

Review

Dragon's blood: Botany, chemistry and therapeutic uses

Deepika Gupta^a, Bruce Bleakley^b, Rajinder K. Gupta^{a,*}

^a University School of Biotechnology, GGS Indraprastha University, K. Gate, Delhi 110006, India

^b Department of Biology & Microbiology, South Dakota State University, Brookings, South Dakota 57007, USA

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Abstract

Dragon's blood is one of the renowned traditional medicines used in different cultures of world. It has got several therapeutic uses: haemostatic, antidiarrhetic, antiulcer, antimicrobial, antiviral, wound healing, antitumor, anti-inflammatory, antioxidant, etc. Besides these medicinal applications, it is used as a coloring material, varnish and also has got applications in folk magic. These red saps and resins are derived from a number of disparate taxa. Despite its wide uses, little research has been done to know about its true source, quality control and clinical applications. In this review, we have tried to overview different sources of Dragon's blood, its source wise chemical constituents and therapeutic uses. As well as, a little attempt has been done to review the techniques used for its quality control and safety.

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* Corresponding author. Mobile: +91 9871263252; fax: +91 11 23865941/2.
E-mail address: rk67ap@yahoo.com (R.K. Gupta).

1. Introduction

Plants are used worldwide for the treatment of diseases and novel drugs continue to be developed through research from these plants. There are more than 20,000 species of higher plant, used in traditional medicines and are reservoirs of potential new drugs. As the modern medicine and drug research advanced, chemically synthesized drugs replaced plants as the source of most medicinal agents in industrialized countries. Nevertheless plants are an important source of lead compounds. However, in developing countries, the majority of the world's population cannot afford pharmaceutical drugs and use their own plant based indigenous medicines.

Dragon's blood is a deep red resin, which has been used as a famous traditional medicine since ancient times by many cultures. The term "Dragon's blood" refers to reddish resinous products, usually encountered as granules, powder, lumps or sticks used in folk medicine. Dragon's blood has been used for diverse medical and artistic applications. It has astringent effect and has been used as a hemostatic and antidiarrhetic drug. The origin of Dragon's blood is believed to be from Indian Ocean island of Socotra, now part of Yemen (Angiosperm Phylogeny Group, 1974). However, there exists a great degree of confusion regarding the source and identity of Dragon's blood. Several alternative sources of Dragon's blood from Canary Islands, Madeira, and South East Asia and also from East and West Africa have been identified (Alexander and Miller, 1995). Dragon's blood was a name applied to many red resins described in the medical literature, e.g. East Indian Dragon's blood (from the fruit of *Daemonorops draco* (Willd.) Blume), Socotran or Zanzibar Dragon's blood (exudates of *Dracaena cinnabari* Balf. f.), Canary Dragon's blood (exudates formed from incisions of the trunk of *Dracaena draco* (L.) L.), West Indian Dragon's blood (exudates of *Pterocarpus draco* L.), Mexican Dragon's blood (resin of *Croton lechleri* Müll. Arg.) and the Venezuelan Dragon's blood (resin of *Croton gossypifolium* Vahl) (Sollman, 1920).

Mabberley (1998) suggests that Dragon's blood was produced originally from *Dracaena cinnabari*, later from *Dracaena draco* and more recently from *Daemonorops* spp. Zheng et al. (2004a,b,c) confirms this view and suggests *Pterocarpus* spp., *Daemonorops draco* and *Croton* spp. as substitutes for *Dracaena* spp. Thus, the term "Dragon's blood" in general is used for all kinds of resins and saps obtained from four distinct plant genera; *Croton* (Euphorbiaceae), *Dracaena* (Dracaenaceae), *Daemonorops* (Palmaceae), and *Pterocarpus* (Fabaceae).

1.1. Mythology

According to a Greek myth, Landon, the hundred-headed dragon, guardian of the Garden of the Hesperides (the nymph daughters of Atlas, the titan who holds up earth and heaven) was killed by either Hercules (in his quest) or Atlas (as punishment) while bringing back three golden apples from the garden, depending upon the version of the myth. Landon's red blood flowed out upon the land and from it sprung up the trees known

as "Dragon Trees" (The Eleventh Labor of Hercules: The Apples of The Hesperides).

Dragon's blood was also called "Indian cinnabar" by Greeks writers. The name "Dragon's blood" dates back to the 1st century AD when a Greek sailor wrote, about an island called Dioscorida where the trees yielded drops of cinnabar, in a shipping manual "Periplus of the Erythrean Sea". Plinius (1601) also described that the resin got its name from an Indian legend based on Brahma and Shiva. Emboden (1974) and Lyons (1974) had also summarized the history and mythology of Dragon's blood. According to Lyons, the struggle between a dragon and an elephant that, at its climax, led to the mixing of the blood of the two creatures resulted in a magical substance, "Dragon's blood" imbued with medicinal properties.

1.2. Historical uses

The crimson red resin was highly prized in the ancient world. Dragon's blood (*Dracaena cinnabari*) was used as a dye and medicine in the Mediterranean basin. Miller and Morris (1988) mention use of *Dracaena* resin as a coloring matter for varnishes, tinctures, toothpastes, plaster, and for dyeing horn to make it look like tortoiseshell. Mabberley (1998) also notes that resinous sap produced via incisions in the bark or stem of the *Dracaena cinnabari* was used by the Ancients to stain horn to resemble tortoiseshell. People in Socotra used resin from *Dracaena cinnabari* for dyeing wool, glue pottery, breath freshener, to decorate pottery and houses and even as lipstick (Alexander and Miller, 1996). Due to the belief that it is the blood of the mythical animal, the dragon, it is also used in alchemy and for ritual magic.

Dragon's blood from both *Dracaena* and *Daemonorops* were also used for ceremonies in India. Sometimes *Dracaena* resin, but more often *Daemonorops* resin, was used in China as red varnish for wooden furniture. These resins were used to color the surface of writing paper for banners and posters, used especially for weddings and for Chinese New Year. These red resins were also used as pigment in paint, enhancing the color of precious stones and staining glass, marble and the wood for Italian violins. Fulling (1953) reported that *Daemonorops* resin was used in the preparation of drawings. Powdered forms of *Daemonorops* resin were used extensively as an acid resist by photoengravers during the 1930s (Pankow, 1988). In modern times *Daemonorops* resin is still used as a varnish for violins, in photoengraving, as an incense resin, and as body oil. *Daemonorops* resin is also added to red ink to make "Dragon's Blood Ink," which is used to inscribe magical seals and talismans.

Spanish naturalist and explorer P. Bernabé Cobo (1956) recorded for the first time that *Croton*'s sap was used widely throughout the indigenous tribes of Mexico, Peru, and Ecuador in 1600s. In African-American folk magic or voodoo this resin is used in mojo hands for money-drawing or love-drawing, and is used as incense to cleanse a space of negative entities or influences. In neopagan witchcraft, it is used to increase the potency of spells for protection, love, banishing and sexuality.

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