Shade Monthly….Special Epimedium Edition

At the AGM this year the view was expressed that a printed newsletter circulated by post, and covering mainly administrative issues was a waste of money. Instead it was suggested that, once a year, Shade Monthly would produce a longer edition, and that, in addition to the usual electronic circulation to those members with an e-mail address, we would run off copies from a computer printer and post them to the relatively small number of members who are not on line. The money we saved on postage and printing could be diverted to seeking quality articles for the edition and/or more expensive speakers for the AGM.
This is the first of such editions, dedicated to those choice woodlanders, the Epimediums. We have four articles. The first, which gives an account of the cultivation of the genus and recommends some fine cultivars is by Roger Hammond the keeper of one of the Plant Heritage National Collections. The second is by Sally Gregson, author of 'The Plant Lover's Guide to Epimediums', on the use of Epimediums in the garden. The third by Julian Sutton, who has developed some both beautiful and vigorous new hybrids, is on the breeding of Epimedium varieties, and the final one by myself which is a summary of Stearn's account of the evolution of flower structure in the genus. I would like to thank all the authors for supplying such good articles gratis. I would also like to thank Sue Lander for her help in sourcing the articles.

(1) Epimediums Their Culture and Some Recommended Varieties

by Roger Hammond,
holder of the National Collection of Epimediums in Brentwood, Essex.

To see many more pictures of Epimediums, please visit www.themagnolias.co.uk and click on Epimedium Gallery.

Epimediums are perennial plants which prefer a moist but well drained soil in partial shade. On our London Clay soil we normally dig in some sharp sand along with plenty of organic matter. For this we use our own garden compost which consists of shredded, woody prunings and herbaceous material, plus grass mowings. It has generally been composting for up to a year before use, by which time it has reduced in volume considerably, but looks so good you almost wish you were a plant! We frequently also dig in some multi-purpose compost, in the belief that it may last longer in the soil than our composted material.

About twenty years ago the number of Epimediums available to gardeners started to increase from around ten. This was down to a few plant collectors finding a considerable number of new and very distinct species in China. These have gradually become available to gardeners, to the point that it is now possible with a computer and credit card to have around fifty delivered to your door. This is quite an expensive undertaking, but no doubt easier and cheaper than going to China and seeking them in the wild! In all honesty, I should admit that some of the fifty or so species are probably only of interest to botanic gardens, National Collection holders and serious enthusiasts, as they have insignificant Chickweed sized flowers. Epimedium enthusiasts, be they amateur or professional nurserymen around the world, have been busy breeding the new species together or with the previously available ones to produce a wealth of new and exciting garden plants. Epimedium are self sterile, so in a garden of mixed species and/or hybrids, the results of seed sowing are going to be new hybrids. Random cross-pollination by insects will no doubt produce some good garden plants. However a few serious plant breeders are doing controlled crosses, with specific aims in mind.

Epimediums are easily propagated by division, which can be carried out in early spring before the new shoots have developed, or in late summer. Potted specimens can be split using a pair of strong hand-forks, perhaps aided with an old knife or secateurs. In the garden two forks back-to-back are usually sufficient for a clump which has already been dug out of the ground.

I will attempt below to present to you a list of a few species and hybrids, some of which may be new to you, which I personally like and would recommend. I have chosen in the most part those which are available to buy from UK mail order companies, or direct from nurseries with a good shade plant section. I regret to say at present you are unlikely to find them at a normal garden centre.

Starting with the shortest and a deciduous species there is *E. brevicornu* and its form *rotundatum*. This is a plant for a raised bed, rock garden or edging of a woodland bed. When established it will carry clouds of half inch wide, white flowers, over fresh new leaves. *E. davidii* was one of the first of the newer Chinese introductions and we first came across it in the 1990s at the now closed, Washfield Nurseries. It is a species that is deservedly popular and fairly easy to find. It is a compact plant, which is ideally planted as a group next to the path in a woodland garden. The four yellow petals form a trumpet with four pointed spurs. This species varies somewhat between clones, some being considerably taller than others.

E. ecalceratum is thought to be a primitive species. In leaf it is similar to *E. davidii*, but carries small pendulous yellow flowers which are four sided bells, approaching box shaped. It is a plant for the edge of a woodland path or better still a shady raised bed, which will bring the dainty flowers nearer to eye level. There is an American selection or hybrid of *E. ecalceratum* called *E*. 'Lemon Zest'. It looks exactly like the species but is much more vigorous.

E. stellulatum is available to gardeners as around four different clones, the most commonly for sale being 'Wudang Star', a plant collected by Roy Lancaster in 1983. The various forms all produce very similar white star like flowers in profusion, held nicely clear of the foliage. The new foliage has pleasant reddish suffused patches. Other forms offered by nurseries are the straight species and varieties 'Yukiko' and 'Long Leafed Form'.

E. *dolichostemon* blooms with many pendulous white, *Dodecatheon*, 'shooting star' type of flowers. The evergreen foliage is glossy and free of spines around the edges.

E. fargesii is a somewhat similar species with flowers that have slightly narrower petals in white or in the variety 'Pink Constellation', a pale pink colour. This was the most admired plant on our show stand at Hyde Hall last spring. I think if we had some for sale they would have sold well. Both the species and its variety have pointed leaves with spiny margins but with the pink variety they are slightly narrower.


E. franchettii carries pendulous yellow flowers with four petals that taper into pointed spurs. This type of flower is common to a number of species and is often described as like four-legged yellow spiders. The pointed evergreen foliage is often a good pinkish red colour when freshly emerged. There is a variety of *E. fargesii*, named 'Brimstone Butterfly, which has rather larger leaves. When new in the spring they are of a most attractive, pinkie orange colour. Some authorities are now saying it may belong to another species. Whether or not this is so, it is one of our favourites.

E. myrianthum is more grown as a foliage plant than a flowering one, as individually, its white flowers are small, at about a quarter of an inch across. In a substantial plant producing several flowering stems the cloud effect of hundreds of small flowers is attractive rather than spectacular. However the young foliage colour could be described as spectacular. The new leaves are heavily speckled in dark red. There is a variety 'Mottled Madness' I would love to add to our collection.

E. 'Amber Queen' is a hybrid raised by Robin White of Blackthorn Nursery, which sadly no longer trades. For many *Epimedium* enthusiasts this nursery was the primary source of the newer Chinese species in the UK. 'Amber Queen' as the name would suggest has flowers of an orange hue, but it is the sheer number of flowers an established plant produces that makes it a plant to seek out. Keith Wiley of Wildside Plants has bred a somewhat similar plant *E*. 'Wildside Amber'.


Epimedium 'Pink Champagne'


Epimedium 'Domino'


Epimedium grandiflorum 'Buckland Spider'

E. 'Pink Champagne' is a fairly recently released hybrid which was bred in America by Darrell Probst. Darrell is a keen plant collector, who is responsible for collecting a number of new species of *Epimedium* from China and propagating them to the point that they could be bought by the gardening public. 'Pink Champagne' has spurred petals which are deep pink at the centre of the flower with lighter pink spurs. Another attractive feature of the plant is the strong maroon red speckling of the young foliage. This is a variety much admired by our visitors.

Again bred by Darrell Probst in the USA is *E*. 'Domino'. The flowers are rosy red towards the centre of the flower but extend into translucent white spurs. It is an incredibly prolific flowerer and this is why it is recommended. 'Domino' is not amongst the most freely available yet, but I think it will be in a year or two. It is a strong growing plant, making a tight clump over 18 inches tall, with the flowers held nicely above the foliage.

E. grandiflorum is a Japanese species which has been known to UK gardeners for more than a century and a half. It is more or less deciduous and the flowers are generally of a good size. The colour varies considerably within wild populations, but now with keen amateur and professional breeders crossing and selecting in many countries, the colour palette varies from white, through various pink and lilac shades, through reds to violet and purple. Some varieties have two colours with for example, pink sepals and white petals. There are yellow flowered forms, some of which are said to be a separate species, *E. koreanum*.

There are now hundreds of named forms and it will be impossible with a National Collection in an average garden to collect them all. Our intention is to collect a representative number of distinct and garden worthy varieties. One bred by Keith Wiley, 'Buckland Spider', has become popular for good reasons, as it is vigorous and floriferous. Our favourite plant of all of our 2014 new plants to flower was *Epimedium grandiflorum*

'Akagiza Kura'. We can't say as yet how good it will be for us as a garden plant, but we love the flower colours.

(2) EPIMEDIUMS IN THE GARDEN

by Sally Gregson

For over a century and a half gardeners have been planting epimediums to fill those awkward spaces in dry shade, grateful for their acquiescence, if not enthusiasm, in such inhospitable conditions. They have romped away, their bronze leaves glowing in winter, their dainty yellow flowers lighting the bosky shade. If we remembered, we sheared them over in February, the better to watch the little buds unfurling and opening in April, and mostly left them to their own devices. But some of these warrant a second look. The combination of flowers and young foliage is quite delightful.

After the flowers have faded the leaves retain their good looks well into the summer, contrasting their foliage with hostas, *Geranium macrohhizum*, bluebells, and the more vigorous variegated plants such as *Arum italicum* 'Pictum'. In dry shade they would grow beneath mahonias and Christmas Box *(Sarcococca spp.)*, gradually filling up the blanks and suppressing the inevitable weeds. They look well beneath Japanese acers and later flowering *Hydrangea serrata*, but in this company they have designs on world domination. It pays to keep a close eye on their colonising ways. In better soil don't let them get too close and personal up against your precious acers and hydrangeas.

E. x versicolor beneath a Japanese Acer,
with Aconitum foliage and Disporum sessile 'Variegatum'

There are less bossy species for dry shade too that have been around for many years, such as *E. x rubrum* and *E. x warleyensis*, which will rub shoulders with hellebores, *Tiarella*, and *Brunnera*

companionably, and only need a modicum of control in winter. Bowles Golden Grass (*Milium effusum* 'Aureum') could seed through the clumps, or the Welsh Poppy *(Papaver cambricum)* whose orange and yellow flowers would echo those of *E. x warleyensis*. And there's another, fairly new cultivar, slightly less tolerant of dry shade, that is not just happy, but makes a brilliant show of it on a bright winter's day. *E.* 'Black Sea' is a scarlet knock-out planted beneath some red-stemmed *Cornus alba* 'Sibirica'. In my own garden I have placed this combination close to a weeping Silver Birch and popped in a few snowdrops for good measure. In some gardens in an especially bright, cold winter the leaves are said to turn the eponymous black. In spring it bears delicate light orange and sulphur flowers, and then simply, but gently, covers the ground throughout the summer.

E.BlackSea – growing beneath Cornus alba 'Sieboldii', and snowdrops in front of weeping silver birch

Epimedium grandiflorum and its Japanese cousins were sent to Europe from Japan about 150 years ago by the physician to the Dutch East India Company, Philipp von Siebold. These were taken on by Ghent University who remain the point of reference for the type plants of all the species. These new epimediums quickly caught the imagination of 19th century gardeners and made themselves at home in acid soils beneath the fashionable rhododendrons and azaleas of the grand gardens of the period.

In such conditions *E. grandiflorum, E. x youngianum,* and *E. sempervirens* thrive and make small humps of deciduous foliage beneath magnolias, Japanese acers, and low-growing *Hydrangea serrata.* The small rounded hilltops of *Rhododendron yakushimanum,* more at home in today's less extensive gardens, would make a good 'landscape' to populate with tumps of *E. grandiflorum* and some of the delightful *Erythronium* species. If you dare, and have a few to spare, you could also plant a few *Hepatica nobilis* to add to the jewel-box. The elegant dark leaves of the rhodo would present a good foil for a collection of horticultural treasures. Of the many epimedium varieties now available that are acid-loving, I find *E. grandiflorum* 'Queen Esta'(right) reliably produces clouds of large, lavender-pink petals, each terminating in a white full-stop, beneath carmine sepals held up above the petals. It's a well-tempered plant even when it's contained by a pot of acid compost, as it is here at Henley Mill in a shady corner. It takes pride of place next to the remarkable *E. grandiflorum* 'Purple Prince' whose flowers are the richest royal

purple imaginable, and *E. x youngianum* 'Merlin' with its crowded, little carmine caps.
And then suddenly, within the last twenty years we gardeners in Europe, the US, and Australia have been treated to an influx of startling new species and their hybrids. Modern-day plant hunters such as Mikinori Ogisu, and in the US, Darrell Probst, have brought back a wealth of new species from the remote valleys of Sichuan and Yunnan in China, areas hitherto unexplored by Western botanists. Glorious newcomers such as *E. brachyrrhizum* with its big pink flowers, the translucent white and cream *E. latisepalum,* and *E. ogisui (below)* named for a truly great, modern-day plant hunter. It's among the first to flower with pure white flowers above red-splashed young leaves. The wide, pure white sepals almost cover the spurred petals entirely. It looks very effective in the garden grown beneath a collection of white-barked *Betula utilis* var. *jacquemontii* amidst blue scillas and the soft azure wood anemones, *Anemone nemerosa* 'Royal Blue'. And it too is perfectly happy grown in a pot near the house where its early flowers can be appreciated better.

These new Chinese epimediums are quite different from the familiar movers and spreaders we are used to growing. They prefer a good soil: moist but draining, to quote the nursery catalogues. This sounds difficult but any soil in shade with the improvement of plenty of organic matter should work well. Think hellebores, ferns and pulmonarias, which would also work well as companions. Chinese epimediums are 'evergreen' and steadily establish themselves. Their over-wintered leaves just need tidying up in spring, leaving a few to protect the buds from late spring frosts. In my own garden I grow *E. brachyrrhizum* alongside the glorious *Pulmonaria* 'Blue Ensign', and some of my very special hybrid hellebores. When the latter flower at the end of winter, the previous year's epimedium foliage still looks good. From a distance. And by the time the hellebores have become a little green, the epimedium comes into its own, throwing up its sugar pink flowers. The long, rose pink sepals curl down around deeper pink petals. And in the American selection, *E. brachyrrhizum* 'Karen' the contrast of colours is greater and the leaves are a lighter shade of salmon-red.

Epimedium brachyrrhizum with pulmonarias

In the UK Mikinori Ogisu passed these new species on to his plant-hunting colleague, Roy Lancaster, who in turn handed them to specialist nurseries to ‘play with'. It soon emerged that because epimediums are self-sterile all their seedlings were hybrids between sometimes quite unlikely neighbours in the nurseries, and in gardens. Selections were made. Plants were named. And these hybrids, big, bold, beautiful, have become the divas of the epimedium world.

One of the first nurserymen to receive the newly arrived species from Roy Lancaster was Robin White of the late Blackthorn Nursery. He deliberately hybridised and selected out some beautiful seedlings that have persisted in nursery lists for over ten years. Glorious hybrids such as *E.* 'Amber Queen' and *E.* 'Flowers of Sulphur' which have won over many at specialist nurseries and plant sales up and down the UK. Although less widely available than some of his other named seedlings, *E.* 'William Stearn' must have a mention. Prof. Stearn was of course the epimedium expert par excellence. His work on the genus is unparalleled. And the hybrid that bears his name is a glorious deep ruby red. The flowers have large pink sepals with white tips that seem to shelter the raspberry red petals within. The effect against the red mottled young foliage is dramatic. It looks well against a pale background such as dwarf variegated hostas, or the re-emerging leaves of *Miscanthus* 'Morning Light'. And it associates with other epimediums with variously coloured paler flowers.

When Blackthorn Nursery closed, Robin White gave many of his epimediums to Karan and Nick Junker who have planted them out in their extensive new nursery near Milverton in Somerset. These have provided the blood for some lovely new crosses made by their son, Torsten. He has produced some interesting new plants where the flowers are weather resistant, held above the leaves, the colour contrast is good, and the foliage sets off the flowers well. Torsten realises that the new varieties are becoming increasingly similar. So he chooses to name only those that are distinctly different, or an improvement on the type. So far he has selected three: *E.* 'Autumn Raspberry', *E.* 'Lemon Meringue Pie', and *E.* 'Heavenly Purple'. This last is a winning play on words. It's a selection from *E.* 'Pink Constellation’ (Left). Its clean pale pink sepals are held horizontally above deep, dark purple petals that frame out the prominent green anthers and stamens that point down like a ballerina 'en pointe'. It is exceptionally beautiful.

And the work goes on both in Europe, the US, and in Australia. In northern France the legendary Thierry Delabroye has turned his attention from hellebores and heucheras to new and exceptional epimediums. Hellebores and heucheras do make good companions to these rising stars. They all need the same rich shady conditions, alkaline or acid soil, and their own space in the border. These hybrids are a far cry from the little despots we know so well. One of his favourites is a delicious peachy pink *E.* 'Ambrosine' which he has named for his daughter. With its subtle pink-veined new leaves that echo the big two-tone flowers, it must be the finest epimedium he has bred to date. What a compliment to his beautiful daughter!

They will shortly be coming to a nursery near you.

Sally Gregson, 2016

All images are taken from Sally's book, 'The Plant Lover's Guide to Epimediums' is published by Timber Press @ £17.99. Signed copies are available post-free from www.millcottageplants.co.uk.

Recommended nurseries:
Cotswold Garden Flowers (www.cgf.net)
Desirable Plants (www.desirableplants.com)
Edrom Nurseries (www.edrom-nurseries.co.uk)
Junker's Nursery (www.junker.co.uk)
Long Acre Plants (www.plantsforshade.co.uk)
Mill Cottage Plants (www.millcottageplants.co.uk)
Koen van Poucke (www.koenvanpoucke.be)

(3) Breeding Epimediums
by Julian Sutton

Motivation

Sarah and I have dabbled in epimedium breeding for 12 years or so. It's interesting, it's a bit of fun and most of all there's the possibility of ending up with a few really novel, good garden plants which will give you, your friends and maybe even some strangers pleasure. If like us you propagate plants and, as someone nicely put it 'swap them for money' there may even be some minor financial reward. I've written what follows for people who share our motivations. If you're into intellectual property, Plant Breeders' Rights, creating the next big-business garden centre wonder, then you've no business listening to me. And if you quite fancy that sort of nonsense, forget it - if you were serious you'd be onto it already

Breeding Aims

Even as a dabbler, it's worth having a plan. The idea that if you choose two really nice parent species, their hybrid seedlings are bound to be good, is naive. Consider carefully what the existing species and hybrids do, what their strengths and weaknesses are. Think about individual characteristics, matters of size, shape, colour, number, timing, but also growth requirements. Be specific - when you say 'big flowers' do you actually mean 'broad inner sepals'? In doing this you will properly get to know the existing plants, and may well end up learning things you didn't know that you didn't know, always a great joy to the intellectually curious.

Once you've grasped what's there you can start to spot gaps, plants with desirable character combinations which could exist but don't. Select a couple of breeding aims, ideally ones which you don't think anyone else is working on - there are so many things to try, so few of us to try them. Lay siege to your aims. It could be a long campaign, so keep the desired outcome clear in your mind.

By way of example, one of our breeding aims has been to combine the tolerance of summer drought which contributes so much to the cheerfully bomb-proof character of the tough old garden varieties, with larger, longer-spurred flowers in longer, perhaps branched inflorescences, held above rather than below the old leaves - and perhaps in colours other than yellow. All this can be summarized as 'showy but tough'. We ended up crossing some rather distantly related plants,

particularly the Turkish *Epimedium pinnatum* ssp. *colchicum* with Chinese members of Section Diphyllon.

Our cultivars ‘Totnes Turbo’ and ‘Winter’s End’ meet most of these criteria to our satisfaction. Comments like ‘the new ‘Sulphureum’’ and ‘the new x *perralchicum*’ are music to our ears - but both are yellow flowered.

E. latisepalum

E. pinnatum ssp. colchicum

E.Totness Turbo’

Barriers

Wild species remain distinct because there are barriers to gene flow between them. It’s obvious; it must be so. The important questions are ‘what are these barriers?’ and ‘how can the breeder overcome them?’

Experimentation and garden experience teach us that there are very few genetic barriers to breeding within the genus. In my experience, even the most distantly related species are capable of producing hybrid offspring, although in some cases the hybrid may have reduced fertility (I’m tempted to use the word ‘sterile’ but this implies something absolute - the evidence for that is absent and it might unnecessarily discourage the breeder who might otherwise try to utilise low levels of pollen fertility, always a good strategy.)

Most or all epimediums are probably pollinated by bees in the wild, admittedly of different sorts. What seems to keep the species apart is geographical and ecological isolation. Finding more than one *Epimedium* species in one place seems to be the exception rather than the rule.

Within species, there is one important barrier to breeding. The whole genus shows strong self-incompatibility. One individual, if self-pollinated, will not produce seed.

Let's combine all these observations and apply them to the garden. We bring together examples of many species, all pollinated by bees, in a country where short-tongued generalist bees are abundant. We probably introduce a single genetic individual of each species - there may only be a single individual, repeatedly propagated by division, in cultivation. We add some natural and artificial hybrids, many of which are fertile, to the mix. Each individual is strongly self incompatible. The result of all this - plenty of seed, and all of it hybrid.

The garden environment, then, seems almost designed to break down the barriers between *Epimedium* species. Leave it to the bees, though, and only a tiny and often rather boring fraction of the possible hybrids will be achieved. For in their foraging patterns the bees are working to their own ends, which don't coincide with our own. The challenge for the breeder is to control the process of garden hybridization.

Controlled Crosses

I have always found it easiest to work with potted specimens, and modestly sized ones at that. Divisions made after flowering in June, kept watered in 1 litre pots through the summer and brought under cover for the winter are manageable. They will not have too many inflorescences, which makes it easier to identify the flowers you've interfered with. They are small enough to shift around and cover if necessary, and are easily carried into the kitchen so you can sit at the table under a good light while doing your stuff.

Easy access to the flowers is helpful, so I suggest removing all the old growth, at ground level, before the new growth starts to appear. Watch the plants daily. Know the state of each mother plant, in particular.

Epimedium flowers are protandrous, that is the stamens release pollen before the stigma is fertile, or even exposed. I try to pollinate each flower on the first day the stigma is visible, and to repeat it a couple of times over the next few days.

I use a black Bic biro lid for pollination, not my trick but Brian Mathew's. The prongy bit that's supposed to clip over your pocket slips very precisely into all sorts of flowers. Rubbing it on your shirt gives it an electrostatic charge, so the pollen sticks beautifully - I find the concave surface best - until you wipe it neatly across the stigma of the mother flower. It's easily cleaned afterwards, and being black even tiny amounts of pollen show up well.

If it matters to you, bees could be excluded from an area of the greenhouse / polytunnel using horticultural fleece draped over a frame of canes, or any other Heath Robinson arrangement which springs to mind. However, you may be happy to live with the risk that some flowers may be pollinated by the wrong father as well as by the one you chose.

Record keeping is important, but it has to begin before the first flower is pollinated. Even knowing which flower has been pollinated matters when it comes to collecting seed, especially if you've tried several fathers on the same mother. I start by identifying each inflorescence as it emerges by placing a ring of uniquely coloured wire loosely around it at soil level. Coloured wool or embroidery silk has a nasty habit of ending up grey by the time the seed is ripe. I then draw a map of the inflorescence, each branch and bud in its correct position (this is an ongoing process, since the apex won't properly have expanded when the first flower is ready to handle) and number each bud. A list of bud numbers is then ready for records. You'll then know that bud 7 was pollinated using a particular father 2 days ago, so it's time to repeat it, and when the seeds are ripe there will be no question of 'who's the daddy?'

Seeds take some weeks to ripen. You may get bored, but don't forget to watch and water the mother plants. The pods release their seeds explosively, and when that happens the ants will haul them away. Somehow you've got to learn to get them just as the valves of the seed capsule begin to separate. Sow the seeds immediately. I mean it! Have a pot of compost ready, labelled with the cross number, parentage or whatever you do, and put them straight on. Cover with a bit of grit and water up. If there are more pods of the same parentage still to come, don't wait. You can sow the first ones one one side of the pot, covering these but leaving the rest of the compost uncovered for the next lot. Leave the seed pans outside, watered. Don't be tempted to cover them in winter. Exposure to cold stimulates germination, which may eventually happen in March to May, a year after pollination.

If grown on well, seedlings typically flower first after two years, sometimes one or three. We haven't yet had a seedling which had not flowered after three years but which went on to become a worthwhile plant.

Selection

It will take several years before you know that a new plant shows real promise. The first flowering is normally feeble, but by the second we can normally exclude a lot of plants which don't cut the mustard. Look for plants which meet, or are heading for, the criteria you chose, but be aware that to be worth room in somebody else's garden they have to be good on all fronts. And keep half an eye open for something unexpected but interesting. There will be a lot of trialling to be done, and many promising plants will eventually hit the compost heap.

Remember the stuff that annoyed you about other breeders' work. There's the tendency to name and release something good, followed by a series of others that do the same thing a little better. Should they have waited? But would they have died before they reached the one, ultimate variety? And there's the tendency to become a specialist in your 'own' genus, or species, magnifying in your mind the differences and using what looks to outsiders like exaggerated language as you try to describe them - think of the scorn heaped by the sane on 'blue' roses. *Nerine* 'Susan Norris' was heralded by its breeder, about 50 years ago, as 'the first hardy orange'. It's a nice plant but is neither properly hardy nor properly orange.

The antidote, I'm sure, both to hubris and to excessive modesty is to show people your plants; show them to specialists, yes, but also to general-purpose 'good' gardeners whom you trust to ask for bits of what's really worthwhile and to ignore the run-of-the-mill.

From Serendipity to Strategy

Early efforts in breeding a particular group are inevitably hit-and-miss. There will be more failure than anything else. 'There's no success like failure,' whines Bob Dylan, 'and failure's no success at all.' Listen to the man. Good early results will be as much down to luck as anything else. Learn from that too. Those who become successful breeders, and I'm looking at other people rather than ourselves, develop a sense of what might work and what might not, a body of knowledge which guides their work and makes success more likely. Some of this comes from listening to what other, more experienced people have to say. Take them seriously, but don't assume they're right. I'm not advocating a paranoid, Mulderish 'trust no one', rather a critical Oxonian 'question everything'. In the end, learn from experience. An understanding of genetics may be useful in the background, but you'll never know for sure the genetic basis of any of the characters you're interested in. Earthy, practical experience is the thing. Seamus Heaney put it nicely, although he was

talking about the dubiously intertwined fields of creative writing and being a Viking - ‘trust what nubbed treasure your hands have known.’

Julian Sutton

(4) Flower Structure and the Evolution of Epimediums
by Joe Sime

As well as the superb foliage of many species, it is the complex and differing flowers that make epimediums such choice plants. The purpose of this article is to enable you to get even more pleasure from them by understanding these structures and how they have evolved. It is based very heavily on the account given by W.T.Stearn in his monograph of the species (ISBN 1 84246 039 0). I have merely translated it from the original botanical language and added photographs captured from the website
http://www.epimedium-collection.com/home.html

All epimediums have the same basic flower structure, with 3 ‘whorls’, each consisting of 4 segments. The outer whorl is called the outer sepals, the next the inner sepals, and the innermost, the petals.
The most primitive species in the genus is E. campanulatum. It has simple, cup shaped flowers. The outer sepals soon fall as the flower opens. The inner sepals are yellow or reddish and much smaller than the yellow petals.

E. campanulatum

E. ecalcaratum

The next development is to be seen in the species E. ecalcaratum. It is very similar to campanulatum, with the exception of the growth of a small sack at the base of the petals which has cells that produce nectar. In some forms of the species this is slightly more pronounced.
The next stage of evolution is represented by E. davidii in which this small sac expands outward into a definite spur. The outer sepals are small and blunt, the inner sepals narrow and reddish and the petals have a fairly large ‘skirt’ and a spur. This basic form leads to

some of the most impressive Epimedium flowers as the inner sepals get longer and may have a different colour from the petals. E. epsteinii is a good example. However in all of this group the inner sepals remain shorter than the petals which have a definite ‘skirt’.

Epimedium davidii

Epimedium epsteinii

In the next stage the ‘skirt’ shrinks to a simple rim to the elongated spur. The spur is still longer than the inner sepals. In its simplest form this is shown by E. elongatum. In this flower the outer and inner sepals are both relatively small, the latter being purple in colour. The flower is dominated by the yellow spurs in which there is no ‘skirt’. Other species with this structure have much more conspicuous inner sepals. E. acuminatum is a good example. There are several forms/varieties of this species with different colour combinations. One of the most striking is ‘Night Mistress’.

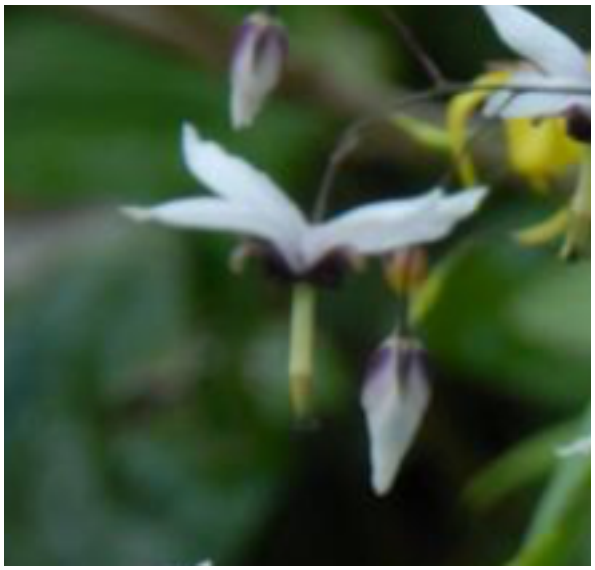
Epimedium elongatum

Epimedium acuminatum ‘Night Mistress’

The process continues with the shrinking of the spur to a slipper shape, with the inner sepals now bigger than the spur. There is also a general trend to smaller flowers and many more on the inflorescence. This is demonstrated by E. alpinum. Here the outer

sepals are reddish-grey and small. The inner sepals are red and the slipper shaped petals are yellow. In some species in this group the sepals and petals are reflexed and the stamens stick out. E. fargesii is a good example of this structure. The outer sepals are small and violet, the inner sepals are white, narrow and tapered and strongly reflexed. The slipper shaped petal is dark purple and much shorter than the inner sepal.

Epimedium alpinum



Epimedium fargesii

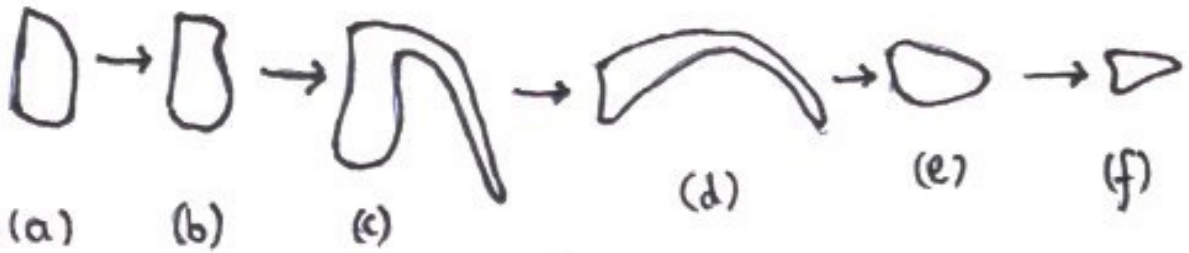
The process of shrinking the petal continues until it becomes a minute pouch, more like a nectary. Stearn distinguished two stages in this process, but to the gardener the differences between the two are hard to see. This stage is best seen in Epimedium perralderinum. The outer sepals are brown, the inner sepals oval and bright yellow and the petal is reduced to a very small, brownish purple pouch.

There are now many hybrid epimediums, some of which show flower structures which are combinations of those of their parents. E. x versicolor is a cross between E. grandiflorum which has long spurs and petals with a ‘skirt’ and E. pinnatum subsp. colchicum which has a structure similar to perralderinum. The flower has petals with a skirt and spur, but large rounded inner sepals like pinnatum.

Epimedium perralderinum

Epimedium x versicolor ‘Cherry Tart’

To recap, I have tried to sum up this series of changes in a diagram shown below. I apologise for my lousy artistic skills.



(a) represents the simple petal of E. campanulatum
(b) shows the small sac of nectar producing cells of E. ecalcaratum
(c) the small sac has expanded into a spur as in E. davidii
(d) the base of the petal (the skirt) is much shortened just leaving the spur as in E. elongatum
(e) the spur shrinks to a small slipper shape, now much smaller than the inner sepals as in E. alpinum
(f) finally the 'slipper' is reduced to a small pouch as in E. peralderinum

The remaining question is 'What selective forces have driven this evolutionary process?' Stearn is silent on the subject. One can speculate on the co-evolution of pollinators with complex nectar sources designed to meet their specific mouth parts, but there is no direct evidence of this in the evolutionary record. There are some studies of the foraging habits of bees with different proboscis lengths in Japan. As expected those with short tongues take nectar from short spurred epimediums, those with long tongues take nectar from both long and short spurred forms.
It remains a mystery. All we can do is enjoy the flowers.

(5) Available Seed

If you are a paid up member of the Shade and Woodland Plants Group and would like some of the seed offered below, please send a SAE to S.J.Sime, Park Cottage, Penley, Wrexham LL13 0LS.
If you have seed to donate, please send it to the same address.

Paeonia wittmanniana
Abies koreana
Anemonopsis macrophylla double flowered (from plant shown in Oct Edition)
Kirengeshoma palmata

Arisaema ciliatum
Kirengeshoma palmata ex Koreana Group
Arisaema consanguineum
Clerodendrum trichotonum