The Magic of Orchids

Mike Gasson

This is a web-adapted version of an original article commissioned by the Norfolk Wildlife Trust and published in the Eastern Daily Press on June 6th 2015 with the title "The Magic of Orchids: Inside Story of Norfolk's Mysterious Floral Wonders" .

Early-purple Orchid (*Orchis mascula*) with bluebells

One of the best times to enjoy our wild flora is from the end of April and through May. The woodland canopy has yet to close as tree leaves begin to open and the rapidly growing grass has yet to dominate the meadows. A large number of species take advantage of this brief, clear view of the sky to open flowers, attract pollinators and set seed so as to provide themselves with future generations. One of the most popular springtime spectacles is the carpet of bluebells in our remnant ancient woodlands, with sites like Norfolk Wildlife Trust's Foxley Wood never failing to attract large numbers of visitors. But look a little closer and you will be rewarded with a diversity of spring flowers, amongst which the Early-purple Orchids are jewels. They will thrive where a little extra light reaches the ground, especially along the edges of woodland rides. These orchids are experts at taking advantage of woodland management and, along with other plants and insects, they respond especially well to coppicing. After the coppice stools are harvested, extra light reaches the ground and flowering orchids can appear from nowhere, as if by magic, having hidden underground as tubers after the canopy closed up during the re-growth of trees in the coppice cycle.

Our preserved meadows respond in a similar way and early flowering is an effective strategy for herbs to beat the rapid advance of tall grasses. Although best known as an expert on woodlands, George Peterken expressed this beautifully in his recent book on meadows*: "Meadow flowers, like Cuckoos 'arrive' in April when they start growing, 'sing their song' in May as the flowers blossom, 'change their tune' in the middle of June as the grasses reach above them, and in July they 'fly away' as hay."

The classic early orchid of the hay meadow is the Green-winged Orchid, which can flower in such numbers as to paint the entire habitat purple. Those who know the right places will often make an annual pilgrimage just to witness this special spectacle. Whilst meadows are associated with hay as a critical part of traditional farming, fulfilling the need for winter fodder, there is a blurred distinction with pastures which tend to be associated with animal grazing rather than hay making. In Norfolk one of the best places to enjoy large numbers of Green-winged Orchids is the Norfolk Wildlife Trust reserve at New Buckenham Common. As its name suggests, this is a long established common land where traditionally villagers were able to graze their animals. It is the grazing of grass that maintains a habitat well suited to the orchids and this is a key aspect of ongoing management of this site. It works well with record numbers of orchids achieved in recent seasons.

Green-winged Orchid (*Anacamptis morio*)

Hoe Rough is another Norfolk Wildlife Trust reserve that supports the Green-winged Orchid but here the population has always been restricted to a small area of meadow grassland and plant numbers can be counted in hundreds rather than the tens of thousands found in the most prolific habitats elsewhere. Numbers here have been falling for several years and this poses a problem in defining the best management strategy. Although instances of flowers disappearing due to browsing by stock or wild herbivores have been observed in the past, it is clear that grazing is essential for the maintenance of a habitat suitable for these orchids. Setting up a small herbivore exclusion zone led to the rapid development of rank grass and the complete suppression of the orchids as flowering plants. Monitoring their growth through the year was more enlightening. After they have flowered and set seed the orchids disappear as 'above ground' entities, surviving high summer as underground tubers. In the autumn they reappear as small rosettes of leaves that hug the ground, thereby minimizing damage from grazing herbivores. Little loss of these reappearing plants occurred and most survived to flower again. Flowers were equally untouched by browsing, persisting to be pollinated by roving bumblebees and successfully set seed. After that there was a problem. The green seed pods seemed especially popular as lunch for the local rabbits and the entire population of fruiting orchids was wiped out. Hence, it may be that the loss of seed and consequent lack of new plant recruitment accounts for the ongoing decline in the Green-winged orchid population at Hoe Rough. Hopefully, some protection of the green seed pods will help to reverse this decline and allow numbers to rebuild over time.

Pink colour variant of Green-winged Orchid at Hoe Rough

One of the added attractions of both Green-winged Orchids and Early-purple Orchids is the occasional appearance of colour variants that can occur in different shades of pink or even as pure white 'albinos'. Although the Hoe Rough population of Green-winged orchids has always been relatively small, it used to reliably include examples of these pink and white variant colour forms. Sadly, this feature seems to have been lost as plant numbers declined.

Pink and white (albino) colour variant of Green-winged Orchid

It is interesting to speculate on the reason that colour morphs are maintained by these orchid species. One explanation relates to the devious way that these species deal with their insect pollinators. They are masters of the con, attracting bumblebees with the promise of a reward but in fact saving the energy needed for nectar production and offering absolutely nothing. Insect pollinators are held in the local habitat by companion flower species that do offer a nectar reward but the bees will soon learn that the purple orchids are not the best place to look. Having a few different coloured flowers is one way for the orchids to re-trick insects that have grown wise to the purple flower con!

Wild orchids are always rare and a joy to find but as well as their inherent beauty they are some of the most highly evolved plant species with intricate insect associations of various sorts. After these early species there are later ones to seek out and enjoy. The Spotted and Marsh orchids are also con artists but the Fragrant Orchids and Butterfly Orchids do offer a nectar reward in their long thin spurs. They are specially adapted to attract butterflies and moths that in return facilitate orchid pollination. Then there are the Helleborines that provide 'cups' of nectar that attract various insects, including particular species of wasp. An encounter with fermented nectar can prove incapacitating and it is amusing to observe a drunken wasp fall from a flower!

Probably the height of insect adaptation in orchids is achieved by members of the *Ophrys* genus that include our Bee Orchid. Most of these species have lips and scents that mimic particular female insects and attract males whose advances achieve fertilisation of the orchid flowers rather than the intended insect mate! A final twist is that our own Bee Orchid has dispensed with this particular pollination con and instead fertilises itself, needing only a gust of wind to do the job. This accounts for the persistence of curious Bee Orchid variants, several of which can be found here in East Anglia.

* 'Meadows' by George Peterken, published by British Wildlife Publishing, 2013

Norfolk Bee Orchid variant lacking anthocyanin pigment
Ophrys apifera var. *chlorantha*