

**Journal
of the
HARDY ORCHID SOCIETY**



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Front Cover Photograph

Pink Butterfly Orchid (*Anacamptis papilionacea*) with Dwarf Yellow Iris (*Iris pseudopumila*) photographed by Paul Harcourt Davies. See page 8 for Paul's article on Gargano.

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

Our first *JHOS* of the new year features two major but contrasting articles. It is good to have another contribution from Paul Harcourt Davis who played a significant role in establishing HOS in its early years. Paul is an internationally recognised orchid expert as well as an exceptional photographer and this time gives us an account of Gargano in his now native Italy. As always, this is filled with examples of Paul’s outstanding orchid photography and we have tried to give the space that it warrants.

David Trudgill is also a regular, but more recent, contributor and provides us with another of his thoughtful accounts with an analysis of how orchid numbers have changed since 1950.

The issue includes a first report from last year’s field trips with an article on Cumbria from Carol Armstrong & Alan Gendle. A more comprehensive field trip report compiled by Richard Kulczycki is planned for the next *JHOS* and this will also feature winning photographs from the 2022 Photographic Competition. Also, note news of the early field trips for 2023 that are included in this issue.

Chairman's Note Carol Armstrong

Happy New Year to you all. As the days lengthen, I expect many of you are contemplating 2023 plans involving orchid holidays, shows and meetings. I hope that you will be joining walks and the meetings offered by the Hardy Orchid Society during the year as well. Please check the website and listings in this journal for activities that interest you. If you are journeying away from the UK, then I hope that you have a great trip and that you might want to share your experience on the forum, at a meeting, or send photos to our competitions. Can I ask that you think about supporting the running of the society, by volunteering to help with organising the video competition or with the projectionist role at the indoor meetings or coordination of the electrical safety checks. Further details from any Committee Member. Also, a reminder about the 2023 HOSCG for which the application deadline is February 28th. Details are on the website. Whilst this issue is our winter edition, it will not be long until the start of spring. Enjoy!

Early 2023 Field Trips

Saturday 26th March: Oxfordshire, near Didcot

Leader: Hamza Nobes

Email: hamzanobes@hardyorchidsociety.org

To see the Giant Orchids (*Himantoglossum robertianum*) discovered last year. Short easy walk (10 min). One or two orchids should be near the path but most are down a very steep grass bank which requires care and firm footwear.

Saturday 6th May: the Chew Valley, North East Somerset

Leader: Rich Mielcarek

Email: RMielcarek@hardyorchidsociety.org

We have been given permission for a small party to visit a private SSSI meadow with a population of several thousand Green-winged Orchids, *Anacamptis morio* in a good variety of colours. The flat site, just south of Bristol, has car parking and no stiles. This will be a morning only meeting.

HOS Field Trips

We always need new ideas for trips, as well as new leaders. Or you might know a site warden who welcomes small visits by interested naturalists. We want to help new generations develop their enthusiasm for and knowledge of our wild orchids. Help spread the love!

Email Richard Kulczycki: hosft@hardyorchidsociety.org

HOS Meetings 2023

Southern Spring Meeting, Kidlington

Sunday 16th April 2023

Contact Organiser: Email hosos@hardyorchidsociety.org

Northern Meeting, St. Chad's, Leeds

Saturday 2nd September 2023

Contact Organiser: Email hoson@hardyorchidsociety.org

Southern Autumn Meeting, Kidlington

Sunday 19th November 2023

Contact Organiser: Email hosos@hardyorchidsociety.org

2023 Plant Show Information

The 2023 Plant Show will be held during the Southern Meeting at Kidlington on Sunday 16th April 2023.

Entries should be submitted to the show secretary, Neil Hubbard (contact details inside the front cover) by Wednesday 12th April, stating which Classes and how many entries for each Class you would like to enter. Late entries will be accepted on the day. Details of the Classes and Rules can be found on the website.

HOS Seed Sowing Workshop

Sunday 20th August 2023

Hagbourne Village Hall, East Hagbourne, OX11 9LR

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

For enquiries or queries Email: moira.tarrant@outlook.com

Cumbria Field Trips in June 2022

Carol Armstrong & Alan Gendle

On Saturday 25th June the party departed Tebay and headed out to the narrow lanes north of the village. The first stop was by a wide verge on which grew *Dactylorhiza purpurella* and *Gymnadenia borealis*. A single hybrid between the two (\times *Dactylodenia varia*) was seen. Travelling further along the lane we found more *D. purpurella* and *Dactylorhiza fuchsii* and many *Dactylorhiza* \times *venusta* hybrids. Common Twayblades (*Neottia ovata*) were growing in the long grass on the verges. Exploring the Tarn moor area there were more interesting *Dactylorhiza* hybrids: *D. purpurella* \times *Dactylorhiza incarnata* var. *incarnata* (*Dactylorhiza* \times *latirella*) and *D. purpurella* \times *Dactylorhiza maculata* (*Dactylorhiza* \times *formosa*). *D. incarnata* var. *incarnata* was present in both purple and pale forms as well as *D. incarnata* var. *pulchella*. Two more *Dactylodenia* hybrids were found. Both were \times *Dactylodenia varia* but one plant had *Dactylorhiza* as the seed parent whereas in the other, *Gymnadenia* was the seed parent.

Next stop was Little Asby Inrakes & Outrakes SSSI. The orchids were much as seen previously; mainly *D. purpurella*, *D. maculata* and *G. borealis*. *Dactylorhiza* \times *formosa* hybrids were again present. We searched the last known location for the Small-white Orchid (*Pseudorchis albida*) but none were found – it has been absent for 3 years. Final stop was the south end of Smardale NNR. On the cuttings a population of *D. purpurella* var. *cambrensis* was in full flower. The spots and dashes on the stem and dots on the back of the bracts were visible on the plants.

On Sunday 26th June the trip took us to Cumbria Wildlife Trust's Waitby Greenriggs reserve. Sightings were made of *D. purpurella*, *D. fuchsii* and *N. ovata*. A very attractive *D. fuchsii* var. *rhodochila* was in flower on the edge of one of the paths. *Platanthera bifolia* was flowering on the bed of the old railway tracks. Bee orchids (*Ophrys apifera*) and Fly Orchids (*Ophrys insectifera*) were flowering on the banksides. Finally, a new *Dactylodenia* hybrid between *G. conopsea* and *D. fuchsii* (\times *Dactylodenia heinzeliiana*) was flowering in two places. A few plants of Marsh Helleborine (*Epipactis palustris*) were starting to flower here and there.

Fig. 1: \times *Dactylodenia heinzeliiana* (*G. conopsea* \times *D. fuchsii*).

Fig. 2: \times *Dactylodenia varia* (*G. borealis* \times *D. purpurella*; seed parent is *G. borealis*).

Fig. 3: \times *Dactylodenia varia* (*D. purpurella* \times *G. borealis*; seed parent is *D. purpurella*).

Fig. 4: *Dactylorhiza fuchsii* var. *rhodochila*.

Photos by Alan Gendle (Figs. 1, 3 & 4) and Phil Smith (Fig. 2)

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Gargano – Forty Years On and Even More

Paul Harcourt Davies

Our perception of the passing of time changes as we get older and time flies – *tempus fugit*. The ageing process for me is one thing but living in Italy for the past 19 years makes me wonder where on earth that time has gone; until I think of all the years spent on the renovation of an old farmhouse in addition to trying to work.

Early Days – the Genesis

My first visit to the Gargano peninsula in Puglia, southern Italy in April 1980 was to gain material for the book I was writing: ‘*Wild Orchids of Britain and Europe*’. In the time since it has become something of a springtime magnet for people interested in discovering its astonishing wealth of wild orchids which can occur often in large populations with numerous species and a plethora of endemics, hybrids and aberrant forms. Over the years I have taken thousands of images, written reams and led numerous tours and workshops, all focused on Gargano.

In the mid-1970s, during the endless hours I spent researching in the libraries at Kew, I was particularly drawn to a set of three volumes ‘*Orchideen Europas*’ by Othmar and Edeltraut Danesch, copiously illustrated with photographs of orchids over which I could only drool. In the second volume (*Sud Europas*) which mainly dealt with *Ophrys* and *Orchis* (before the splitting of the genus) the data accompanying so many photographs carried the legend “Gargano peninsula”. Thus, it was in the spring of 1980 that we flew to Palermo, sampled maniacal Sicilian driving for the first time and then headed up the toe of Italy across to the heel of the boot and on to the rocky limestone spur that is Gargano.

Serendipity has always proved to be a valued personal friend and, as we drove onto the peninsula from the south, I took a chance turning to follow a railway cutting through the limestone near Manfredonia; a nose for orchids suggested that this could be a likely place. There was a quarry in which innumerable spikes of various *Ophrys* related to the early spider orchid (*Ophrys sphegodes*) were flowering in veritable drifts. Amongst them, standing out like beacons, were three flowering stems of what became my favourite of all the insect mimics, the Siponto *Ophrys* (*Ophrys sipontensis*) which has pink tepals contrasting with the rich walnut brown lip carrying

Fig. 1: The high parts of Gargano are extensive fields strewn with stones where bulbous plants thrive in a natural rockery. Here we caught the flowering of the dwarf yellow iris (*Iris pseudopumila*) at its best. Just a week later they were over.

Fig. 2: Very few places that are cultivated have escaped the deep plough but there are still fields in Gargano where wild yellow tulips (*Tulips sylvestris*) grow.

All Photos by Paul Harcourt Davies



a pattern of two iridescent blue lines. I had dreamed of one day seeing this orchid after it had seemed to call out from within the pages of the Danesch book. The fact I found it was a complete fluke for during that visit I found it in only in one other place, appropriately in the region of what was once the Roman port of Siponto, from whence it takes its name. Since then, I have found thousands but it can prove elusive as many people who go to Gargano merely on spec have found as the distribution is limited to the drier southern slopes.

At that stage in my life I had no inkling of how things would eventually turn out and certainly not that in November 2003 life would change completely when I moved lock, stock and filing cabinets to Italy. Nowadays, we can get to Gargano in just over four hours by hurtling along Italian motorways or slightly longer through the mountains. This has resulted in numerous trips at all times of the year – not just for orchids but for numerous other flowers that grow there, for insects, superb walking and enjoying the company of people such as Matteo Perilli and Leo Battista. They share our passion for orchids, for photography and a mutual love of Gargano where they were born and brought up. They have done a great deal to reveal the treasures of their part of the world and encourage its protection and preservation. I have helped wherever and whenever I could. I'm not sure exactly how much time I have spent exploring that part of the world and following every track I could find. However, I think there have been more than 50 visits and those are usually at least a week in length (often more). So I'm in the lucky position of having spent well over a year of my life exploring Gargano and being surprised and delighted every time I go there.

Where and what is Gargano

Gargano is a massive lump of limestone that forms the 'spur' on the boot of Italy. The National Park occupies some 120,000 ha and is isolated from neighbouring land masses. The Murgia hills lie some 40 km away to the west and this relative isolation has enabled orchids and other plants to evolve separately from their nearest mainland relatives. It was once an island off the Dalmation coast that moved on its tectonic

Figs. 3 & 4: Siponto Ophrys (*Ophrys sipontensis*; synonymous with *O. sphegodes* ssp. *sipontensis*) is a rare endemic orchid species restricted to a limited area near Manfredonia and Monte St Angelo in the Gargano peninsula. The species is morphologically similar to *Ophrys spruneri* from Greece but the two are not genetically related although they have the same hymenopteran pollinator *Xyloscopa iris*. Its visual requirements, however exaggerated, for a 'mate' have facilitated natural selection with consequent parallel evolution.

Figs. 5 & 6: Apochromic (lacking anthocyanin pigments) Gargano Ophrys (*Ophrys sphegodes* ssp. *passionis* – also *O. garganica* or *O. passionis*). Occasional plants occur throughout the range of many *Ophrys* species where flowers lack the usual anthocyanin colouring pigments.

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plates and gradually the channel between ‘island’ and land silted up and became the agriculturally productive plain of Foggia where there are salt pans with amazing birds, nesting storks and much more.

Gargano is certainly not a wilderness in the accepted sense of the word yet at close quarters it is, with a myriad mini worlds, existing in its karstic limestone pavements. There is limited tourist development near the coast, where Aleppo pines descend from white calcareous cliffs to the sea and the waters are a deep azure blue. Inland, however, Gargano is sparsely populated since much of the interior is upland landscape, threaded with miles of ancient stone walls and peppered with conical dwellings. The design of the ‘trulli’ dates back to the stone age when the local inhabitants cleared fields for subsistence farming and had to do something with those rocks, after all. By the time sun-seekers arrive the land is desiccated and orchid tubers have a period of summer dormancy (aestivation) protected by hard-baked, clay-like soils around them. The first few drops of autumnal rains that manage to penetrate stimulate vegetative growth again and leaf rosettes begin to appear.

Humans and Gargano

The interaction of humans and the land fascinates me: sometimes, over-zealous (but well-meaning) conservationists forget the influence humankind has had on habitat diversity. The Gargano landscape would not exist, as it now does, but for human intervention over the millennia. Without traditional grazing by cows, that crop higher

Fig. 7: Small-patterned *Ophrys* (*Ophrys fuciflora* ssp. *parvimaclulata*) a subspecies of the Late Spider-orchid from S. Italy. It has a very restricted distribution in Gargano growing mainly on the north-facing slopes in just a few places.

Fig. 8: Conrad’s Orchid (*Ophrys conradiae*; synonymous with *Ophrys scolopax* ssp. *conradiae*) is a very rare orchid taxon found in Sardinia and in a few stations in Gargano. It is late flowering (May into June) and so most visitors do not see it

Figs. 9 & 10: Archipelago Orchid (*Ophrys archipelagi*; synonymous with *O. ×arachnitiformis* or *O. ×arachnitiformis* Nm ‘archipelagi’). This rare and local taxon is one of a group of similar ‘species’ in the Mediterranean region considered to have arisen from hybrids between various members of the *O. fuciflora* and *O. sphegodes* complexes and placed under the umbrella term *Ophrys archnitiformis*. The various taxa have formed partly stabilised populations and some authors (not this writer) consider them all to be separate species. Based on current DNA analysis it seems sensible to recognise morphological differences but class them as notomorphs. There are often problems with precise identity and thus in giving names because of F1, F2 and F3 hybrids playing a role with crossings and back-crossing. Thus the plants illustrated belong to *O. ×arachnitiformis* Nm ‘archipelagi’ a local taxon from Gargano.

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than sheep and goats and leave orchid and other plant leaves intact, parts of Gargano would rapidly become devoid of plant variety. Flowering from one year to the next is greatly influenced by the onset of spring and exactly when animals are put out to pasture. On the heights, with their sparse soils, there is little competition from other plants and so wild orchids and numerous bulbous species (tulips and irises) flourish. Floral displays are often a feast for the eyes revealing Mother Nature, the gardener, at her best.

Getting The Best from Gargano

There is a wonderful beech forest at high altitude, the Foresta Umbra, that is maintained under the control of the Corpo Forestale and grazed by cows leaving it carpeted in spring with blue, white and magenta anemones, white narcissus and yellow orchids. Bird life is extraordinarily rich with five species of woodpecker, goshawk, eagle owls, hoopoe and golden oriole. Although the richness of Italian history is famed through the world, its astonishing natural history is not. Much as I love the classical history, Italy has always been synonymous with incredible displays of wildflowers through spring and early summer.

To get to the best areas on Gargano you have to wander off the beaten track and through countryside rich in wild irises where you find both the dwarf yellow *Iris lutescens* (*Iris pseudopumila*) and the taller, scented, *Iris bicipitata* (mainly dark blue but also light blue, yellow and white a Gargano endemic). This is no chore when, in dozens of ancient, stone-walled and limestone-strewn fields between Monte St Angelo and San Giovanni Rotondo, for example, you can find literally thousands of *Ophrys* and drifts of *Anacamptis papilionacea* and *Anacamptis morio*.

Fig. 11-12: The Giant Orchid (*Himantoglossum robertianum* formerly *Barlia robertiana*) usually occurs in shades of pink and brown but occasional specimens can be found where the reddish colouring from the anthocyanin pigments is absent. It appears on occasions in late December and is flowering throughout January into April depending upon altitude. It is an imposing species with numerous flowers that carry a sweet, iris-like scent.

Fig. 13-14: Apulian Ophrys (*Ophrys fuciflora* ssp. *apulica*; synonymous with *O. holoserica* ssp. *apulica* and *O. apulica*) is one of the larger and more showy taxa in the *O. fuciflora* complex. The lip is large with prominent horns as side lobes and a marked apical protuberance. It flowers in full sun in limestone grassland, stony places, garigue and light forest up to around 900m It is endemic to S.E Italy and is particularly magnificent in the Gargano peninsula. Its pollinator is the bee *Eucera rufa*.



Whenever we lead tours and run workshops we endeavour to help participants begin to see the wider picture in order to gain an insight into the way that nature works. It is not merely a case of finding new species and hybrids to photograph but of understanding where and how they grow, why numbers fluctuate, their life-cycles and the way they entwine with the whole ecosystem and last but not least how their distribution is entwined with human activity. Orchids are great indicators of healthy terrain because they cannot survive heavy cultivation and use of fertilisers or herbicides and thus, where they grow, many other species of flowers and insect will thrive, too. I have always considered that orchids act as a kind of ‘barometer’ for the state of the terrain; when local conditions change some species will disappear whilst others thrive.

Optimal flowering times are hard to predict reliably because they are greatly affected by the severity and the duration of a preceding winter (and even summer). No two successive years are the same – some winters can be extremely dry, others wet and there may or may not be snow on the heights. The equation becomes complicated but we have always tried to choose times for our visits so that, even in extreme years, we might catch the first orchids of a late year (such as 2022). In an early year, we move higher up the mountain where one can usually find something in flower. The difference creates new experiences for in 2022 we found dozens of crocus, polyanthus narcissus, *Romulea* and others in bloom that had usually been over.

For this reason, we always arrive in Gargano a few days before any group we are leading to get a ‘feel’ for where the season is and any sites that have changed thanks to agriculture, fires or other causes. We want to make sure that participants get maximum ‘species value’ in terms of what we can show them. – not just orchids but a lot of other aspects of life in Gargano. The last thing any tour leader should ever say is “You should have been here last week”.

When we first moved to Italy my Italian was rudimentary. In fact, probably more rude than ‘mentary’ whereas Lois was fluent and had spent many years in Italy

Fig. 15: Gargano Ophrys (*Ophrys sphegodes* ssp. *passionis*; synonymous with *O. garganica* and *O. passionis*. f. *planimaculata*). This image is of an unusual flower where the usual ‘H’ shaped speculum has expanded to occupy the central part of the lip. Such forms are rare and not deserving of varietal status, hence f. *planimaculata*. The wide strap-like sepals of this taxon (usually brownish but also greenish) and the ‘H’ shaped speculum contribute to its distinctive appearance.

Fig. 16: The Mirror Ophrys (*Ophrys speculum*; synonymous with *O. ciliata*) is one of the most remarkable species in this insect mimicking genus. Small in stature it is easily overlooked but is widespread in the Mediterranean region with a very limited distribution in Gargano.

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managing walking holidays for high-end companies. I have learned too, helped by a reasonable knowledge of Latin kept up for botanical reasons. Whether leading trips, running workshops or on our own exploratory ventures, we can talk to people and Italians are naturally helpful. We have worked with friends all over Italy, helping with translations of books, encouraging and promoting young photographers, adding whatever weight we can to conservation projects. It was never done with any thought of return. Italians are generous people and this has been reciprocated through many kindnesses. We really love our adopted homeland and became Italian citizens in 2020 – we have had so much so we just want to put something back.

Gargano – The Orchid Mecca

There is a lively debate as to the exact number of species of orchid in Europe in general and in Gargano in particular, especially when it comes to endemics, those species and subspecies (taxa) unique to the peninsula or its near territories. An area like Gargano gives a sense of perspective when you can examine a myriad orchid flowers of the same species and thus get a feel for the innate variability, which can be considerable. Too often, extreme examples of a single species are conveniently selected, all intermediates are neglected, and a new ‘species’ is dutifully announced in a journal that is not ‘peer reviewed’. Once upon a time, I was deeply preoccupied with orchid taxonomy (particularly the genus *Ophrys*, those insect mimics) but this ‘trainspotting’ approach makes me despair.

Over the decades, there has been an increasing number of people visiting each spring, attracted by the orchid glories of Gargano. In the main, this is a good thing because there is a far greater local awareness that people are attracted to the region, not just for the beaches but outside the main holiday season when pickings from tourism have traditionally been pretty slim. In the right hands this can be used to influence decision-making by local politicians though, as with everywhere else, the greed of developers and their deep pockets tends to win. Substantially sized groups

Fig. 17: Lacaita’s *Ophrys* (*Ophrys lacaitae*) a rare, rather late flowering species found from May that is endemic to Sicily and parts of the S. Italian mainland, including Gargano. It is regarded as a subspecies of *O. fuciflora*.

Fig. 18: Cinnabar *Ophrys* (*Ophrys fuciflora* subsp. *cinnabarina*) is one of a number of very closely linked ‘species’ in the *Ophrys fuciflora* group. It is not recognised widely as deserving status separate from *O. fuciflora* and is another late-flowering species in Gargano appearing in mid May in very few places.

Figs. 19 & 20: Horned *Ophrys* (*Ophrys cornuta*; synonymous with *O. scolopax* ssp. *cornuta*). Sometimes it is known as *O. oestriifera* ssp. *montisleonis* in Gargano where it is extremely rare and localised. It is characterised by prominent horns as side lobes.

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arrive from all over Europe, intent on seeing orchids and sadly, each year, we see evidence of trampling where people unwittingly tread on many non-flowering plants, and, indeed flowering plants, as they take their turn with something that has been found. There is certainly not a deliberate intention to ruin places but people often do not realise their impact for the goal of the image they want is all. Balance, as HOS members who lead parties to orchid sites know well, is a difficult thing to maintain for people can cause damage, especially when they haven't 'got their eye in'.

Lois and I made a conscious decision years ago to keep numbers small with the venture we run together: a single minibus, perhaps. Unfortunately, there are fiscal realities when you want to maintain high standards. In addition, Lois makes great picnics and when it comes to evening meals she has spent years going into hotel kitchens, chatting with the personnel there and getting them on side with variety and price! In 2019, a year before lockdown hit, we began to cooperate with Matt Berry of Greenwings. He is very much on the same wavelength as far as love of nature goes. We subsequently ran a first post-lockdown trip in April 2022 – a season in which flowering times were at least a fortnight behind. Fortunately, we knew sites at lower altitude and spent a few busy days, travelling around and changing the itinerary. The result involved new places plus old favourites.

Since we live in Italy, that is where we have chosen to concentrate and our air fares do not have to be paid for by participants. The natural history side is mainly, but not exclusively, mine for Lois is very knowledgeable with an enviable ability for finding things. She has a deep knowledge of all things Italian: the history, architecture, culture, food and wine contribute greatly to an holistic appreciation of aspects of Italy people do not normally see. The historical heritage of Italy is justifiably famous throughout the world but the treasure chest of its natural assets is less well known. These aspects are all intertwined and we try to address this in a small way with love and respect for our adopted homeland.

Fig. 21: *Ophrys passionis* var *virescens* (synonymous with *O.garganica* ssp. *virescens*) is a race of the Gargano Ophrys (*O. passionis*) with a yellow-edged lip.

Fig. 221: Apulian Tongue Orchid (*Serapias orientalis* ssp. *apulica*) is a broad lipped taxon sometimes considered to be separate from *Serapias orientalis*. It is extremely local in Gargano and parts of Puglia.

Fig. 23: *Ophrys bertoloniiiformis* (synonymous with *O. bertoloni* ssp. *bertoloniiiformis*). The most recent view of a number of 'species' is that they are stable hybrid populations of various taxa in this case *O. bertolonii* and various *O. sphogodes* taxa (some of which are regarded as species).

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***Ophrys* Confusion**

Anyone who makes the mistake of thinking they understand the genus *Ophrys* needs to visit Gargano (numerous times) for it is a wonderful place in which to come to terms with the general capriciousness of those most intriguing of wild orchids. Not only is there a great variety of taxa but they are often present in large numbers (so you begin to appreciate natural variation) and there are also populations of their insect pollinators.

In the past, it has been fondly imagined that each “species” of *Ophrys* had its own unique pollinator. In Gargano, the remarkable photographs of Matteo Perilli have shown this to be far from the case and that a number of taxa share several pollinators. The result is that hybrids are more frequent than in many other areas. Not only are the orchids evolving but so are their pollinators in their particular requirements as far as the scents emitted by *Ophrys* flowers are concerned.

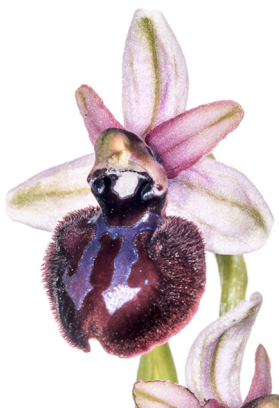
During the last few years numerous *Ophrys* hybrids have been noted and published from Gargano and other parts of southern Italy in a splitters’ delirium. However, I remain cautious about the identity of some of these because it is always problematic to name, with certainty, the putative parents when no genetic analysis has been done to try and establish them. All too often it results in guesswork, driven by the urge to discover something new and to name it. This might seem cynical to some people, but I have been seriously involved in the study of *Ophrys* for nigh on half a century throughout Europe and further east and gaining a synoptic view teaches caution. When people get interested in *Ophrys* they tend see hybrids everywhere, triggered by even the slightest morphological difference. We must never forget the innate capacity of a single *Ophrys* taxon to demonstrate considerable differences when it comes to colour of the tepals, patterns on the lip shape and size.

<i>Orchis, Anacamptis & Neotinia</i>		
<i>Anacamptis papilionacea</i> Pink Butterfly Orchid	<i>Anacamptis papilionacea</i> Pink Butterfly Orchid	<i>Orchis italica</i> Naked Man Orchid
<i>Orchis anthropophora</i> Man Orchid	<i>Orchis purpurea</i> Lady Orchid	<i>Orchis provincialis.</i> Provence Orchid
<i>Neotinea tridentata</i> Toothed Orchid	<i>Orchis coriophora ssp.</i> <i>fragrans</i> Bug Orchid	<i>Orchis collina</i> Hill Orchid
<i>Neotinia lactea</i> Milky Orchid	<i>Orchis pauciflora</i> Few-flowered Orchid	<i>Anacamptis morio</i> Green-winged Orchid
<i>Orchis quadripunctata</i> Four-spotted Orchid	<i>Neotinia ustulata</i> Burnt-tip Orchid	<i>Anacamptis morio</i> Green-winged Orchid





Ophrys promontorii
Promontary Orchid



Ophrys sipontensis
Siponto Orchid



Ophrys archipelagi
Archipelago Orchid



Ophrys parvimaculata
Small-patterned Orchid



Ophrys biscutella
Shield Orchid



Ophrys cornuta
Horned Ophrys



Ophrys apulica
Apulian Orchid



Ophrys apulica
Apulian Orchid



Ophrys bertoloniiformis
(*Ophrys* × *flavicans*
Nm *bertoloniiformis*)



Ophrys passionis
Gargano Orchid



Ophrys lutea
Yellow Ophrys



Ophrys bombyliflora
Bumble-bee Orchid



Ophrys atrata
Dark Orchid



Ophrys bertolonii
Bertoloni's Orchid



Ophrys lutea var. *minor*
Small Yellow Ophrys



Ophrys tenthredinifera
Sawfly Orchid



Ophrys tenthredinifera ssp. *neglecta*
Sawfly Orchid



Ophrys speculum
Mirror Orchid



I fully accept that there can be numerous different schemes for the taxonomic classification of *Ophrys* as humans try to impose a structure which nature does not care about. I favour the one in the excellent book ‘*Field Guide to the Orchids of Europe and the Mediterranean*’ by Kühn, Pederson and Cribb. It is a consistent system, based on solid phylogenetic work pioneered at the Jodrell laboratory. It does not raise all *Ophrys* to species level and the names allow you to make connections. Many of my Italian friends are splitters and we differ, but in friendly fashion! This is the approach I have followed for many years but appreciate that there are other views. For example, some think that a different pollinator or different distribution means a unique species.

A Philosophical Gulf – the Problem with Names

Long ago, I realised there is a deep-seated philosophical difference in approaches to taxonomy where ‘lumpers’ look for similarities and ‘splitters’ look for differences. The splitters tend to follow the approach of Emanuel Kant who believed ‘the theory’ was all and you looked for examples to fit, cherry-picking if you like, and ditching those that did not. It is an approach that seems to have gone out of fashion everywhere except in the taxonomy of *Ophrys* (and in Social Sciences dare I say!) It leads to a proliferation of names that often seem unrelated.

Lumpers follow the approach proposed by the philosopher David Hulme (and refined by Karl Popper and others) where the gathering of data and evidence begins the process and a theory is built from that. Time and again you test it and when things fall apart it is time for a new theory that not only fits the facts but predicts avenues of new research. Once upon a time, in a land far away, I trained as a theoretical physicist with a strong interest in the philosophy of science (who saw the light!) and so I like symmetries and logical structure. I have always felt that elegance and simplicity, as

<i>Ophrys</i> Hybrids & Varieties		
<i>Ophrys</i> × <i>permutata</i> <i>Ophrys biscutella</i> × <i>O. bertolonii</i> formes	<i>Ophrys</i> × <i>montis-angeli</i> <i>Ophrys biscutella</i> × <i>O. tenthredinifera</i>	<i>Ophrys</i> × <i>flavicans</i> <i>Ophrys bertolonii</i> formes × <i>O. sphegodes</i>
<i>Ophrys sipontensis</i> unusual green form	<i>Ophrys passionis</i> × <i>O. bertolonii</i> formes	<i>Ophrys passionis</i> ssp. <i>virescens</i>
<i>Ophrys</i> × <i>fajarama</i> <i>Ophrys gracilis</i> × <i>O. lacaitae</i>	<i>Ophrys</i> × <i>salentina</i> <i>Ophrys tenthredinifera</i> × <i>O. apulica</i>	<i>Ophrys passionis</i> lacking colour pigments
<i>Ophrys</i> × <i>corturi</i> <i>Ophrys apulica</i> × <i>Orchis passionis</i>	<i>Ophrys passionis</i> apochromic form where speculum covers lip	<i>Ophrys</i> × <i>lupiae</i> <i>Ophrys bertolonii</i> formes × <i>O. tenthredinifera</i>

far as it is possible, are important in communication and in understanding science. If things get too complicated then the chances are you're on the wrong track: Occam's razor rules! Nowadays, I really cannot get worked up in the emotionally heated manner in which some taxonomic debates take place where names are everything and the plants themselves are forgotten.

My bottom line is that I just love orchids, plants of all sorts and the things that crawl over them and fly above them and it gives me great pleasure to photograph them and to reveal, as best I can, what appeals to me. My possibly naive hope has been that in doing so it is possible to encourage interest and help make people aware of the sheer beauty of things around us that are worth protecting and preserving – too late to change now.

Changes in Orchid Numbers in England Since 1950

David Trudgill

Introduction

What do we really know about the status of our native orchids in England? Are all species declining and, if so, how rapidly? Or are some increasing and if so which ones and by how much? This article seeks to answer these questions for 34 species of orchids in England by using the records collected by the Botanical Society of Britain and Ireland (BSBI). The BSBI, partly through its network of Vice-county Recorders, continually surveys and updates information on the distribution of plants in the British Isles (<https://database.bsbi.org>). Their database now contains more than 50 million records. The records I have used for exploring changes in orchid abundance in England are mostly based on presence or absence in a tetrad (an area 2km × 2km). Records for hectads (an area 10km × 10km) were included in the totals if there were no tetrad records within them. The BSBI records are consolidated for sequential periods of time (viz. 1950-69, 1970-86, 1987-99, 2000-09 and 2010-19). As these periods differ in length I have calculated, and used, the mean annual numbers of tetrad records where each orchid species was recorded for each time period. For the orchids, I have not included species that are very rare (as these will tend to have been comparatively over-recorded) or where their identity/taxonomy has been confused. The data for the three species of *Gymnadenia* (Fragrant Orchids) has been consolidated as one 'species'.

Changes between 1950 and 2019 in numbers (per annum) of tetrad records for 34 species of orchids and total records for all plant taxa.

The total of the numbers of tetrads where each of the 34 species of orchids were recorded in England, expressed as the annual means of the five time periods, are in Table 1. These increased 3.6-fold from 808 per annum in the period 1950-69 to 2887 per annum in 2010-19. The corresponding total numbers (duplicates excluded) of all records collected annually for all plant taxa in England also increased (Table 1),

but the increase was proportionally much greater i.e. 11.8-fold from 103,900 records per annum in 1950-69 to 1,244,500 per annum in 2010-19 (Amphlett pers. comm.). These increases are attributed to progressive, but unquantified, increases in the intensity of recording. Consequently, it is not possible to use the numbers of orchid records in the BSBI database to determine directly changes in orchid abundance (Amphlett 2015).

	1950-69	1970-86	1987-99	2000-09	2010-19	Change
Orchids	803	1,466	2,079	2,443	2,882	×3.6
All taxa	103,900	258,500	556,000	687,200	1,224,500	×11.8
% Orchids	0.77%	0.57%	0.37%	0.36%	0.24%	×0.31

Table 1: Mean total annual numbers of tetrad records collected for 34 species of orchids in England for five time periods, the corresponding total numbers of records for all plant taxa and orchid tetrad numbers expressed as a percentage of the corresponding total records for all taxa. The last column gives the change between 1950-69 and 2010-19.

Changes in relative orchid abundance in England between 1950-69 and 2010-19
Methods

As in two previous article (Trudgill 2022 a & b), to allow for the increase in recording intensity, I have adjusted the orchid data by expressing the mean numbers of tetrad records for each orchid species as a percentage of the corresponding total numbers of records for all taxa. To determine the rate of decline of each orchid species between 1950-69 and 2010-19 I have then regressed the results for each species against the last date of each of the five recording periods (i.e. 1969, 1976 etc.). Both a linear and a negative exponential regression were fitted to each set of data but only the negative exponential regressions are presented here (Table 2) as this approach gave a better fit to the data for most species.

Results

There were major differences between orchid species in their rates of decline between 1969 and 2019, as measured by the exponent in the exponential equation for each set of data (Table 2). I have arbitrarily divided the results into those species that declined only slightly (exponent range -0.006× to -0.013×), those that had intermediate rates of decline (-0.020× to -0.039×), and those with high rates of decline (-0.040× to -0.067×). To provide a measure of the ‘goodness of fit’ of the negative exponential regressions to the data, I have also provided the R² value for each regression.

Species	No/yr 2019	Exponent	R ²
Low rates of decline:			
<i>Ophrys apifera</i>	324	-0.006×	0.45
<i>Dactylorhiza purpurella</i>	78	-0.007×	0.13
<i>Anacamptis pyramidalis</i>	289	-0.009×	0.75
<i>Dactylorhiza praetermissa</i>	1704	-0.013×	0.66
Intermediate rates of decline:			
<i>Dactylorhiza fuchsii</i>	620	-0.020×	0.94
<i>Epipactis helleborine</i>	184	-0.024×	0.96
<i>Dactylorhiza maculata</i>	124	-0.025×	0.91
<i>Orchis mascula</i>	305	-0.025×	0.95
<i>Spiranthes spiralis</i>	53	-0.026×	0.92
<i>Himantoglossum hircinum</i>	6	-0.027×	0.78
<i>Orchis purpurea</i>	5	-0.027×	0.79
<i>Epipactis palustris</i>	15	-0.037×	0.98
<i>Cephalanthera damasonium</i>	55	-0.028×	0.86
<i>Neottia cordata</i>	8	-0.029×	0.84
<i>Pseudorchis albida</i>	2	-0.031×	0.89
<i>Corallorhiza trifida</i>	1	-0.031×	0.73
<i>Neottia ovata</i>	223	-0.032×	0.96
<i>Ophrys sphegodes</i>	4	-0.032×	0.97
<i>Orchis anthropophora</i>	13	-0.032×	0.92
<i>Hammarbya paludosa</i>	5	-0.032×	0.85
<i>Epipactis atrorubens</i>	4	-0.035×	0.96
<i>Gymnadenia</i> spp.	69	-0.036×	0.99
<i>Platanthera chlorantha</i>	66	-0.036×	0.99
<i>Epipactis purpurata</i>	28	-0.037×	0.99
<i>Dactylorhiza incarnata</i>	34	-0.038×	0.97
<i>Anacamptis morio</i>	62	-0.039×	1.00
<i>Ophrys insectifera</i>	20	-0.039×	0.97
High rates of decline			
<i>Cephalanthera longifolia</i>	2	-0.041×	0.97
<i>Neottia nidus-avis</i>	36	-0.042×	0.99
<i>Goodyera repens</i>	1	-0.043×	0.93
<i>Dactylorhiza viridis</i>	19	-0.047×	0.99
<i>Neotinea ustulata</i>	5	-0.048×	0.96
<i>Herminium monorchis</i>	4	-0.050×	0.95
<i>Platanthera bifolia</i>	14	-0.051×	0.99

Table 2: Mean numbers of tetrad records collected in the period 2010-19 for 34 species of orchids, the exponent from the negative exponential equation (a measure of the slope/rate of decline), and the R² (a measure of the ‘goodness of fit’ of the regression to the data).

Rates of decline, as measured by the exponent, are presented in descending order (Table 2). *Ophrys apifera* (Bee Orchid) declined the least and *Platanthera bifolia* (Lesser Butterfly-orchid) the most. Four species were grouped as having low rates of decline (exponents ranged from -0.006× to -0.0013×) and, as measured by the R², an exponential regression provided a poor fit to the data i.e. these species were not declining exponentially. Twenty three species were classed as having intermediate rates of decline (the exponents ranged from -0.020× to -0.039×) and for the majority of these a negative exponential regression provided a good (R² = >0.90) or an excellent (R² = >0.95) fit to the data. Seven species were classified as having high rates of decline (exponents -0.040× to -0.051×) and a negative exponential regression gave a good or excellent fit to the data for all these species.

It is not possible to provide graphs for all 34 species but the graphs for four species are given to help visualise what the differences in the exponent and R² actually indicate. The graph for *Anacamptis pyramidalis* (Pyramidal Orchid) is given (Fig. 1) as an example of one of the four species with a low rate of decline. It is notable that the numbers of records of *A. pyramidalis* as a percentage of all taxa increased slightly after 1999 (Fig. 1). The graph for *O. apifera* was similar, but that for *D. praetermissa* (Southern Marsh Orchid) was close to linear (i.e. it appeared to slightly decline over the whole period from 1950-69 to 2010-19). The data for *Dactylorhiza purpurella* (Northern Marsh Orchid) was very scattered, as indicated by the very low value for R² and no conclusions can be drawn regarding its decline.

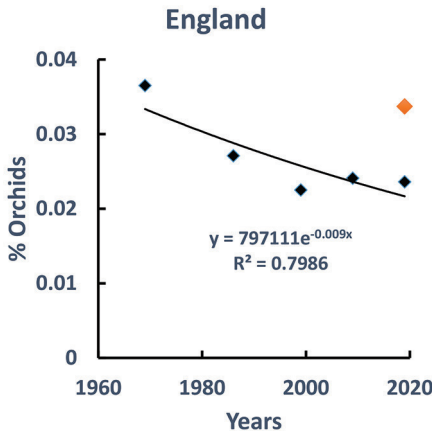


Figure 1: Relationship between numbers of tetrad records for *Ancamptis pyramidalis*, expressed as a percentage of the total for all taxa, regressed against time using the last date of the five recording periods. An exponential regression has been fitted to the data. See Discussion for derivation of the red diamond point.

The R^2 exceeded 0.90 for sixteen of the twenty three species that were categorized as having an intermediate rate of decline, and their graphs were all very similar, only differing in the steepness of the regression (as indicated by differences in the exponent). The graph for *Epipactis purpurata* (Violet Helleborine) is given as a typical example (Fig. 2). These species all declined progressively and continuously between 1950-69 and 2010-19.

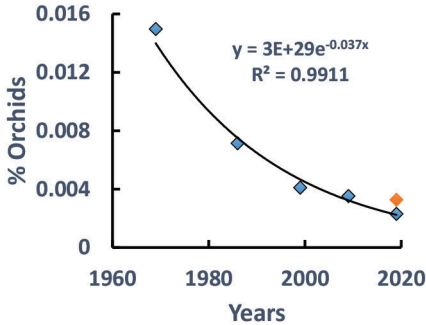


Figure 2: Relationship between numbers of tetrad records for *Epipactis purpurata*, expressed as a percentage of the total for all taxa, regressed against time using the last date of the five recording periods. An exponential regression has been fitted to the data. See Discussion for derivation of the red diamond point.

The graph for *Himantoglossum hircinum* (Lizard Orchid) is given as one example of a species with an intermediate rate of decline but an R^2 of less than 0.90 (Fig. 3). The graph indicates that *H. hircinum* had increased slightly since 1999. The graph for *Cephalanthera damasonium* (White Helleborine) was similar to that for *H. hircinum*. A negative exponential regression gave a poorer fit ($R^2 < 0.9$) to the data for seven species of the 23 species with an intermediate rate of decline largely because the % orchid value for the period 1950-69 was substantially less than that for 1970-86 (i.e. they appeared to increase between 1969 and 1986, but thereafter declined as for the other species in the intermediate group). It is not clear whether these species were under-recorded in the period 1950-69, or over-recorded in 1970-86.

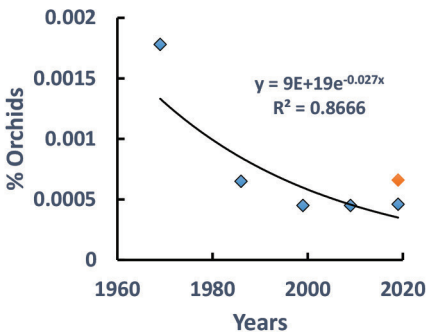


Figure 3: Relationship between numbers of tetrad records for *Himantoglossum hircinum*, expressed as a percentage of the total for all taxa, regressed against time using the last date of the five recording periods. An exponential regression has been fitted to the data. See Discussion for derivation of the red diamond point.

The graphs for all seven species classified as having a high rate of decline were mostly very similar. That for *Platanthera bifolia* (Lesser-butterfly Orchid) is given as an example (Fig. 4). Five species in this group declined greatly between 1969 and 1986, and continued to decline at a slower rate thereafter. However, the graphs for *Goodyera repens* (Creeping Lady’s-tresses) and *Herminium monorchis* (Musk Orchid) showed only a slight decline between 1969 and 1986, but a rapid decline thereafter.

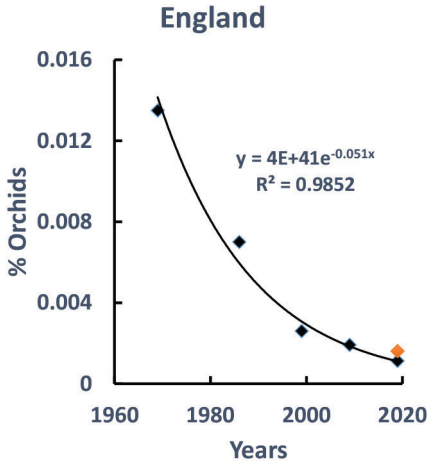


Figure 4: Relationship between numbers of tetrad records for *Platanthera bifolia*, expressed as a percentage of the total for all taxa, regressed against time using the last date of the five recording periods. An exponential regression has been fitted to the data. See Discussion for derivation of the red diamond point.

Discussion

Use of total records for all taxa as proxy for recording effort.

There is a problem at the very heart of this article. I have used the total numbers of records collected for all plant taxa as a proxy for the increases in recording effort, and I have then expressed orchid tetrad records as a percentage of those for all taxa. This approach is valid if increases in recording intensity similarly affect both the numbers of orchid tetrad records and the total number of records for all taxa. This appeared to be so in a previous article where I used the same approach to explore changes in orchid abundance in Scotland (Trudgill 2022a). With the Scottish data, between 1950-69 and 2010-19 the relationship between numbers of orchid tetrad records and total records for all taxa was linear. In contrast, with the data here, for England, regressing numbers of orchid tetrad records against the corresponding total numbers of records for all taxa produced a relationship that is best described by a logarithmic curve and was not linear (Fig. 5). There are several possible reasons for this difference between Scotland and England, but the consequence with the English data of using the numbers of records for all taxa as a proxy for recording intensity is that it is likely to result in rates of orchid decline being over-estimated.

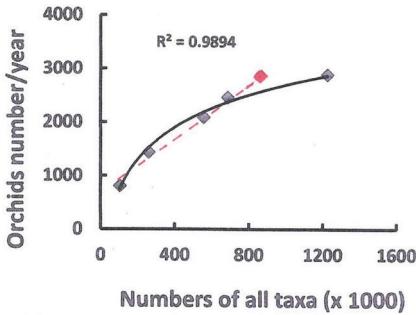


Figure 5. Mean total numbers of tetrad records collected for 34 taxa of orchids for five time periods in England regressed against the corresponding total records for all plant taxa. The black line is a logarithmic curve that has been fitted to all five data points. The red line is a linear regression fitted to the first four data points.

To explore the impact of this bias I made an assumption that the relationship between the numbers of tetrad records for orchids and that for total numbers of records for all taxa was linear between 1950-69 and 2000-09 (i.e. the first four data points – the red line Fig. 5). I then extrapolated this linear regression to calculate a new, ‘linear’ value (the red diamond, Fig 5) of 860,000 records for all taxa for 2010-19. The red diamonds in Figs. 1 to 4 are the % orchid values when this ‘linear’ value was used as the denominator.

When this linear value for 2010-19 was used to re-fit a negative exponential regression to the data for each species it consistently decreased the calculated value of the exponent for each species by between $-0.005\times$ and $-0.006\times$. Because this was an absolute rather than relative decrease for all species, it had a much larger impact on species with a small exponent (i.e. the four species with a low rate of decline in Table 2 – see Fig. 1) and its effect proportionally decreased as the size of the exponent (and the rate of decline) increased e.g. compare Figs. 1 and 4. The important conclusion from this exercise is that the greater the rate of decline between 1950-69 and 2010-19 the better the estimate of that decline.

Decline since 1950-69

It is not possible to quantify with certainty the decline of a particular species between 1950-69 and 2010-19 but, on a comparative basis, there are clearly major differences between species with some such as *O. apifera* and *D. praetermissa* having declined little, or not at all. The greater majority of species had, however clearly declined for most of the period between 1950-69 and 2010-19. The differences in the sizes of the exponents given in Table 2 do not readily translate into differences in percentage decline. To provide a guide, between 1950-69 and 2010-19 *Epipactis helleborine* (Broad-leaved Helleborine; exponent = $-0.024\times$, Table 2) had apparently declined by between c. 57% or 70% depending on whether or not the ‘linear’ estimate for the numbers of all taxa in 2010-19 was used as the denominator. Similarly, *E. purpurata* (exponent = $-0.037\times$, Fig. 2) had declined by between c. 78% and 85%, and *P. bifolia* (exponent = $-0.051\times$, Fig. 4) had declined by between c. 88% and 92%.

In Table 2 I have given the value of R^2 for each species. This provides a measure of how well the negative exponential regression fitted the data. An $R^2 > 0.95$ indicates an excellent fit and > 0.9 a good fit. For the 30 species classified as having intermediate and high rates of decline, the R^2 was 0.90 or greater for 24 species, indicating that the negative exponential regression provided a good fit to the data for the majority of species (Table 2). These high levels of correlation indicate that the regressions are meaningful and, when account is taken of the variations over 70 years in the people and methods involved in the data collection, are remarkable.

It is worth examining in more detail some of those species with a lower correlation between % orchid numbers and the passage of time (i.e. an $R^2 < 0.9$). The correlation was low for all of the four species classified as having low rates of decline (Table 2). This is because they are probably not declining and may have increased in the last decade. *Himantoglossum hiracium* (Lizard Orchid, $R^2 = 0.78$. See Fig. 3) can be added to this group because it appeared to decline little after 1950-69. For several other species the R^2 was low because the % orchid records increased, rather than decreased between 1950-69 and 1970-86. These included difficult to find species that, initially, may have been under-recorded e.g. *Corallorhiza trifida* (Coralroot Orchid, $R^2 = 0.74$), *H. paludosa* (Bog Orchid, $R^2 = 0.85$) and *Neottia cordata* (Lesser Twayblade, $R^2 = 0.84$) and, to a lesser extent, *Pseudorchis albida* (Small-white Orchid, $R^2 = 0.89$).

The data is not sufficiently reliable to determine with confidence the current rate of the decline of most species but some are almost certainly now increasing. Our warming climate is enabling a few species to expand their range northwards (e.g. *A. pyramidalis* and *O. apifera*) but most are not (Trudgill 2022c). Those most actively spreading northwards are 'winter-green' species so they might be expected to benefit from a warming climate. However, loss of suitable habitat seems to have been the main cause for the decline over recent years of many plant species (Stroh *et. al.*, 2019) and this will require planning and effort to reverse.

References

- Amphlett, A. (2015) Recording precision 1950 - 2014. *BSBI News* 129: 75-81.
- Stroh, P. & six others. (2019) *Grassland plants of British and Irish lowlands: ecology, threats and management*. Botanical Society of Britain & Ireland. Durham.
- Trudgill, D. (2022a) Orchids in Scotland: changes in occurrence since 1950. *British and Irish Botany* 4 (1): 34-41.
- Trudgill, D. (2022b) An exploration of orchid records in the BSBI database in four regions of the British Isles over five periods of time. *BSBI News* 149: 16-22.
- Trudgill, D. (2022c) Changing environment and orchid distributions close to their northern and southern limits in Britain. *British and Irish Botany* 4 (2): 125-139.

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