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Lessons from India

Richard Holman

Fig. 1 The collection of wild orchids threatens the 850 species in this area. Here, *Pleione praecox* is traded at Sohra market.

I am a professional gardener, currently working at Trelissick, a National Trust property in Cornwall. I have a particular interest in growing and conserving species from the Sino-Himalayan region, including *Rhododendron*, *Lilium*, *Nomocharis*, *Colocasia* and *Arisaema*. I am also interested in growing half-hardy orchids such as *Cymbidium* and *Pleione*, and enjoy the challenge of trying to grow rare and unusual plants outdoors in the generally mild climate of the south coast of Cornwall.

Many plants we might consider to be typically Sino-Himalayan are found in north-east India (which is not strictly part of the Himalaya), particularly at high altitudes. In November 2017 I was fortunate enough to participate in an expedition to explore

the flora of this area. We travelled through Meghalaya, Assam, Nagaland and Manipur by road, with excursions en route to explore the local plant life. While this region is almost in the tropics and the climate at low altitudes is certainly tropical, we were more interested in the flora at 2000m and higher, where the climate is verging on temperate in this part of the world and many of the plants should be hardy in the UK.

My intention was to document and photograph these plants and, by observing how they grow in the wild, learn as much as possible about the conditions they require, so I could apply this knowledge to cultivating them in Britain. I hope readers might also find this useful. I also wanted to assess any threats to the

flora as a result of the rapid development in this part of India, particularly road-building.

Some research before the trip (including Kingdon-Ward's *Plant Hunter in Manipur*) revealed that one of the most salient facts about the region is its extremely high rainfall – possibly the highest of anywhere on earth. Indeed, Cherrapunji in Meghalaya (known locally as Sohra) (fig. 2) holds the record for the highest annual rainfall ever: over 26m in 1861. The average is more like 12m per year, which is still 10 times the average rainfall for Cornwall!

We chose to visit in the dry season because, apart from our own comfort, it is a lot easier to travel. While I had expected relatively little rain, what I had not anticipated was just how dry and parched the land would be.



Fig. 2 Meghalaya, one of the wettest places on earth.

I was struck by the brown grass, dry soil and an absence of standing water. Considering that when we arrived in November 2017 one of the heaviest monsoons in living memory had finished only three weeks earlier, I was astonished not to see lakes,

puddles and swamps. Although the forests were still green and lush, as we walked through them it was very noticeable that the abundant epiphytes growing on the trees were brown and drying out. Several waterfalls were in full flow and I think this gives a clue



Fig. 3 *Arisaema* in the garden.



Fig. 4 *Colocasia esculenta* 'Pink China'.

as to what happens to all that rain. The underlying rock is porous limestone, so I would guess that the rain quickly drains into the bedrock and thence into the rivers.

The heavy rainfall is usually concentrated in the period May to September, while November to February is fairly dry. When we were there it was mostly dry and sunny with temperatures in the mid-20s, only slightly cooler and wetter at higher altitudes. The strong contrast between wet and dry seasons has important implications for cultivation in the UK.

Arisaema and *Colocasia* are tuberous aroids native to this part of India, with *Colocasia* commonly grown as a food crop. I grow both in the nursery at Trelissick, and I am attempting to introduce them into the garden. They tend to rot if left in pots when dormant in the winter, so I have learnt the hard way that they must be lifted and stored dry. One must also be cautious about watering them when they break dormancy, giving little and often until they are in full growth, when they enjoy generous water and feeding. This makes complete sense now I know about the sharp contrast between the monsoon wet season (our summer) and the dry season (our winter), which I try to replicate in the nursery.

Although it is not so easy to control conditions in the garden, I would urge anyone

who is interested to try growing these two genera. The key to avoiding rot during our wet winters is, of course, providing really good drainage.

I have succeeded in growing several species of *Arisaema* in the garden (fig. 3) for three years now, with hardly any losses. All the commonly available species should be cold-hardy (they came through sub-zero temperatures last winter), but they need a deep, leafy soil which gives good drainage. Mulching every year with a thick layer (20cm plus) of autumn leaves seems to work well to keep them frost-free and not too wet in our winter (the monsoonal dry season). They also prefer part to full shade (under deciduous trees or among shrubs). If you can arrange these two things they should provide you with interesting flowers and lush, tropical foliage almost anywhere in the UK. The wet part of the monsoon cycle applies as well, of course, and they'd appreciate a good drink in the summer – especially one like the summer we've just had!

Colocasia are not so cold-hardy, but there are species which can be successfully established in milder areas: try *C. gaoligongensis*, *C. esculenta* and *C. e.* 'Pink China' (fig. 4). They prefer more sun and warmth than *Arisaema*, and a very rich soil – but the same care ensuring wet and dry conditions

applies, perhaps even more so. I grow them in a mixture of our own compost and bark chips, with a drip hose running through it. The hose irrigates them all summer when they are in growth, though I have seen them grown beside a pond as marginals – they love water! As soon as they start to die back in autumn, I switch off the hose and follow with a thick mulch of compost (30cm plus) as they tend to be nearer the surface than the tubers of *Arisaema*, so need protection from frost. The bark chips should provide enough drainage to keep them from rotting in the winter, and even if the main tubers rot they will regenerate from the stolons which are freely produced.

There are around 850 species of orchids native to north-east India, and while most are not hardy in the UK, certain *Cymbidium* (fig. 5) and *Pleione* (figs 1 & 6) could be considered half-hardy since they can survive outside as long as they're kept frost-free in the winter. We saw several species growing wild, or sometimes epiphytes which had fallen from the forest canopy, however the best place to see them was at the botanic gardens we visited. This is partly because wild orchids are being over-collected by local people, making many species rare in the wild.

To some extent, the monsoonal cycle also applies to growing *Pleione*



Fig. 5 *Cymbidium elegans*.



Fig. 6 *Pleione maculata*.

and *Cymbidium*. I tend to lift *Pleione* when they are dormant in winter and keep them somewhere dry, dark and cool in paper bags, and then water them frequently when they're in growth. I just ease off watering *Cymbidium* in winter and keep them in a frost-free greenhouse, then put them outside and water freely when they start growing again.



Fig. 7 Mount Japfu, more accessible with a forest road.

I learnt a few other tips for cultivating orchids from speaking to those growing them at the botanic gardens:

For pleiones the best medium to use is leafmould with some bark chips added, growing them in terracotta pots. Water them really well when they are rooted and growing (ideally from the base), but when the leaves start to die back stop watering altogether and allow them to dry out naturally.

Cymbidiums, it seems, naturally grow as either epiphytes or terrestrial orchids. I saw that the same species, *Cymbidium elegans*, appeared to be equally happy growing in a tree or in the ground or in a pot with soil as the medium. When I have used simply compost as the medium for growing them in pots, I have

found that Cymbidiums suffer from excessive wet. Therefore, as a result of my observations in India, I have changed the growing media to a mixture between 'epiphytic' and 'growing in soil'. I mix 3 parts small/medium bark, 2 parts sphagnum moss and 1 part John Innes No. 3 loam-based compost, and use terracotta pots rather than plastic to prevent them staying too wet.

Most of the wild species of orchids need very little feeding; the growers give a very weak liquid feed of a balanced NPK fertiliser, and only occasionally, or not at all for very sensitive species. This makes sense as one would imagine that an epiphytic orchid growing in a crevice in a treetop would receive very few nutrients there – just occasional

rotting leaves. I have altered my feeding regime for orchids accordingly, and now I give only a balanced NPK liquid feed at one-quarter the recommended dilution once a month when the orchids are in active growth – and none at all when they slow down in winter.

One of the most interesting and botanically-diverse areas we visited was Mount Japfu, the second highest peak in Nagaland and the site from which Kingdon-Ward collected the first introductions of *Rhododendron macabe anum* among other species. It was impressive to see large specimens of this beautiful, big-leaved rhododendron still thriving there, and some were recovering well after being damaged in a forest fire a few years earlier.

A potential concern for the flora of Mount Japfu (fig. 7) was that a rough forest road leading up towards the peak had been cleared four years earlier. This might have made it easier for the forest to be exploited for firewood, hunting and orchid collection, and the improved access could have made further forest fires more likely. However we saw no evidence of this on our visit, and the forest road appeared not to be regularly used by vehicles. In fact I was pleased to see that the road was being reclaimed by the forest and its free-draining gravel surface formed a perfect

seed-bed for rhododendron seedlings, which we saw in profusion!

Although the rhododendron seedlings might have benefited from the lack of competition for light on the bare gravel track, I noticed that the areas where they were really flourishing and growing into strong young trees were where they enjoyed a thick layer of leaf litter round their base. I guess this leaf mulch provided nutrients, good drainage and a cool, water-retentive blanket round their roots. Rhododendrons have shallow roots and like them to be kept moist, but they don't like to sit in soggy soil or have the base of their trunks wet. For this reason they don't like to be kept in plastic pots, especially when they get a bit bigger. I have struggled to grow them on past a certain size in the nursery for this reason. After observing how they grow happily in nature, I've now decided to plant them out in an open bed with shade netting and a very free-draining soil. To further emulate their natural growing conditions, I cover the soil with a thick leafy mulch and top-dress with a slow-release fertiliser. This year, because our tree ferns at Trelissick were scorched in the cold winter, I used a mulch of their shredded fronds (fig. 8). This has worked really well, retaining some moisture even in the extremely hot weather, and



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Fig. 8 A thick tree-fern mulch cossets young rhododendrons back in Cornwall.



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Fig. 9 Dzukou Valley, 'the Valley of the Flowers'.

the rhododendrons have looked the best ever. I am sure any mulch of fallen leaves would do just as well as long as it's thick enough, and such a mulch would equally benefit other woodland plants in the nursery or the garden.

One other place I should mention is the Dzukou Valley (fig. 9), also in

Nagaland. This beautiful and eerie landscape is sometimes called 'the Valley of the Flowers'. In May and June it is festooned with wild flowers, including the Dzukou lily (*Lilium chitrangadae*, although some authors believe this is simply a darker-pink version of *Lilium mackliniae*, which



Fig. 10 A double-decker living bridge, Richard on the right. In the very high rainfall, timber and/or rope bridges would quickly rot. These fantastic structures, built to cross fast-flowing rivers and gorges, are made from the interwoven aerial roots of rubber trees, *Ficus elastica*. A sapling is planted on each bank but their roots will not join for maybe 10–20 years, and not form a sturdy bridge that will take pedestrians for 30 years or more. The roots are trained over the river on ropes and continuously woven together to form a strong and sturdy structure. Wood, bamboo and stones may be added to form the footpath, but the bridge is made from just the living roots from the two mature trees.

still makes it a spectacular plant). Unfortunately when I visited after the monsoon they had long since finished flowering, but I could see the remains of seedheads of what appeared to be lilies, growing among dwarf bamboo on the steep, free-draining slopes. The tallest seedheads seemed to be in more sheltered areas near

woodland. I have been trying to grow *L. mackliniae* from seed for the past few years, so this showed me the conditions they are likely to prefer when I plant them out in the garden: free-draining soil and an open site with some shelter from the wind and the support of other plants of a similar height.

I learnt so much on this trip, and I am grateful for the funding from the HPS Kenneth Black Bursary Scheme which made the adventure possible. I'm looking forward to continued horticultural successes with the benefit of these lessons from India and I hope that some of these insights will be useful to others. 🌿

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