

Newsletter 58 March 2007

CHILOSCHISTA PHYLLORHIZA

Pauline Lawie

Mary's interesting article on leafless orchids in our last newsletter prompted Don and me to pay closer attention to the ones we have and to reflect on their distribution. We first saw *Chiloschista phyllorhiza* in the Mossman district north of Cairns. For me it was one of those sharp-intake-of-breath experiences. We came across a grove of trees, positively covered with flowers. To see clusters of small, delicate, crystalline, white flowers on thread-like stems dancing up the trunks of trees is something never to be forgotten. I was so taken with the flowers, I paid no attention to the plant until it was pointed out that the flower stem arose from the centre of what looked like a flat green spider – another indelible sight.

Dockrill describes this plant as being "a rather extensive system of broad, flat, rough, greyish green roots", and goes on to describe the flower commenting; "the anther, unlike any other Australian orchid, has two, one on either side, curious hair-like, gland-tipped, wine-coloured appendages." I hope to appreciate these next time they flower – the buds take quite a while to develop, then open and close within a day or so.

Later Don went to investigate a fallen *Backhousia bancroftii* (Johnstone hardwood) not far from our house. When he reported what he thought were *C. phyllorhiza*, along with many more common orchids found in our area, I could not get there fast enough. This was a huge tree which had fallen down hill where partial clearing had taken place for a power line and we had no trouble climbing along the trunk to inspect the plants. There were dozens of them, sitting fully exposed in the burning sunshine. We did our best to rescue whatever plants we were sure were doomed, leaving those that had a chance. Some were so large, one up to 60 cm across, we felt, though stressed, they might still flower, set seed and propagate. That was three years ago. We have been back several times since, but have never seen seed pods. I suspect that new plants are formed by breaks in the roots which then form a new centre, but that does not explain the coverage of plants seen on the trees at Mosman.

On the last occasion we found that the tree had decayed so far the thick bark had fallen. We brought everything with a vestige of a plant home and I put them in the Lazarus corner of my shade house to no avail, except for one tiny piece. This is now growing; the flat green root is suffused with red and it has a red tipped growing point.

I had tied my original plants to a *Flindersia brayleyana*, (Queensland Maple) mount where they had flowered happily, but I feared I would lose them; the roots turned mouldy white and papery as the mount shed its bark when it was constantly wet after the cyclone took the shadehouse roof. Close inspection prompted by Mary's article, however, revealed that the inflorescence arose from those clever roots which had found their way under the bark to the hardwood. Unfortunately, the hardwood is not so hard anymore and I can only hope it does not disintegrate before I can think of what to do next.

Finding these orchids virtually in our own back yard was so exciting we mentioned them to all our neighbours. One, who'd worked in a local timber mill, told us they were very common and used to go through the mill all the time. I wonder if anyone knew they were orchids!

EULOPHIA ZOLLINGERI: A RARE SIGHT AT A LOW ELEVATION

Mary Gandini BSc Dip Research Methods

A friend called me in mid January to ascertain the identity of a leafless orchid that had emerged from the forest floor on the Blue Arrow walking track in Cairns. She had looked in a few books and decided that it was a species of *Dipodium*. However, when she told me it was dark red/brown, I had my doubts and consulted my reference books. The likely subject was *Eulophia zollingeri*, but I still had an open mind as she insisted that her book said *Dipodium* could have brown flowers.



Armed with camera, I met her and a friend and we proceeded to walk up the track. 'Up' it was, as we took the short cut up the fire-break. Up another steep slope a wonderful sight appeared. The sun was shining through a gap in the canopy directly on a metre high flower spike to the left of the track (see photo). I suppose most walkers on the track would have missed this magnificent sight because they are exercise nuts who go from start to finish as fast as possible. My friend did not fit that category.

I was pretty sure that it was indeed *Eulophia zollingeri* as we photographed it. Surely, no one would miss two basal flowers needed to positively identify it, so into a film case they went. Back down at the car we consulted the orchid books which I certainly was not carrying up the track for obvious reasons.



Sure enough there was a photo in Lavarack and Gray (page 44), that matched the spike and the flowers conformed to Dockrill's photo (page 57) and description (page 816). Another interesting point is that this orchid was found well below the 400 metre height mentioned in Dockrill. It was below 200 metres.

My photos are probably not as good as the above. My one-eyedness causes camera shake. Nevertheless, I have included them.

References

- Dockrill, A. (1992), *Australian Indigenous Orchids*, Vols. 1 & 2, Surrey Beatty & Sons Pty. Ltd. NSW.
Lavarack, Bill & Gray, Bruce (1992), *Australian Tropical Orchids*, Frith & Frith Books, Malanda.

APPLICATION OF BIOLOGY AND NUTRIENTS TO NATIVE ORCHIDS

Robert Gourlay, Environmental Scientist, B.Appl.Sc., M.Appl.Sc., January 2007.

The ability of orchids in nature to survive and flourish depends on the conditions of the micro-climate and environment, nutrient recycling and microbial activity. The nutrients can include minerals from rocks and bark and the addition of animal or bird droppings. Also, the surface of the orchid and the surrounding air contains microbes (i.e. bacteria, fungi, etc.), moisture and nutrients. Nitrogen and carbon in the atmosphere and soil are critical components of the recycling process.

Microbes are present on all surfaces and are fundamental to life, nutrient production and recycling. The biology of all plants is designed around microbial activity, as is all other life on Earth. An orchid lives with microbes that are both generalists and specialists (eg. the reliance of terrestrials on a mycorrhizal fungus). This relationship can be upset by changes in conditions, eg. over abundance of pathogenic microbes, an excessive supply of a particular nutrient and presence of harmful chemicals. In nature, this balance is delicate and self-organising, but resilient. Indeed, the environmental conditions in nature (eg. soil microbes, insect pollination, etc) are essential for germination.

Native orchids that live in an unnatural environment face challenges with climatic variability, microbial unevenness, water and nutrient inconsistency. Therefore, some human care is required for orchids in a shadehouse or glasshouse to best assimilate the orchid's natural needs for survival. There is common agreement in the literature about the application of fertilisers for native orchids and this includes:

- Organic fertilisers provide the essential slow release of nutrients.
- Epiphytic orchids require regular applications of fertilisers.
- Liquid fertilisers provide ease of application and ability to provide small amounts of nutrients.
- Fertilisers are best applied during the growing period of late spring and summer.

Little attention is given in the literature about managing or balancing the microbial environment of the orchid to enable effective use of the nutrients within soil, on surfaces (eg. rocks and logs) or as airborne nutrients. There is a symbiotic relationship that started about 400 MYA and drives the relationship of the plant with the soil, water and air. Plants provide microbes with simple sugars (glucose produced from photosynthesis of CO₂, H₂O and sunlight energy) and microbes produce and recycle nutrients back to the plant.

My experience with plants has been that the microbial balancing is the key to plant health and that the conventional method of fixing the chemistry of the soil to manage the plant is ineffective without a microbial balance to convert the nutrients into a plant available form. Microbial balancing provides the building blocks for cell development in plants, animals and humans (i.e. probiotic) and any disruption to the balance impacts on survival or health conditions.

Conventional agriculture has effectively destroyed soil health through ploughing (often turns the home of the microbes onto the surface where their carbon food is mineralized as CO₂ and the radiation from the sun kills off most microbes), burning, chemical fertilisers and sprays. All of these actions destroy beneficial microbes and allows the pathogenic microbes to dominate. This imbalance is the root cause of plant disease and loss of nutrient supply to plants; and the loss of soil structure. Many farmers now know that an unhealthy soil can produce salinity, acidity and disease. Consequently, a healthy microbial environment is a prerequisite for plant and soil health.

I live at Braidwood, NSW (a cold climate with the occasional -8C in winter) and have been experimenting since 2005 with a liquid microbial balancing mix that contains essential nutrients, such as

nitrogen, phosphorous, potassium, sulphur, calcium, etc. The product is called eMCHp and is available from Vital Resource Management (VRM) Pty Ltd based in Townsville, Qld (www.vrm.com.au, 07-4774 6337). The microbes are produced as a balanced population of beneficial cultures (through fermentation) of photosynthetic bacteria, Lactobacillus bacteria, yeasts and specialists that include fungi. This technology is based on Effective Micro-organism (EM) developments by Professor Higa in Japan (search <effective micro-organisms> on the Internet for more information).

The concentrate of eMCHp is mixed with good quality water at a ratio of 1:10. I use a 13 L spray unit in my shadehouse and sunroom to provide a regular application during the growing season. Most growers would need to purchase either a 1L or 25L container. 25L will make 275L of liquid spray and would be suitable for a medium to large sized operation, including a household orchard, vegetables and flower garden. All plants will gain from microbial balancing.

The results of the eMCHp liquid spray have been spectacular, and include:

- Improved vigour, vitality and resilience of the plants.
- Increased seed pod production.
- Increased flowering abundance and period of flowering.
- No disease, less insect attack and a very high level of plant survival (in a highly variable climate)

I have a Cooktown orchid (*D. bigibbum*-pink) that started flowering in late September 2006 and is still in full flower in the second week of January 2007. I acquired a flask of 12 plants of *C. sparksii* in 2005 and their growth after the application of eMCHp has been amazing. All of my orchids have a very healthy appearance with deep green leaves.

My other observations and practices developed from applying the eMCHp are:

- Confine the spraying to the growing period and at least once per week.
- Keep an open mix of organics in the pots as the increased microbial activity will gradually turn the organic materials of leaves and wood particles to compost or fine soil and this may cause some water logging at the bottom of the pot.
- Spray the air around the pot to cover all of the surfaces of the orchid environment.
- Support the occupational health and safety of the microbe's home by avoiding chemical sprays and fertilisers.
- Only prepare a spray mix when required and complete spraying within 4 weeks. I find that 11L (1 of concentrate and 10 of water) is enough to last one month for a total area of 5 x 22 metres. Keep the concentrate and mix in a shaded or cool area, away from direct sunlight.
- Other liquid additives can be added to the spray mix in small quantities (say 10-50ml) and include compost teas, fulvic acid, herbal brews, seaweed or fish emulsions, sea minerals, and specialist microbes.
- Monitor and record the results.

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My congratulations go to Pauline and Donald Lawie for producing this informative newsletter on indigenous orchids.

My apologies go to David Jones if I have not used more recent nomenclature.