



## *Stimulating brews from the hop bushes*

by **Phil Watson**

Hop Bushes, or more endearingly called 'Dods' (*Dodonaea viscosa* ssp.), provide an interesting brew of enthralling plant characteristics, uses and interrelationships. Their robustness enable them to flourish across a diverse range of open vegetation communities spanning areas of continental Africa, America, Australia and India. Their natural habitat includes exposed coastal fore dunes and cliffs, barren rocky ridges and grassy woodlands and they have a reputation as hardy water misers. With their many uses, attractive appearance (vividly coloured 3 to 4 winged fruits and glossy leaves) and natural hedging ability, they deserve their popularity as landscape and revegetation plants.

### **Subspecies of *Dodonaea viscosa* have distinctive characteristics**

*Dodonaea viscosa* has a series of subspecies occurring in open woodlands in south eastern Australia. Their size, distinctive leaf shape and habitat range help to distinguish between them. Key examples include *D. viscosa* ssp. *viscosa* (large, nearly stalkless, elliptical leaf), robust *D. viscosa* ssp. *spathulata*, (spoon shaped leaf), *D. viscosa* ssp. *angustissima*, (delicate linear leaves), the arid area *D. viscosa* ssp. *mucronata* (pointy tipped spoon-shape leaves) and the purple leafed screening or accent favourite from New Zealand *D. viscosa* ssp. *purpurea*.

Recently variegated and prostrate forms of *D. viscosa* ssp. *spathulata* have proved very popular as landscape features and accent plants. All the above subspecies form excellent water wise informal screens or formal hedges (biennial pruning necessary). Some of the most classic forms of these plants can be enjoyed in very exposed sites such as sea cliffs or frontal dunes where wind shearing results in unique and photogenic botanical marvels.

### **Hop Bushes are unusual members of the Soapberry family**

There are 66 *Dodonaea* species, the largest genus of the 150 genera Soapberry family SAPINDACEAE ('Sapo' Latin for soap). Many family members contain a *saponin* glycoside, which provides plants with a detergent-like foaming attribute acting to reduce the water tension when shaken under water. In contrast to the hop bushes that flourish in open dry woodlands, most of the family members are found in closed tropical forests and are prized for their fruits. These include the luscious Lychee (*Litchi chinensis*), Rambutan (*Nephaleum lappaceum*) and the sticky sweet Tamarind seed pods (*Tamarinus indica*). All these tropical members attract pollinating insects and birds by

boldly marketing their flowers with alluring nectaries, scents and colours. Their irresistible fruits ensure wide dispersal of their seeds.

Hop bushes, unlike their tropical relatives, are wind pollinated. The flowers are at the ends of branches and their stigmas having a broad sticky collecting surface ideal for catching airborne pollen. With disproportionate numbers of anthers (relative to stigmas) they are capable of wafting clouds of fine pollen which can travel some 2 kilometres<sup>1</sup>. Hop Bushes, like other wind pollinated native trees and shrubs such as She-oak (*Allocasuarina verticillata*) and South Esk Pine (*Callitris oblonga*), establish themselves in prominent single species groves within low diversity, open plant assemblages, thus improving their chance of receiving pollen. All these species are dioecious (male and female flowers on separate plants) and pollen transfer occurs during the warm dry breezy conditions of late spring to early summer.

### **Hop Bushes enhance bird & insect diversity**

Hop bushes' three dimensional twiggy and leafy frameworks are an open invitation for spiders to weave their intricate webs. These webs are collected for binding nesting material by insectivorous birds such as Brown Thornbills, Flame, Scarlet and Dusky Robins, Welcome Swallows, Strong-billed and Black-headed Honeyeaters, Grey Fantails, Eastern Spinebills and Dusky Woodswallows. Seed eaters such as Bronzewing, Beautiful Firetail, Musk Lorikeet and Green and Eastern Rosella devour the nutritious winged seed clusters before they are either feasted on by seed weevils or glide to ground. Mid storey bushes like hop bush and native box (*Bursaria spinosa*) planted in park style urban landscapes and gardens provide an important role in helping to attract these birds.

### **Seeds are protected by Ants**

Once the Hop Bushes release their seeds ants assist their survival, protecting them from both fire and seed predation. This symbiotic relationship relies on the attraction to the ant of the nutritious fleshy attachments (elaiosomes) which they collect and subsequently bury a couple of centimetres below the soil surface. Here in an underground larder they are protected from surface environmental vagaries. (This dispersal process of seeds by ants has the descriptive name of *myrmecophory* (*myrmex*: Latin for ant)). Abandoned seeds respond to moisture and heat from surface bush fires which crack their hard coats, enabling germination. Critical to the survival of the seedlings is their root's requirement to establish a symbiotic relationship with mycorrhizal fungi. These fungi act as 'soil postmen' supplying water and nutrients to the plants' roots which in turn provides a supply of carbohydrates to the fungi.

### **Hop bushes have important cultural and medicinal roles**

Aborigines and colonists alike had a great affinity for hop bushes, which prove to be true 'people plants' due to their cultural significance and medicinal properties. Known as 'oyster bush' by aboriginal tribes, their conspicuous orange/red winged seed capsules acted as a seasonal indicator which heralded the most opportune time to collect the bounty of succulent oysters from the nearby rocky estuarine foreshores. The colonists, impressed by the similarity in looks and taste the seed capsules had to hops, successfully brewed a tangy, bitter but acceptable beer alternative.

Recent pharmacological analyses of hop bushes reveals the presence of a rich set of active alkaloids, tannins, flavonoids, organic acids and 1-8 cineole rich oils. The relative concentrations of these ingredients vary widely depending on the environmental conditions and habitats where they occur. This variation in relative potency of active ingredients is also subject to seasonal differences at

the time of harvest. Although the hop bushes are found in many distant countries, it is uncanny how unrelated local indigenous populations attributed similar cultural and medicinal uses to this ubiquitous plant.

## **Cultural uses by Aboriginal populations**

Common amongst older aborigines were the persistent problems of toothache as a result of decades of grinding highly fibrous diets. By chewing the leaves of the oyster bush, mild analgesic and euphoric effects provided relief from nagging toothache. Aboriginals used the term 'Pitori' for plants such as hop bushes that acted as painkillers.

Inflammations from rashes and bruises as well as jelly fish and stonefish stings were eased by binding wads of chewed leaf pulp on the affected areas. The bitter juice exuded from the leaves during the preparation of these wads was not swallowed but collected as an antiseptic. The leaves were known to reduce inflammation and swelling as well as imparting an antimicrobial protection to open wounds and infections.

The Central Australian Aboriginals (like indigenous Indian tribes) were reported to rely on the leafy branches as a customary means for relief of flu-like fever and body aches. The leafy branches were smoked on warm ash beds releasing 1-8 cineole rich oils (well known active ingredient in the essential oils extracted from Gum (*Eucalyptus* sp.), Tea Tree (*Leptospermum* sp.), Paperbarks (*Melaleuca* sp.) and native mint bush (*Prostanthera* sp). The smoke would act as a febrifuge (fever reducing agent) by reducing the swelling of mucous membranes and loosening phlegm thus freeing the airways.

Also common amongst colonists and aboriginals were digestion and elimination problems. This was a result of hot weather, poor food hygiene and sub-standard nutrition. Australian aboriginals, like indigenous people from North America, Mexico and South Africa, used the tannins (dried stems/leaves contain 14% tannin) and flavonoids properties of the hop bush by applying poultices of fresh leaves to relieve diarrhoea, stomach and uterine cramps. The typical mode of action (as reported in pharmacological studies) acts to sedate smooth muscle contractions.

The Aboriginals of south eastern Australian preferred to construct their temporary shelters from *D. viscosa* var. *angustissima* simply because the dead branches retained their leaves.

It has been recorded that the South America Peruvian Indians developed a culturally accepted practise of chewing the hop bush leaves in the knowledge that it acted as a substitute for Coca (*Erythroxylum coca*). Like betel nut, the younger viscous (sticky) leaves were often chewed with ash, lime or magnesia to neutralise the organic acids binding the active ingredients, thus enhancing its stimulant and euphoric effects. Of course, akin to betel nut chewers, the lime would have caused rapid tooth decay.

## **Conclusion:**

Like their companion woodland plants, she-oak, native box and black wattle, hop bushes are often disregarded as common uninteresting mid-storey species. However this new brew of information about their rich tapestry of cultural uses and interrelationships hopefully will entice a more in-depth appreciation of the plants and lead to their further use as revegetation or landscape framework species.

<sup>1</sup>Judy West 'A Revision of *Dodonaea* Miller (SAPINDACEAE) in Australia' published in *Brunonia* No. 7, 1984

**Recommended Readings:**

- Whiting, J., *et al.*, 2004. *Tasmania's Natural Flora*. Tasmania's Natural Flora Committee
- Van Wyk, Ben-Erik, 2003. Gericke, N., *People's Plants; A Guide to Useful Plants of Southern Africa*. Briza Publications.
- Closs, J *Dodonea* Study Group 1993 *Dodonea Australian Plants Journal* 17/137
- Latz Peter, *Bushfire and Bush Tucker*, Aboriginal Plant use in Central Australia

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