

# Dragons Blood

Plant extract 'Dragons Blood' has been used since ancient times as a medicine and as a pigment. Jane Pearson provides a background to the substance and looks at the collections at Royal Botanic Gardens Kew.

The blood-red resins of the Dragons Blood trees have many different applications including their use as a pigment in art from medieval times to the 19th century, and also in printing until the 1930s.

The term 'Dragons Blood' is interchangeably used to refer to plants from three quite different families: *Dracaena cinnabari* (Socotra) and *Dracaena draco* (Canary Islands) in the Dracaenaceae family; the palm genus *Daemonorops* (Malaysia), and the genus *Croton* (South America) in the Euphorbiaceae family. All bear red resins.

Attempts to unravel the history of shifting trade and the use of these different plants has been complicated by botanical confusions. The Economic Botany Collections at the Royal Botanic Gardens Kew (curated by the Centre for Economic Botany) contain perhaps the largest (80 accessions) and most reliably identified assemblage of Dragons Blood resins, dating to the 19th century, and which until now had not been examined or analysed.

## Female dragons

The name *Dracaena* is derived from the Greek word 'drakinaia' meaning a female dragon (Stern, 1992). The term 'Dragons Blood' refers to the red resin that Dragon Trees produce. This name dates back to the 1st Century AD when an unknown Greek sailor wrote, in a shipping manual entitled *Periplus of the Erythraean Sea*, of an island called Dioscorida where the trees yielded drops of cinnabar.

Pliny (61-113AD) also wrote about the same island where dragons were said to live, describing how the resin got its name from an Indian legend based on Brahma and Shiva. A dragon, it was said, attacked and bit an elephant, drinking all the elephant's blood in one huge gulp. But as the elephant fell to the ground it crushed the dragon and the resulting mixtures of both creatures' blood was known as Dragons Blood (Lyons, 1974). This story relates to the Island of Socotra in the Yemen and *Dracaena cinnabari* is endemic to the island.

The species was first named and described



Jane Pearson recently graduated with the Kew Diploma in Horticulture (Honours) and is about to take up a new post as botanical house manager at Bristol. Her research interests include economic botany and natural history. In 2001 Jane won the Institute of Horticulture Aberconway Medal and Prize for her dissertation 'Dracaena a source of Dragons Blood resin: the history, botany and analysis of the Dragons Blood collection at the Royal Botanic Gardens Kew'. She now plans to visit Tenerife to see the famous Dragon Tree at Icod.

by the Scottish botanist Sir Isaac Bailey Balfour when he visited the island in 1880 (Balfour, 1888). This species was the original source of Dragons Blood in the ancient world. Indian merchants traded in the red resin, importing it to the Mediterranean where it was held in esteem for its magical properties and use as a red colouring.

## Chemical analysis

Glasgow's Professor of Chemistry James Dobbie and G Henderson conducted a chemical analysis at the request of Sir Isaac Bailey Balfour in 1883 and compared samples of *Dracaena cinnabari* with a number of other red resins known as Dragons Blood. The resins came from three different collections including Kew's Economic Botany Collections.

They concluded that the resins differed widely in both appearance and purity even if they were from the same locality.

Sadly, today *Dracaena cinnabari* has an International Union for the Conservation of Nature (IUCN) Category of Threat: Endangered, with poor regeneration and reproduction, plus grazing, as the major threats. The resin is still harvested on a small scale and Socotran pottery is decorated with Dragons Blood, the patterns being centuries old. It is also used to dye wool, decorate houses and even as a lipstick (Alexander, 1996).

The resin is used in Socotran folk medicine and throughout Arabia for treating a wide range of ailments both internally and externally. It has strongly astringent properties as well as being a muscle relaxant (Milner, 1992). Due to its antiseptic properties, it is used for treating dysentery, diarrhoea, haemorrhage and external ulcers in Yemeni folk medicine (Milburn, 1984). Miller (1988) mentions its use as a colouring matter for varnishes, tinctures, toothpastes, plaster, and for dyeing horn to make it look like tortoiseshell.

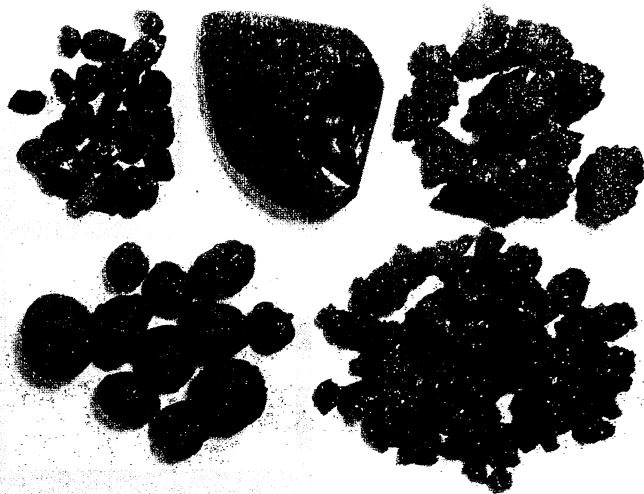
Dracaenas are monocotyledons in the Dracaenaceae family. The genus comprises about 100 species, according to Kubitzki (1998). Since the beginning of the 19th century, the genus has repeatedly been confused with quite unrelated genera, such as *Agave*, *Yucca* and particularly with *Cordyline*. Although variable, the genus as a whole is a homogenous group of considerable ancestry.

## Reclassification

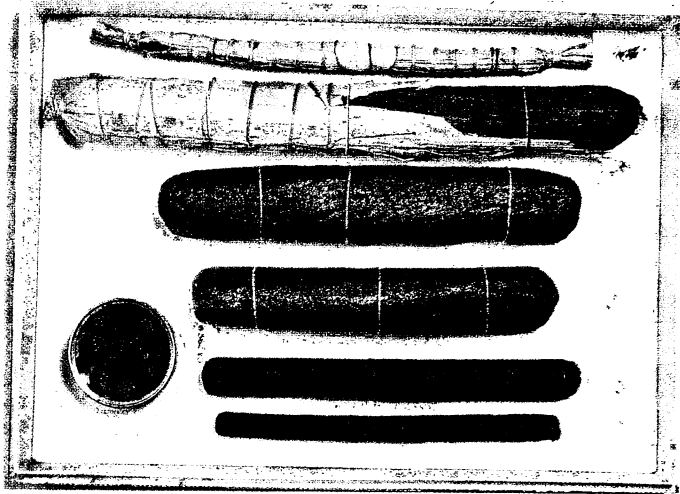
In the past, *Dracaena* has been classified in the Liliaceae and the Agavaceae families. Dahlgren undertook a major reclassification of the monocots in the 1980s which involved dividing the huge Liliaceae family. As a result, *Dracaena* went into a separate family in its own right, along with other genera such as *Calibanus*, *Cordyline*, *Dasyllirion*, *Nolina* and *Sanseveria* (Mabberley, 1997). *Dracaena* is about to be reclassified into the Convallariaceae family according to the Angiosperm Phylogeny Group 1998.

All Dragon Trees are extremely slow

PHOTOS: A. MICROBRIGGS KEW



Five *Dracaena cinnabari* specimens illustrate the variation seen between the different grades.



*Daemonorops propinqua* (EBC 56395) processed in 'Reeds' donated by the Pharmaceutical Society. The longest reed is 30cm long. The leaves used for wrapping the resin are probably from the genus *Licuala*, a member of the palm family.

growing. Being monocotyledons their growth habit is the same as a palm, with growth occurring at the apex of the stem and the long, strap-shaped leaves borne in a terminal rosette. Unlike many palms though, as the trees mature branching occurs to give a dense umbrella-like crown with a characteristic leaf-scarred trunk. The inflorescence consists of a terminal panicle with short or long branches bearing clusters of small, fragrant, white or greenish flowers. The fruits are globose - red-orange or yellow berries, three lobed and containing one to three seeds (Press, 1994). *Dracaena cinnabari*, *D. draco* and *D. ombet* from East Africa all form a distinctive group within the genus due to their habit and ability to produce Dragons Blood resin (Balfour, 1888).

The Canary Island Dragon Tree (*Dracaena draco*) was first described in a publication called *The Canarian* by Bouter and Le Verrier in 1402.

The natives of the Canaries were called Guanches. They worshipped the trees and extracted the red resin and took it to caves where they embalmed their dead with it. This ancient race was wiped out by a form of typhus fever, known as 'Modorra', shortly after the Spanish Conquest (Lyons, 1974).

### Fantastical stories

Fantastical stories still abounded during this time about the resin being the blood of real dragons. This belief was especially strong amongst herbalists, perhaps allowing them to charge high prices for this exotic substance. Gerarde, in his *Herbal* (1633), described the tree in detail and stated it was used for 'overmuch flowing of the courses, in fluxes, dysenteries, spitting of blood and fastening of loose teeth'. It was used to treat gonorrhoea, stoppages of urine, watery eyes and minor burns (Parkinson, 1640). Italian violin makers also made a fine varnish from it to stain violins.

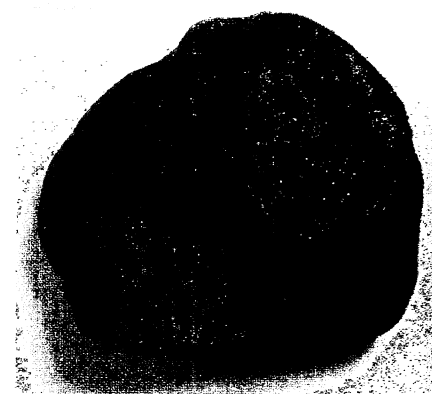
By 1853, the use of Dragons Blood had started to decline. Lindley, in the *Vegetable Kingdom*, stated it was an astringent resin, sometimes employed in the treatment of diarrhoea and passive haemorrhages, but

scarcely known to modern druggists.

During the late 1880s a series of reports in the *Gardeners Chronicle* described the Great Dragon Tree of Orotava, Tenerife, which was 19.5 metres tall with a 13.5 metre circumference and estimated age of 6,000 years - since disproved. Though badly damaged by a storm in 1817, it finally fell when a hurricane hit the island in 1867.

The tree at Icod, Tenerife, is the largest on the island now. Again, its age is very difficult to estimate as monocots do not possess annual rings, although it is likely to be well over 700 years old. Today, this species has an IUCN Category of Threat: Vulnerable, with plant collectors and grazing as the major threats.

*Dracaena draco* is widely cultivated commercially as an architectural foliage plant in both dry subtropical climates and as an indoor plant in cooler regions. It can be



*Daemonorops propinqua* (EBC 35482) a very large lump up to 13cm across.

propagated from seed or taken as basal shoot or stem cuttings. Flowering can sometimes take up to 30 years.

In recent times there has been very little new

### Resin collection and processing

#### *Dracaena*

The red resin exudes naturally through fissures in the trunk. It is collected by widening these fissures with a knife. The Socotrans still harvest it in this way:

According to Balfour, 1883, there were three grades: The Arabic name 'Edah' refers to the gum.

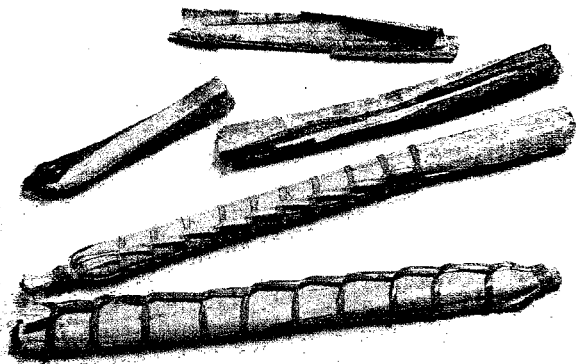
- *Edah amsellah*: tears - the purest grade and most valuable
- *Edah dukkah*: fragments of tears
- *Edah mukdehah*: the most inferior grade - fragments of resin, bark and dust, melted together to form a flat cake and then cut into smaller portions.

#### *Daemonorops*

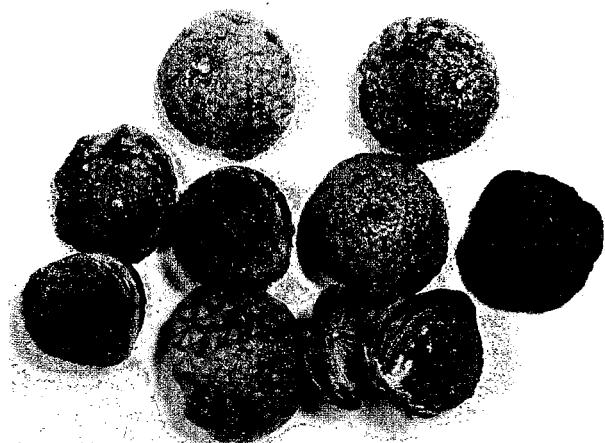
Although *Daemonorops* resin is similar in appearance, its origin and preparation are different to *Dracaena* resin. The fruits are covered in small imbricate scales through which the resin exudes, forming a brittle, red resinous layer on the outside of the fruits. Collection occurs just before the fruit is fully ripe.

The fruits are allowed to dry and shaken or beaten together in sacks or baskets in order to separate the resin. The resinous powder is then sifted to remove the scales, softened by heat and moulded into cakes or sticks when cool.

Again, there are various grades of purity (Howes, 1949). Although used in the same way as *Dracaena*, the powdered form of *Daemonorops* was used extensively, especially in America, as an acid resist by photo-engravers up until the 1930s (Pankow, 1988). It also appears to be used in both traditional Chinese medicine and Chinese herbal folk medicine (C Leon, Kew, pers. comm). *Daemonorops* is traditionally used to stimulate the circulation, promote tissue regeneration by aiding the healing of fractures, sprains and ulcers and to control bleeding and pain (Bensky, 1993).



This Pharmaceutical Society *Dracaena draco* 'Reed' specimen (EBC 36516) is more likely to be *Daemonorops draco*.



*Daemonorops propinquus* (EBC 35500), showing the colour of the resin and the seed scales. It is the fruit that yields the resin.

information available about Dragons Blood. Both Emboden (1974) and Lyons (1974) give good accounts of the history of Dragons Blood. Dragons Blood is widely available on the Internet and is used in witchcraft and burnt as incense, though this source is more likely to be *Daemonorops* or *Croton* due to the scarcity now of *Dracaena* resin.

Recent research has found the resin from *Dracaena* contains various flavonoids that are beneficial to man due to their antioxidant activity. This is indeed encouraging news if this ancient red resin can continue to play a valuable role even today. But in order to do so the conservation issues urgently need to be addressed to prevent the further decline of these legendary Dragon Trees. □

**Acknowledgements**

This article is from the author's work, *Dracaena A Source of Dragons Blood Resin: The History Botany and Analysis of the Dragons Blood Collection at The Royal Botanic Gardens Kew*. The work was undertaken as part of the Kew Diploma in Horticulture dissertation. The author would like to thank the staff at the Royal Botanic Gardens Kew for their help and support in the preparation of this dissertation: in particular Dr Hew Prendergast, curator and Dr Mark Nesbitt, economic botanist, both of the Centre for Economic Botany, RBG, Kew.

**REFERENCES**

Alexander, D and Miller, A (1996) Saving the Spectacular Flora of Socotra *Plant Talk* 7 19-22

Balfour, I B (1883) *The Dragons Blood Tree of Socotra*. Translation Royal Society Edinburgh. XXX 619-623

Balfour, I B (1888), *Botany of Socotra*. Translation Royal Society Edinburgh. Robert Grant & Son, Edinburgh.

Bensky, D and Gamble, A (1993) *Chinese Herbal Medicine Materia Medica*. China.

Boutier, P and Le Verrier, J (1872) *The Canarian, or Book of the Conquest and Conversion of the Canarians in the Year 1402*, by Jean de Bethencourt. Vol. 46 Hakluyt Society Publications, London.

Emboden, W A (1974) *Bizarre Plants, Magical, Monstrous and Mythical*. Studio Vista, London.

*Gardeners Chronicle Reports*: 1868 The Great Tree of Orotava p30, 1872 Illustration p765, 1880 p749, 1888 p444, 712-713

Gerarde, J (1633) *The Herbal or General Historie of Plants*. London.

Howes, F N (1949) *Vegetable Gums and Resins*. Chronica Botanica Company, Waltham, Mass. USA.

Kubitzki, K (1998) *The Families and Genera of Vascular Plants Volume 3 Flowering Monocotyledons*. Springer Publishers, London.

Lindley, J (1853) *The Vegetable Kingdom. 3rd Edition*. London.

Lyons, G (1974) In Search of Dragons the Plant that Roared. *Cactus and Succulent Journal* 56:267-282.

Mabberley, D J (1997) *The Plant Book. Second Edition*. Cambridge University Press, Cambridge.

Milburn, M (1984) *Africa* 39 (3), 486-493.

Miller, A G and Morris, M (1988) *Plants of Dhofar the Southern Region of Oman, Traditional, Economic and Medicinal Uses*. The Office of the Adviser for Conservation of the Environment, Diwan of Royal Court Sultanate of Oman.

Milner, J E (1992) *The Tree Book*. Collins & Brown Ltd, London.

Pankow, D (1988) Dungeons and Dragons Blood: The Development of Late 19th and Early 20th Century Platemaking Processes. *Journal of the American Printing History Association*. Vol X No 1 21-35.

Parkinson, J (1640) *Theatricum Botanicum*. London.

Pearson, J (2001) *Dracaena, A Source of Dragons Blood Resin: The History, Botany and Analysis of the Dragons Blood Collection at The Royal Botanic Gardens Kew*. Unpublished Kew Diploma in Horticulture Dissertation.

Plinius Secundus (1601) *The Historie of the Worlde*. London.

Press, J R and Short, M J (1994) *Flora of Madeira*. Natural History Museum, HMSO, London.

Stern, W T (1992) *Dictionary of Plant Names for Gardeners*. Cassell Publishers Ltd, London.

**The Dragons Blood Collection, RBG, Kew**

Sir William J Hooker, the first official director of Kew, founded the Economic Botany Collections (EBC) in 1847. The aim was to 'render great service, not only to the scientific botanist, but to the merchant, the manufacturer, the physician, the chemist, the druggist, the dyer, the carpenter and the cabinet maker and artisans of every description, who might here find the raw materials employed in several professions correctly named.'

The collection is housed within the Sir Joseph Banks building, home to the Centre for Economic Botany (CEB). The collection comprises over 76,000 botanical samples and artefacts from all around the world, encompassing both the historical and the contemporary. A computerised database provides reference material such as wood samples for anatomical research, extracts for chemical analysis and raw materials such as fibres and waxes for industrial assessment.

The Dragons Blood Collection has 80 accessions from three distinct genera from three very different families. It is a historical collection, which until now had never been examined. The collection comprises 34 *Dracaena* accessions, 40 *Daemonorops* and six *Croton*.

The author's research involved a thorough survey of botanical and pharmaceutical literature. A thorough analysis of the Dragons Blood Database at Kew was conducted, including all the three different genera, and information compiled on the geographical origins, collection/donation dates and the names of the donors.

The majority of the *Dracaena* collection comprises of *Dracaena cinnabari* from the island of Socotra. Collection first started in the 1870s and continued through to the 1890s, peaking in the 1880s, the main donors being Sir Isaac Bailey Balfour and the Pharmaceutical Society. Other famous collectors include Sir John Kirk of Dr Livingstone fame, Georg Schweinfirth and Fredrich Welwitsch.



# THE *Horticulturist*

*The Journal of the Institute of Horticulture*



VOLUME 11 No. 2  
SPRING 2002