

DRAGON'S BLOOD – THE MYSTERY OF A TRADITIONAL HERBAL PRODUCT

By R.O.B. Wijesekera



Preamble

Dragon's Blood is the name applied to a range of resinous materials that originate from a number of botanical species. The deep red exudate resin has been used as a remedy for several human ailments, as well as artistic applications, throughout the ages by diverse cultures. Several red resins used in traditional medicine are described as such in the medical literature through the ages. The species from which these resins have been gathered are diverse in nature and are found in different geographical regions. The original species is believed to have come from the Indian Ocean island of Socotra, now a part of Yemen. There are several other sources from which dragon's Blood is believed to come from such as: Canary Islands, Madeira, from South East Asia, East and West Africa, and Southern America. In one version of the story of Ancient Greece, Landon the hundred headed dragon, guardian of the Garden of Hesperides, was killed by Atlas as

punishment or by Hercules, and while bringing back three golden apples from the garden Landon's dark red blood was spilt upon the land wherefrom there grew the trees which spilt blood from the trunks. These were known thereafter as "Dragon Trees". In the first century A.D. a Greek sailor was said to have written of an island by the name of Dioscorida where the trees yielded drops of "cinnabar". According to another story the struggle between a dragon and an elephant resulted in the spilling and mixing of the blood of both which yielded a magic substance with medicinal properties.



Tapping of Dragon's Blood and the dried commodity in Socotra Islands

Sources of Dragon's Blood

The Vermillion red exudate of the Tree *Dracaena cinnabari*, was used as a medicine and a dye in the Mediterranean region in ancient times and was very highly valued.

However Dragon's Blood was a name applied to the red exudate from several other sources such as :

- East Indian Dragon's Blood – from the fruit of *Daemonorops draco* (Wild) (Blume)
- Socotran or Zanzibar Dragon's Blood, - the exudate from *Dracaena cinnabari* Balf.
- Canary Dragon's Blood – exudates from incisions on the trunk of *Dracaena draco* (L).
- West Indian Dragon's Blood from exudates of *Pterocarpus draco* L.
- Mexican Dragon's Blood from the resin of *Croton lechleri* Mull. Arg,
- Venezuelan Dragon's blood from the resin of *Croton gossipifolium* Vahl.

It is now believed that although Dragon's blood was originally produced from *Dracaena cinnabari*, later from *Dracaena draco*, and more recently from *Dracaemonorops* spp., the term Dragon's blood is generally used for all kinds of resins and saps obtained from four distinct plant genera namely: *Croton* (Euphorbiaceae), *Dracaena* (Dracaenaceae), *Daemonorops* (Palmaceae) and *Pterocarpus* (Fabaceae).

A species identified as *Pterocarpus marsupium* Roxb., is recorded in The Sinhalese Materia Medica by John Attygalle, and is described as not having been known to the Ancient Hindus as a medicine. Attygalle notes that the gum which this tree yields is of blood red colour, and that it had been collected from this source and exported to Europe as Indian Kino. In the Sinhala language it is known as "Gammalu" and is used by Ayurvedic physicians in the country, possibly drawing from the local Deshiya practices. The *Pterocarpus* spp. includes the species *Pterocarpus santalinus*, which is popularly known as Red Sandalwood and extensively used in the Ayurvedic pharmacopoeia. In Sinhala it is called Rath Handun, although it bears no resemblance to sandalwood itself.

Historical aspects

The multiple uses of Dragon's blood through ancient times to this day provide ample evidence of its versatility. From the beginning it was prized as a dye as well as a medicine. It provided a dense and spectacular colouring matter for paints and varnishes and was even used in toothpastes, tinctures, and plasters. When substances such as horn were dyed with devils blood they could simulate the appearance of tortoise shell and was used for this purpose in ancient times. People in the island of Socotra had used the resin from *D. cinnabari* for dying of wool, pottery and it is believed to have been used as a form of lipstick.

In conformity with the belief that the resin was the blood of a mythical animal, it found use as a substance employed in magic rituals as well as in alchemy. In India too, the resin from both *Dracaena* and *Daemonorops* were used in religious rituals. The resin from the *Daemonorops* was used in ancient China as a popular varnish for wooden furniture. They were used to colour the surface of paper for banners and posters used for important special occasions such as the Chinese New Year. These red resins also found use in enhancing the colour of precious stones, staining glass, marble, and for varnishing the wood of violins, which reputedly enhanced the instrument's tone.



Varnished violins



Stained Glass

The Spanish explorer Bernabe Cobo recorded that the sap of the *Croton* spp. was used widely by the indigenous people of South America in the 1600's as a medicine and for paints varnishes and spiritual occasions. In the African folk magic or voo doo the resin is used as an incense to cleanse a space which has been polluted by negative influences. In neo pagan witchcraft it is used to enhance the potency of spells for protection, love, and sexuality.

Traditional Uses in Medicine.

The ancient Greeks, Romans and the Arabs employed the resin for a variety of medicinal purposes. Dioscorides as well as other Greek healers wrote of its wide powers as a medicine. Dragon's blood was used in the treatment of dysentery, diarrhea, and hemorrhage, in excessive bleeding in menses and in external ulcers. Perhaps its resemblance to blood itself made it a candidate treatment for bleeding conditions in accordance with the celebrated "doctrinaire of signatures", where like was seen as the logical remedy for like."

In Chinese Traditional Medicine, Dragon's Blood derived from the species *Daemonorops*, is used to stimulate the circulation of blood. It is also reputed to promote the regeneration of tissue, and aid the healing of fractures, ulcers and control bleeding and pains and inflammations. In the South American region the sap of the species *Croton lechleri*, is used in the treatment of fractures, leucorrhea, piles and hemorrhoids, and to speed up internal healing following an abortion. The resin exudes as a sap from mature trees and is harnessed by tapping.



Tapping the exudate - Traditional



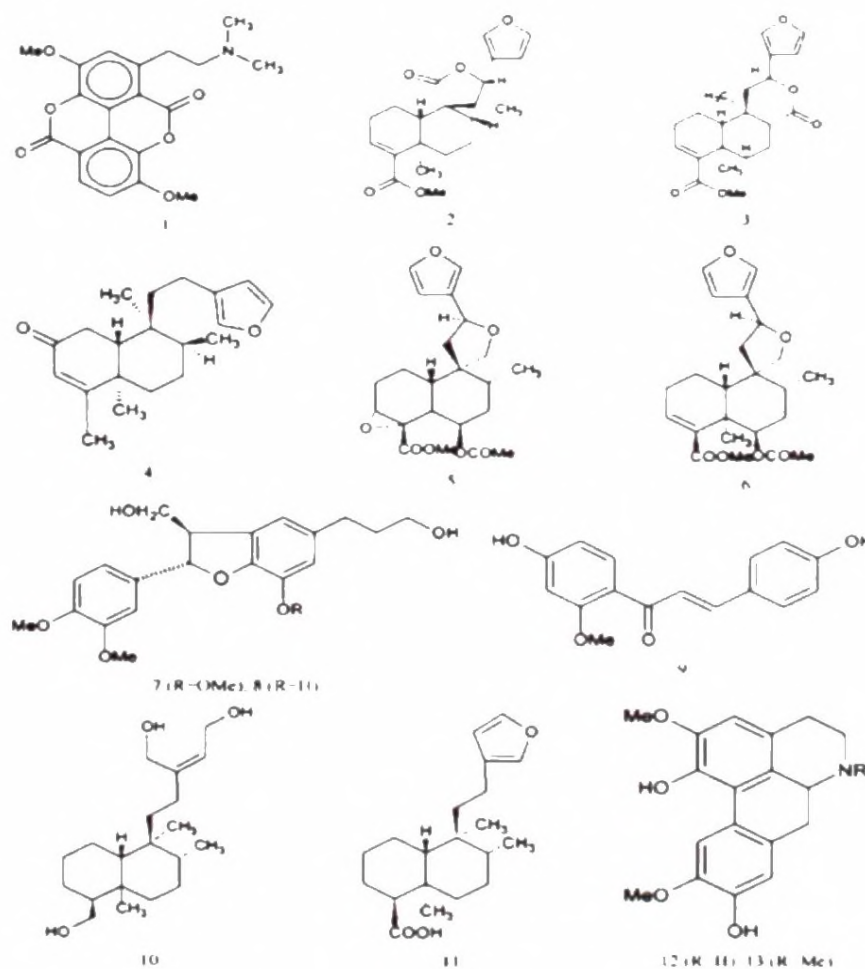
Gammalu Tree (Sri Lanka)

Chemical composition

The chemistry of Dragon's Blood is a complex array of compounds rendered even more varied by the fact that the sources of the resin are also many.

The chemical constituents have been recently studied with the ethnomedically revealed activity in view i.e. Reverse pharmacology. Antibacterial properties are attributed to the presence of such phenolic compounds as 2,4,6,-trimethoxy benzene, 1,3,5,-trimethoxybenzene, chrolechinic acid, and korberins A and B. The sap on *Croton* spp has been extensively studied chemically and antiviral, antifungal properties have been attributed to it.

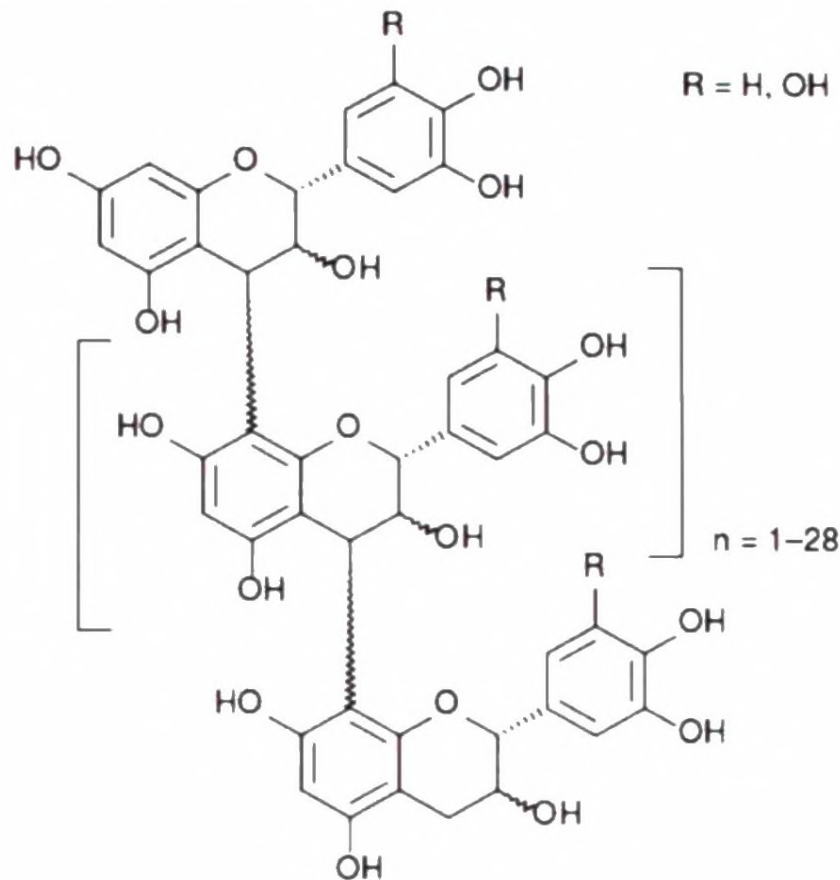
Taspine an alkaloid isolated from the *Croton* spp has been shown to contain cytotoxic activity and it has cicacitrant or wound healing properties as well. Immunomodulatory, antioxidative, antiproliferative, and mutagenic effects of dragon's blood as well as some of its constituents have received attention from scientific researchers.. Extracts have also been proven to combat Diarrhea although the effect is not attributed to any one constituent. Over forty different compounds have been isolated from various forms of Dragon's Blood and chemically characterized, during the period of the 1990's and tested in cellular as well as animal experiments. Many of the medicinal properties have given credible evidence in animal models, which makes Dragon's Blood appear a goldmine of compounds with a variety of bioactivities awaiting further research.



Varieties of structures representing some of the compounds isolated from Dragon's Blood

An interesting case is that of the constituent Crofelemer- a complex polyphenolic compound which under the trade name of Fulyzac is a drug which underwent development for the treatment of Diarrheas associated with anti-HIV drugs such as nucleoside analogue reverse transcriptase inhibitors and protease inhibitors. It has been approved in 2012 by the US Food and Drug Administration.

Chemical Structure of Crofelemer



It is the second botanical drug approved by the FDA. The first was green tea extract called Veregen in 2006.

As could be expected the different species such as the *Croton* spp., the *Dracaenia* spp., the *Dracaenopsis* spp., and the *Pterocarpus* spp., each may have differing arrays of chemical compounds and as such will possess somewhat different biological activities. Commercial samples of Dragon's blood may undoubtedly be mixtures.

The Sri Lankan variety *Pterocarpus marsupium*, is relatively rare and its use is not documented in texts other than the cited instance of Attygalle's *Material Medica*. The medicinal uses cited in *Plant Families* includes the leaves as an application for skin ailments, the flowers as a febrifuge. The heartwood is used as a decoction for a wide variety of ailments. And the gum is deemed useful in gastralgia, and "vitiating conditions of Pitta", including diarrheas, psoriasis, and ulcers.

Now that the FDA have "approved Crofelemer, for symptomatic relief of non-infectious diarrhea in patients with HIV-AIDS on retroviral therapy", it will make the Sri Lankan

variety an interesting research study for comparison with others in respect of its chemical constituents and local use.

Quality in Products. and Resource conservation

Dragon's Blood as a name has been applied to red coloured resins drawn from a variety of sources and from a wide range of geographical regions.. Accordingly there is a need to find methods to identify and classify the commercial products with respect to sources, composition and purity. The resins of commerce differ widely from one another in purity and even in appearance. The early methods were based on solubility in several solvents but recently Edwards and collaborators have devised a method based on Fourier transform Raman Spectroscopy. Edwards' group regard the product derived from the Socotra island as the parent variety. They have devised a method to identify "fake" varieties from genuine exudates derived from the accepted sources.

Another factor that looms large is the result of overexploitation of the sources and this has raised serious concerns with international agencies taking steps to stem the certain loss of most of these endangered species and safeguard the sources with measures for conservation.

For Additional Information

1. Attygalle J. *Sinhalese Materia Medica* p 60
2. Gupta, D., Bleakley B., & Gupta R., (2008) *Dragon's Blood: Botany, Chemistry & Therapeutic uses.* *J.Ethnopharmacol.*, 361, 80
3. Grieve M., *A Modern Herbal*
4. Alexander D., & Miller A., (1995): *Socotra's Misty Future.* *New Scientist.* 142, 32
5. http://cms.herbalgram.org/press/2013/FDA_approves_crofelemer.html
6. Arnone et al. (1997) *Constituents of Dragons Blood.* *J. Nat. Prod.*, 60, 971-975.
7. Edwards, H.G.M. et al: (1997) *Characterisation of ancient resin ... J.Raman Spectroscopy.* 28, 243-249. Also (2004) *Analyst:* 129, 134-138.
8. *Plant Family:* http://www.agri.ruh.ac.lk/medicinalplants/medicinal_plants/families/leguminasae/plants/ga...

**You cannot do anything at all
without knowing that one word courage.**

Sadie Mintz, 105 year old American author.