new recruit to the population, but may also be one that had established itself in preceding years. His estimates of half-life included vegetative plants as well as flowering plants. I was not able to include vegetative plants in my sampling, as the presence of different orchid species within several quadrats left me uncertain as to the identity of some of the vegetative plants. Hutchings distinguished between dormancy and death, defining a plant's death as probably having occurred if it failed to reappear for three consecutive years. Over the six years that I conducted my survey I could not distinguish death from dormancy. I identified the location of each flowering plant by measuring its distances from two of the adjacent borders of the quadrat. A plant was deemed to be a return from preceding years if it emerged within 2.5 cm of the point recorded in the previous year. This is a more relaxed criterion than that used by Hutchings, but it nonetheless does give an indication of the decline in return rate for each species. Note that if a plant produces a spike in several successive years, each return is included in the count. The numbers of sampled plants given in Table 1 therefore do not necessarily refer to the actual numbers of plants that were present.

For *Ophrys tenthredinifera*, I found 216 returns of a possible 523 (41%) after one year, 93/369 (25%) after two years, 14/227 (6%) after three years, 15/165 (9%) after four years and 5/65 (8%) after five years. For *Ophrys attica*, I found 81 of a possible 192 returns (42%) after one year, 37/162 (23%) after two years, 20/116 (17%) after three years, 10/75 (13%) after four years and 1/20 (5%) after five years. The median return rate was thus between one and two years for both species. It appears that at least in the environments that I sampled both species are somewhat less long lived than *Ophrys sphegodes* in Sussex, UK. I found it impossible to estimate the life

expectancy of *Ophrys bombyliflora,* because its capacity for vegetative multiplication by way of lengthy underground root tubers ensures that spikes from the same plant are likely to appear in different places each year. Among the remaining species that appeared within the quadrats, numbers were too small to draw firm conclusions but *Ophrys lutea* had a one-year return rate of 4/11 (36%), *Ophrys cerastes* had a one-year return rate of 9/31 (29%) and *Ophrys ferrum-equinum* had a one-year return rate of 11/68 (16%).

Ophrys bombyliflora (top)
Ophrys tenthredinifera (bottom)
Ophrys attica (front cover)
Photos by Peter Smith

I was also interested in whether successful fruit set would influence the probability of emergence in the subsequent year. Between 2008 and 2010, I therefore made a small experiment in three new quadrats, in which I attempted to pollinate a randomly selected sample of spikes manually and masked an equivalent number of spikes with muslin to prevent pollination. Spikes included in this study were not included in the fruit set data presented in Table 1. For *Ophrys tenthredinifera* the return rate for manually pollinated spikes was 8/29 (28%). For masked spikes it was 20/45 (44%). The difference in numbers of spikes in the pollinated and masked treatments was because I was not always successful in manual pollination. For control spikes that were neither masked nor pollinated the return rate was 16/44 (36%). The frequencies for masked spikes and control spikes are comparable to the overall one-year return rate of 44% from non-experimental quadrats reported above. It appears that fruit set may somewhat depress the return rate for this species, perhaps because of the energetic cost to the plant involved in supporting the development of a fruit. I attempted a similar study with *Ophrys attica*, but its overall frequency in my experimental quadrats in these years did not yield an adequately large sample. The return rate for pollinated spikes was 3/8 (37%) and for masked spikes it was 3/12 (25%).

Discussion

I undertook this research in an attempt to move beyond the basic, and delightful, enterprise of finding and identifying Mediterranean orchids in the field. In doing so, I learned several things. Firstly, I became aware of how little we know about the factors involved in the continuing success of the species that I examined. Frequencies at the same site varied greatly in different years, which could be due to variations in mortality, dormancy or recruitment rates. Detailed examination of local meteorological data might shed light on relevant factors. Hutchings (1987) found that preceding winter rainfall was correlated with spike height in *Ophrys sphegodes*. In the period of my study, the frequency of *Ophrys tenthredinifera* fluctuated markedly, while that of *Ophrys bombyliflora* doubled. *Ophrys attica* decreased and was increasingly displaced by more vigorous species, particularly *Tetragolonobus purpurea* and *Onobrychis caput-galli*. Vigorous invaders were less in evidence at the site for *O. tenthredinifera*, with some bare ground remaining. As with *Ophrys sphegodes*, persistence of *O. attica* and *O. tenthredinifera* may require some disturbed ground. The factors relating to *O. bombyliflora* may differ, given its reliance on vegetative tubers. Secondly, I learned that this type of study will only give clear findings if it is conducted over a sufficient number of years to be able to distinguish dormancy from death. Finally, I note that the study raised several intriguing questions that require further study, particularly the distinctive fruit set frequency of *Ophrys lutea*, the question of what enhances pollination where height and flower number are not predictive, and the possibility that fruiting impedes the return of *O. tenthredinifera*.

Acknowledgement.

I am grateful to Mike Hutchings for his help through all stages of this project.

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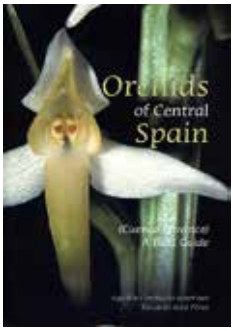
Book Review: *Orchids of Central Spain (Cuenca Province)*

Colin Scrutton



Orchids of Central Spain (Cuenca Province) by Agustín Coronado Martínez & Eduardo Soto Pérez.
Jolube Consultor Botánico y Editor, 2019
ISBN 978-84-947985-2-8.
244 pages. 33.95€ (25.95€ + €8 shipping).
Contact: José-Luis Benito Alonso:
www.jolube.net; jolube@jolube.net

It is many years since Angela and I were last in Cuenca, long before our interest in orchids developed. Having reviewed this excellent book, however, it will not be long before we organise a return visit! This is much more than a field guide. In addition to the 57 species that are illustrated and described, there are sections on orchid biology, morphology, evolution and classification, pollination strategies, hybrids and fungal relationships. The latter could have mentioned the importance of mycorrhiza in breaking down organic matter in the soil and connections to the roots of other plants in transferring nutrients to the developing orchid embryo. A section covers orchid protection and there are extensive lists of orchid societies with websites (although the web addresses are not given), publications, "taxonomic specialists" (actually a list of sources for orchid floras), other sources of information on orchids, pests, diseases, botanical gardens and bodies with interests in orchid conservation. This is a translation of the Spanish edition of this book and with very few exceptions, the quality of the English is excellent.

The book begins with a section on how to use the guide. This is followed by a section on the use of UTM coordinates, very useful as towards the end of the book, the authors give 1km^2 UTM coordinates for virtually every plant they have found in the province listed under species. Each entry includes the name of the municipality, the name of the location, the altitude and the habitat and ranges from 61 locations for *Cephalanthera longifolia* to one for *Serapias lingua* and one or two other rarities. The habitats are given in Spanish with a table of English translations given at the end of the section. A 1km square is still going to give you a fair bit of searching, but I

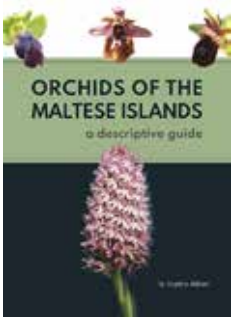
have never encountered this sort of data in a field guide before! There are sections on the natural landscapes and habitats found in the Province of Cuenca near the beginning of the book.

Finally, back to the core of the book, the 57 species found so far in the province. The left-hand page has a map of the province with the UTM 10km^2 grid superimposed and locations for the species blocked in. The species is described, plus habitat, flowering period, companion orchids, hybrids if any, chromosome number, pollination, synonyms and comments. The opposite page has pictures, usually three with small corresponding boxes bottom right containing an initial letter naming the view shown. Unfortunately, the initials are for Spanish words, p – planta; e – espiga (inflorescence); d- detalle (close-up) and in one or two places h – hojas (leaves), and f – in two different places, either flores or fruitos. Of course, the good quality pictures speak for themselves and would really need no notations. At the end of this section 16 species found in neighbouring areas, or recorded by other authors in Cuenca Province, are briefly described and illustrated.

It is probably superfluous to say in conclusion that I thoroughly recommend this book, certainly if you plan to visit Cuenca but also if you are going orchid hunting in Spain, or indeed if you just enjoy browsing a beautifully produced, comprehensive and thoroughly enjoyable book on orchids!

Book review: *Orchids of the Maltese Islands*

Les Lewis



Orchids of the Maltese Islands by Stephen Mifsud
Published by the author 2018
ISBN: 9789995713676
232 pages, colour photos, colour distribution maps
€25 (paperback), €35 (hardback), + postage
Available from http://www.maltawildplants.com/book_orchids.html
Paperback £33.50 +PP from NHBS; £29.50 from Summerfield books

Orchids of the Maltese Islands is the first book dealing with the wild orchids occurring in the Maltese Islands. It provides comprehensive up-to-date information on all 36 species which occur there as well as their hybrids, supplemented by more than 300 photographs and 40 distribution maps. It is written by the qualified local botanist and plant taxonomist Stephen Mifsud who has studied the Islands' orchids and other flora for the last 15 years and is the web-administrator of the website http://www.maltawildplants.com/ which describes and illustrates the rich flora of the Maltese islands, including their orchids.

The main text starts with a chapter on the "Biology of Orchids" which includes a comprehensive introduction to the evolution, ecology, classification, hybridisation and pollination of orchids. This is followed by a chapter entitled "Systematics and Classification" which includes a composite identification key for determining species in the field, divided into five easy-to-follow keys. The majority of the book is taken up by a Chapter entitled "Orchid Profiles". This devotes several pages to each of the species and hybrids which currently occur on the Maltese islands, including several recently named taxa. As illustrated by the pages on *Anacamptis collina*, each profile includes close-up photographs of the orchid concerned accompanied by a detailed description, as well as information on its habitat, frequency, local and global distribution, variability, closely related species, known pollinators, and taxonomy (including a list of synonyms together with the names recently used in other publications).

The orchid profiles are followed by informative discussions on *Anacamptis pyramidalis* s.l. and the *Ophrys iricolor* and *Ophrys lutea* groups in the Maltese Islands, on the origin and systematics of the endemic *Ophrys melitensis*, on orchids presumed extinct from the Maltese Islands, and on misidentified orchids of the Maltese Islands. The book concludes with an Appendix on related orchids occurring on the neighbouring island of Sicily illustrated by photos, reference tables for quick access to information such as flowering periods, common names and taxonomic lists, a summary of orchid protection in Malta by a Deputy Director of the Environmental and Resources Authority, and a glossary of botanical terms.

Accordingly, the book provides an easy-to-use field guide to the orchids of the Maltese Islands with detailed information on the identification, distribution and flowering time of each taxon supplemented by close-up photographs. It also provides detailed, comprehensive, scientifically-based information on them. It will therefore be invaluable to visitors who are interested seeing the orchids of the Maltese Islands, as well as to those who want to study them and compare them with related taxa, especially as it is the first book to be published on these orchids.

Jeffrey James Wood (1952-2019)

Phillip Cribb

Jeffrey Wood, who was one of the foremost orchid taxonomists of his generation and the curator of the orchid herbarium at Kew from 2006 until 2012, passed away after a short illness on 10th February. Jeffrey joined the Kew staff in 1971, transferring from the Natural History Museum, whose staff he joined on leaving school at 18. His Kew career began as assistant scientific officer in the Orchid Herbarium under Peter Hunt and he remained there for the rest of his working life. In 2006 he succeeded me as the sixth curator of the orchid herbarium. His knowledge of Old-World orchids was unsurpassed and he was a prolific author of authoritative accounts of the orchids of

both regions. His knowledge of European orchids encouraged Desmond Meikle, a senior colleague, to ask him to author the orchid account for the second volume of his *Flora of Cyprus* (1985). He worked closely with many regular European orchid specialists, including Derek Turner Ettlinger, David Chesterman, David Lang, Tom Norman and Paul Harcourt Davies. *Inter alia* he described *Ophrys fuciflora* (as) subsp. *chestermannii* and *Ophrys sphegodes* subsp. *aveyronensis*.

Jeffrey was introduced to Asiatic orchids in 1976 when he joined Martin Sands, a senior colleague, on a tough three-month expedition to Manus island and New Ireland in Papua New Guinea. The fine collections from these remote and previously almost unexplored islands now grace the Kew Herbarium. They include many novelties several of which were described as new to science by Jeffrey. Later expeditions, in Sumatra and Thailand with Jim Comber and in Borneo with Tony Lamb, enhanced his already substantial knowledge of the orchids of the region. Jeffrey developed an encyclopaedic knowledge of tropical Asiatic orchids over the years. He worked closely with Gunnar Seidenfaden, the eminent Danish diplomat and botanist, and collaborated with him on the substantial *The Orchids of Peninsula Malaysia and Singapore* (Olsen, Copenhagen, 1992).

On his visits to Sabah he met and began lengthy collaborations with Chan Chew Lun, Tony Lamb and Professor John Beaman, the last seconded from his university in Michigan to the University in Kota Kinabalu. John started his monumental account of *The Plants of Mount Kinabalu* and Jeffrey coauthored the orchid account (Wood, J.J., Beaman, R.S. & Beaman, J.H. 1993. Royal Botanic Gardens, Kew). This was eventually expanded into the magnificently illustrated two-volume account of the mountain's 850 or so orchid species for which he was the lead author (Wood, J.J., Beaman T.E., Lamb, A., Lun, C.C. & Beaman J.H. 2011. *The Orchids of Mount Kinabalu*. Natural History Publ., Kota Kinabalu, Sabah) which was published by Chan Chew Lun's publishing house. In this productive period Jeffrey co-authored *A Checklist of the Orchids of Borneo* (Wood, J.J. & Cribb, P.J. 1994. Royal Botanic Gardens, Kew). This was followed shortly afterwards by a further collaboration for *The Orchids of Sarawak* (Beaman, T.S., Wood, J.J., Beaman, R.S. & Beaman, J.H. 2001. Natural History Publications, Kota Kinabalu, Sabah & RBG Kew), another magnificently illustrated and authoritative work. In 2004, Chan Chew Lun asked Jeffrey to edit and contribute to a new journal, the *Malesian Orchid Journal*, devoted to the orchids of South-East Asia. Jeffrey accepted and edited the first 10 volumes to a high standard. The series continues to the present day under the editorship of Andre Schuiteman, Jeffrey's successor as orchid curator at Kew. He was a major contributor to the four volume series *Orchids of Borneo* where individual species were considered in detail (Four vols. 1991-2003. Natural History Publications, Kota Kinabalu and Royal Botanic Gardens, Kew).

His interest in British, European and Mediterranean orchids continued throughout this period, sustained by annual holidays in France and elsewhere in the Mediterranean where he could indulge his passion for plants and plant hunting. For many years he was the Botanical Society of the British Isles orchid specialist, identifying members discoveries and queries. As he approached his retirement, he received the Orchid Society of South-East Asia's fellowship and medal for his work on South-East Asian orchids, an award richly merited. Jeffrey retired to Bristol in 2012 to follow his passion for gardening and travel, albeit far too briefly. His occasional trips to London were to meet up with his old friends from South-East Asia when they visited Kew and former colleagues. His contribution to our knowledge of Asiatic orchids has been substantial and he will be sorely missed by his friends and colleagues.

HOS Video Competition 2019

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

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

For 2019 entries must be sent in advance by August 15th to the Video Competition Organiser Steve Pickersgill, either by email (hosvc@hardyorchidsociety.org) or for larger files, using one of the free transfer services such as WeTransfer or Dropbox. The Video Competition Organiser will supply instructions for using WeTransfer on request.

Marsh-orchids of North Uist

Tarmo Pikner

Just after my successful orchid trip to Wales and Ireland (together with Simon Tarrant, Sue Parker and Pat O'Reilly) I visited North Uist last year on June 16-17. My target for the whole trip was to determine and gather knowledge on taxa of the genus *Dactylorhiza* growing in the British Isles, preparing material for my book "*Dactylorchids of North and West Europe*". In conclusion I'm happy to declare that I almost fulfilled the target, finding 80% of the previously described Dactylorchid taxa of the region. North Uist is world famous for the appearance of Hebridean Marsh-orchid and this was my main target there. As I was provided with a precise situation map on habitation of Dactylorchids by Jon Dunn from Shetland, my mission was relatively easy.

Without sliding into the everlasting dispute on controversial taxonomic ranking of genus *Dactylorhiza,* I will just mention my own position on taxonomy, as I adhere to the Baltic School. The basic unit of taxonomic classification is the species. In some cases, the infraspecific taxa could be ranked as varieties, whereas the subspecies level is not used. The rank of forma is used for characterising polymorphism within populations, mainly noting hypochromic and hyperchromic individuals. In the Baltic School, much based on the historical works of J. Klinge during 1893-1899, the colour of floral elements i.e. quantity of contained anthocyanin, is not used as a primary character and different colour morphs are treated at the forma level within populations.

Various authors have described the flower-colour of the "*coccinea*" taxon of Early Marsh-orchid (*Dactylorhiza incarnata* ssp. *coccinea* or according to the Baltic School *Dactylorhiza coccinea*) differently: brick-red, deep-red, vermilion, cinnabar, crimson, carmine, warm-red, vivid-red, blood-red, scarlet – all kinds of red-basic colours. However, the colour has not been characterised on the pink-purple scale, which is used for almost all the other Dactylorchids (except yellow and white flower-coloured taxa). The flower-colour of "*coccinea*" is extremely stable and varies slightly only between big populations of different areas. In my experience those in Wales (Anglesey, Dyfi) could be described as bright scarlet but in North Uist as dull scarlet. Arguably "*coccinea*" is the only taxon (in my knowledge) that could be identified by the flower-colour as no others have the same colour tone. Notably, this contrasts with the use of a purple flower colour to define the "*pulchella*" taxon of Early Marsh-orchid in the British Isles. In his various *JHOS* articles, John Haggar (Haggar, 2018) has discussed in detail the taxonomy of purple colour morphs of *D. incarnata*.

Now I will address the great rarity of North Uist – Hebridean Marsh-orchid. Bateman (2012) defined the taxon as *Dactylorhiza traunsteinerioides* ssp. *francis-drucei* var. *ebudensis* although following the Baltic School, I will here refer to it as *Dactylorhiza ebudensis* or simply "*ebudensis*". The habitat of endemic Hebridean Marsh-orchid is restricted to 5 or 6 very small satellite populations with few plants (6-10 specimens). They are in about the centre of a bigger metapopulation of some 4-5 ha of coastal pasture approximately 4 km SW from Port nan Long in the north of the island. The vegetation is strongly associated with a maritime climate confined to the island's Atlantic coastal area. The precise habitat is the machair, a fertile calcium-rich, shell-sandy-soiled dune grassland, covered with species-rich low grass. It is mainly grazed by cattle and the area is divided into several pasture plots by wire fences.

Fig. 1: *Dactylorhiza ebudensis* dune-pasture biotope in North Uist
Photo by Tarmo Pikner

The whole pasture area is covered by a "carpet" of *D. coccinea* (*Dactylorhiza incarnata* ssp. *coccinea*), many thousands of plants with flower-colour I describe as dull scarlet. Another slight difference compared to the Welsh "*coccinea*" is the height of the plants, in North Uist they are more squat and shorter. It is as if they are pressed closer to the ground by the rough maritime climate making the flower spike shorter and somewhat more pyramidal. Among the thousands of "*coccinea*" Early Marsh-orchids I found only some tens with pale-pink flowers and none with purple flowers. Into the "*coccinea* carpet" there are "stitched" hundreds of Northern Marsh-orchids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(*D. purpurella*), which are of course shorter (half the height of Dyfi's plants) but still a bit taller than the rare "*ebudensis*". One could imagine that in some cases misidentification could happen when small *D. purpurella* might be regarded as "*ebudensis*", especially when one meets some Northern Marsh-orchids with spotted leaves (I found some tens). The key to separate these is that the leaf-spotting of *D. purpurella* is nothing like the heavily marked leaves of "*ebudensis*". Here we can exceptionally use the flower-colour principle (as the taxa are growing side by side in the same biotope). *D. purpurella* flower-colour is bright crimson while *D. ebudensis* has deep purple-magenta flower-colour. The main defining character is shape of the lip, which is diamond-like in *D. purpurella* with upwards bending side lobe edges, while the lip is reverse-heart type with broad side lobes in "*ebudensis*."

In the very centre of the turf-carpet of the machair habitat, in about a 200 × 200m quadrat of grassland, were growing about 60 authentic "*ebudensis*" plants in small groups. The same number of similar but distinct specimens could be determined as hybrids of "*ebudensis*" with neighbouring Dactylorchids (most probably with Northern Marsh-orchid). *D. ebudensis* belongs among the localised allotetraploid post-glacial endemics which evolved far from the glaciation extent margin in the previously glaciated areas and they are restricted to marginal niches in coastal areas and islands. These localised endemics are *D. ebudensis, D. osiliensis, D. baltica* var. *kuzkenembe, D. vironii* and *D. ruthei* and they are the youngest taxa among the controversial allotetraploid Dactylorchids (Pikner 2014).

Usually Marsh-orchids grow in swamp, boggy and fen biotopes, dependent on ground water but "*ebudensis*" grows in dune grassland, fed mainly by rain water. The precise habitat is in fact a combination of a dune biotope and machair (a coastal fertile grassland on blown sand) and this is a transition habitat. The machair is not flooded by seawater as it is situated higher on a sand bank but this is influenced by wave splash and sea-spray encouraging salt-tolerant species. There are no ordinary flooded dune slacks but rather plain pasture areas between the dunes. I believe that the calcareous soil could be at least partly neutralised by acidic rainwater. As epigenetic studies show (Paun *et al*. 2010), "*ebudensis*" in this habitat, formed no more than 2,500 years ago after recession of the Weichselian ice sheet, has narrow tolerances for both soil moisture and pH (which is 7-8), strongly related to water availability and temperature.

Fig. 2: Bright scarlet *Dactylorhiza coccinea* in Wales, Dyfi.
Fig. 3: Dull scarlet *Dactylorhiza coccinea* in North Uist.
Fig. 4: *Dactylorhiza purpurella* young plant.
Fig. 5: *Dactylorhiza purpurella* young plant with spotted leaves could be erroneously identified as *D. ebudensis*.
Photos by Tarmo Pikner


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Whilst watching ruminating cattle in the neighbouring plots of the pasture (maybe also eating "*ebudensis*" plants), some thoughts were raised. Is the Hebridean pasture sustainable for the survival of the endemic species even though the area is covered by NATURA 2000 as "Atlantic salt meadows"? At least the first leaves of almost all the specimens appeared half-eaten, most probably by cattle. It must be pointed out that the very rare endemic taxon of *Dactylorhiza ebudensis* needs proper protection measures because we do not have thousands of specimens but only hundreds or maybe tens.

Morphological characters of Hebridean Marsh Orchid *D. ebudensis*
Dactylorhiza traunsteinerioides* ssp. *f*rancis-drucei var. *ebudensis

Very squat in appearance, stem slightly hollow, in 2/3 towards tip heavily washed with brownish-purple, height 4-9 cm. 2-4 oblong-lanceolate sheathing leaves marked with large purple-brown blotches (not spots) on upper side, sometimes entirely washed purple-brown, edged with purple, gathered at base of stem, spreading to half erect, curved, convexly channelled, longest leaf 5-7 × 1-1.5 cm, a single lanceolate non-sheathing leaf. Bracts lanceolate, shorter than flowers, lower ones slightly longer, entirely dark brownish-purple, strongly curved inside. Ovary ribbed, twisted, heavily washed brownish-purple. Inflorescence short, dense, loose-scattered, mainly one-sided, 5-18 comparatively big flowers. Sepals and petals elliptical, lateral sepals asymmetrically erect and spotted, upper sepal (which extends over petals) and petals (shorter) form a hood over the column. Lip reverse-heart type, clearly 3-lobed, median lobe longer than side lobes and comparatively wide, side lobes orientated clearly downwards, sometimes small teeth in side lobes, tangibly broader than long, 6-8 × 9-12.5 mm, convex in middle, deep purple to magenta, heavily covered unevenly over the lip with dark-purple continuous and fragmentary stripe-pattern, whiter towards throat of spur with little spots. Spur longer than ovary, almost straight, slightly orientated downwards, cylindrical, tangibly thick, 9 x 3 mm.

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Figs. 6 & 7: *Dactylorhiza ebudensis* plants
Figs. 8 & 9: *Dactylorhiza ebudensis* inflorescence.
Photos by Tarmo Pikner

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Practical orchid conservation in Cumbria

Alan Gendle

I'm sure you must at times have had instances where you have travelled to an orchid site to see some unusual or rare orchid only to find the plant damaged. This happened to me in the late 1990's on several occasions. Predation takes many forms, trampling by cattle and humans, being eaten by wild animals, attacks by aphids and slugs. I found a population of *Pseudorchis albida* (Small-white orchid*)* on an SSSI was being regularly predated by cattle eating or trampling the plants. I would regularly see 20 odd animals grazing a few hectares of the SSSI. I approached English Nature about doing something to protect the plants. It was not possible to remove the cattle as they were on common land. They encouraged me to cage the plants. After several unsuccessful designs I evolved a design that worked. The cages allow access for pollinators but stop cattle predating the orchids. The *Pseudorchis* population is still surviving on the site after 20 years.

Fig. 1 (above): Cages to protect orchid plants.
Fig. 2: Dactylodenia hybrid.
Fig. 3: *Epipactis atrorubens* var. *albiflora*
Fig. 4: *Epipactis atrorubens* var. *pallens*
Fig. 5: *Epipactis* ×*schmalhausenii*.
Photos by Alan Gendle & Grahame Preston (Fig. 3)


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Fig.6: Predation by Roe Deer.
Fig.7: Hare browsing.
Photos by Alan Gendle

Years later I found a rare and beautiful Dactylodenia hybrid, *Gymnadenia borealis* × *Dactylorhiza incarnata* ssp *pulchella* on another local SSSI. After observing the plant regularly for a few years, I was horrified to find it had been eaten off to ground level by the Fell ponies that graze the area. After five years it reappeared in a dwarf form. I fitted a cage around it and it is now flowering again as originally found.

On the Limestone pavements of South Cumbria, the rare hybrid *Epipactis* ×*schmalhausenii* (Dark-red Helleborine × Broad-leaved Helleborine) can be found occasionally. On the pavements predation of all *Epipactis* species takes place by hares, deer, aphids and slugs. Working with Bryan Yorke the local wildlife expert, we have built and installed cages around the *Epipactis* hybrids. In the same general area interesting varieties of Dark-red Helleborine, varieties *pallens* or *lutescens* with bright yellow flowers and the variety *albiflora* with white flowers have been found recently. These varieties have also been caged and are surviving. We have also protected some *Epipactis phyllanthes* (Green-flowered Helleborine) but the slugs seem to be winning on this one at the moment.

Cumbria Wildlife Trust were only too pleased to provide off cuts of wire fencing to make the cages especially as they owned some of the sites mentioned. If you have orchids that are in need of protection why not have a go and make some cages and protect your local plants? Before you do please check with the landowner. Cages can be a tripping hazards so perhaps consider marking them with an obvious tall cane or stick. I'm sure your local Wildlife Trust or Natural England would be willing to provide materials and help.

Field Trip to the New Forest
David Hughes

On a lovely summer's day on June 9th last year 18 members of the Society met at Wooton Bridge near Brockenhurst with the promise of a fine selection of orchid species and wet feet. After walking across dry and marshy heath studded with various shades of Heath Spotted-orchid we reached reedy Phragmites bog where the *Dactylorhiza incarnata* ssp. *pulchella* were more abundant than I had ever seen them. White forms which do grow here were not seen.

HOS Members looking for Early Marsh-orchids. Photo by David Hughes

Lesser Butterfly-orchid, *Platanthera bifolia* were very scarce when I researched the site earlier in the week, so we moved on to the lawns of Wilverley where the Butterfly Orchids grew in large numbers amongst the bracken and heather. A single Chalk Fragrant-orchid, *Gymnadenia conopsea* which I had seen there a couple of days earlier had disappeared, which was a shame as it is not recorded in the forest. It was close to the car park and probably picked.

We then moved on to the bog at Broadley, notable for swallowing HOS members whole in a previous year. This time we had no such disasters although Richard the previous rescuer was on hand. In this site the orchids grow on hummocks in the bog. Marsh Fragrant-orchid, *Gymnadenia borealis* had come into full flower, one Twayblade, *Neottia ovata* made up the numbers, Marsh Helleborine, *Epipactis palustris* was in good quantity but would not flower for another two weeks. In an alder copse was a good colony of Southern Marsh-orchid, *Dactylorhiza praetermissa* mixed with a few healthy plants with "*fuchsii*" spikes but ring blotched leaves. I wanted to call them Leopard Orchid, *Dactylorhiza pardalina* but Nigel our local expert happened to be passing and dismissed them as Common Spotted-orchid – how disappointing.

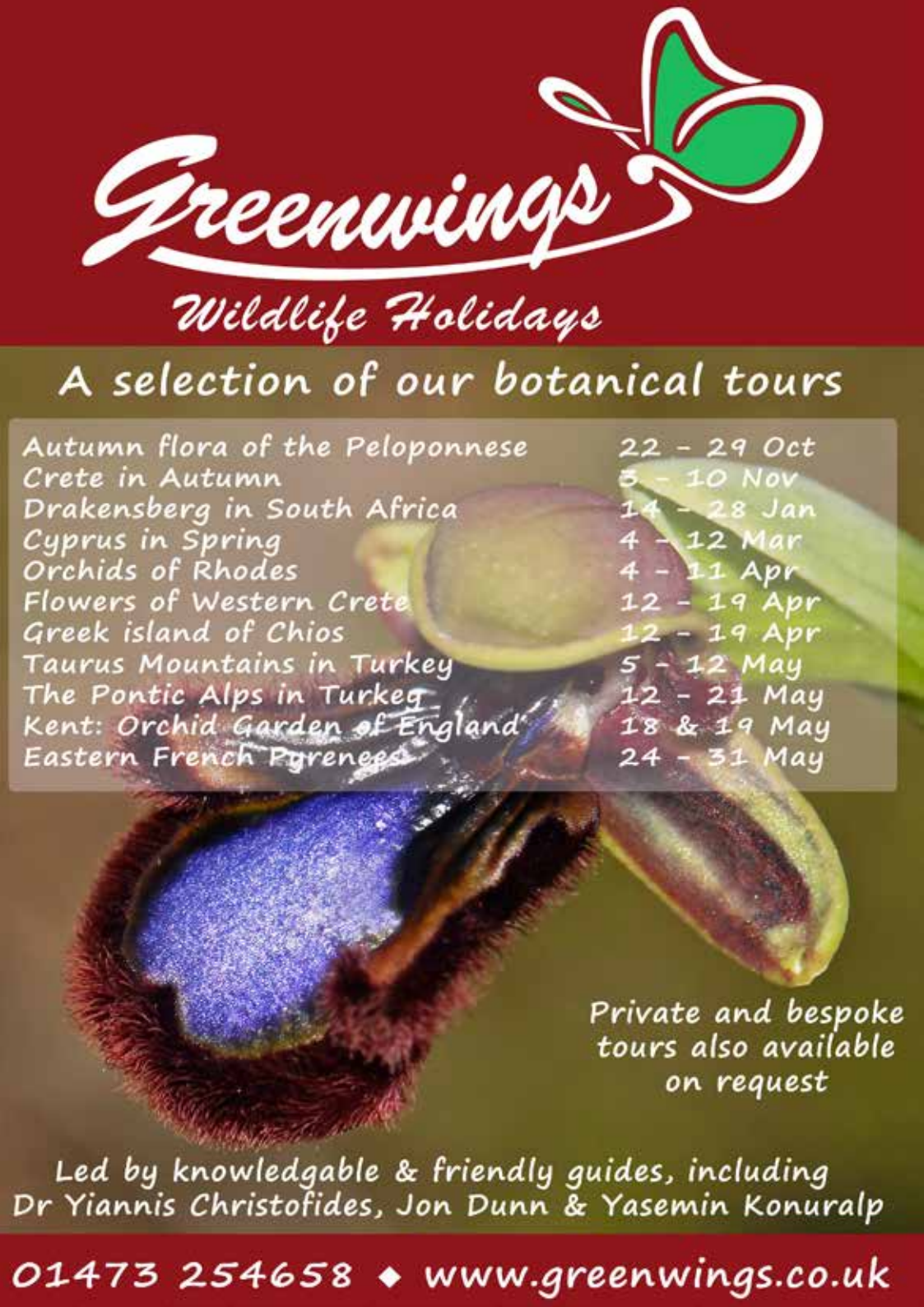
We hadn't quite finished as Christine had baked a cake so the company came back to Ringwood to eat it sitting next to pots of Northern Marsh-orchid, *Dactylorhiza purpurella* and then walk round our meadow which boasts a healthy population of Heath Spotted-orchids. So, we had a good day, saw an impressive list of species and had an opportunity to get to know the membership. I do hope more people will volunteer to run meetings next year, to my mind they are the most important thing the Society has to offer.

Greenwings

Wildlife Holidays

A selection of our botanical tours

Autumn flora of the Peloponnese	22 - 29 Oct
Crete in Autumn	5 - 10 Nov
Drakensberg in South Africa	14 - 28 Jan
Cyprus in Spring	4 - 12 Mar
Orchids of Rhodes	4 - 11 Apr
Flowers of Western Crete	12 - 19 Apr
Greek island of Chios	12 - 19 Apr
Taurus Mountains in Turkey	5 - 12 May
The Pontic Alps in Turkey	12 - 21 May
Kent: Orchid Garden of England	18 & 19 May
Eastern French Pyrenees	24 - 31 May



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Led by knowledgable & friendly guides, including Dr Yiannis Christofides, Jon Dunn & Yasemin Konuralp

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