

ETHNOPHARMACOLOGY OF DAMMUL AKHWAIN (*DRACAENA CINNABARI*), A COMMONLY USED DRUG IN THE UNANI SYSTEM OF MEDICINE: A REVIEW

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Abstract:

The Unani system of medicine provides a detailed description of the medications utilized, in particular, during surgical procedures. One significant drug mentioned in the literature on surgery in Unani medicine is called Dammul Akhwain (DA). *Dracaena cinnabari* Balf. f. is the scientific name for DA, and it is also referred to by the names Bejasar Gond, Khoon Sioshan, Fatiruddam, Damul Taneen, and Damus Shaaban. When administered, it has hemostatic and wound-healing properties. It is employed in the treatment of many kinds of *Qurūh* (wounds), as mentioned in classical Unani literature.

Key words: Dammul Akhwain, Healing, Jarahat, Quruh, Unani, Wound

Introduction

Herbal derivatives are now considered the foundation for a large proportion of medications in both traditional and modern medical systems [1]. Plants are used to treat diseases all over the world,

and new drugs are being developed as a result of plant research. There are over 20,000 species of higher plants that are used in traditional medicine and are potential drug reservoirs [2]. *Dracaena cinnabari* Balf. f. is an endangered endemic species native to Socotra Island that grows on Yemen's southern coast [3]. Dragon's blood is thought to have originated on the Indian Ocean island of Socotra, which is now part of Yemen. *Dracaena* is derived from the Greek word 'drakainia', which means "female dragon." This tree yields a deep red resin known as Dragon's blood or Two Brothers' blood [4].

The name "Dragon's blood" describes reddish resinous items that are typically found as lumps, granules, powder, or sticks and have been utilized as a well-known traditional medicine by various civilizations from ancient times. Dragon's blood has established itself as a well-liked supplemental or alternative medicine used in the treatment of numerous ailments. Dragon's blood either spontaneously or after cutting the stem exudes from the *Dracaena* plant. On the stem, the resin may morphologically/physically appear as chips or drops (tear-like). In the Mediterranean region, dragon's blood (*Dracaena cinnabari*) was employed as a colour and drug. There are between 60-100 species in the genus *Dracaena*. It is a member of the Dracaenaceae or Asparagaceae family [5].

Morphological features

The evergreen *Dracaena cinnabari* tree has a typical umbrella-shaped crown from a ramification of branches known as "dracoid." Among monocotyledonous plants, *Dracaena* species stand out due to their ability to secondary thicken stems and roots. Large, single-trunked *D. cinnabari* trees can reach heights of up to 10 meters. Its branches are crooked/dracoid and delicate, its bark is paper-thin and silky, its leaves are spherical and pinnate, its flowers are orange, and its seeds are black. When branches are cut, a scarlet liquid seeps out that immediately hardens (Fig.-1; Fig.-2). The availability of atmospheric moisture has an impact on the crown shape, which is adapted to arid conditions. Tough leaves can grow up to 60 cm long and 4 cm wide. They are densely tufted, dark green, and elongated. As a particular characteristic to limit excessive water loss, the leaves are scleromorphic. One to three spherical, brownish-red, and extremely tough seeds are contained in globose fruits, which have a diameter of around one centimeter [3].



Fig. 1: Crude form of *Dracaena cinnabari*



Fig. 2: Powder form of *Dracaena cinnabari*

Phytochemical Constituents

Phytochemical studies of *D. cinnabari* have resulted in the isolation of red resin [6], benzoic acid, and cinnamic acid [6,7,8], flavonoids [9,10], bioflavonoids [11,12], triflavonoids [13] and triterpenoids [14].

Traditional uses

Dragon's blood is one of the recognized folk remedies used throughout the world. Early Greeks, Romans, and Arabs utilized dragon's blood for its therapeutic benefits. The Dragon's blood (*Dracaena*) was used as a sort of natural remedy by the people of Moomy City on Socotra Island. It was used as a coagulant, an antiviral for respiratory and stomach viruses, an antidiarrheal, a treatment for internal ulcers of the mouth, throat, intestines, and stomach, and to treat eczema and diarrhoea as well as dysentery disorders. Dioscorides and other early Greek authors studied its medical applications. Dragon's blood (*Dracaena*) is used in Yemeni folk medicine to treat external ulcers, bleeding, and diarrhoea [15].

Pharmacological actions

Antioxidant Activity

The total resin solution dissolved in methanol shown the highest antioxidant activity when compared to the other polar and non-polar extracts mentioned in the study by Al-Fatimi M [4].

Hemostasis and Wound Healing.

The hemostatic activity of *D. cinnabari* resin has been demonstrated to be effective against both external and internal injuries [4]. In rats, an ethanolic extract of dragon's blood resin demonstrated antithrombotic and anticoagulant activity [16]. According to a clinical trial study, dragon's blood is an effective, widely available, cost-effective, and safe healing medication [17].

Antidiabetic and Hypolipidemic Effects.

The resin of *D. cinnabari* has been proven to have strong antidiabetic efficacy against MCF-7 cell lines in vitro using conventional glucose uptake techniques [1]. Similar to this, ethanolic extract of *D. cinnabari* resin at two doses (100 mg and 300 mg kg) led to a considerable drop in FBG levels and a recovery in the destruction of pancreatic cells compared to the control group in alloxan-induced diabetic rats. Additionally, in comparison to control groups, the extract at the same doses significantly reduced triglycerides, total cholesterol, low-density lipoprotein, very low-density lipoprotein, and atherogenic index [18].

Antimicrobial Effects.

The *D. cinnabari* resin extracts have demonstrated antibacterial action against numerous bacterial species [19, 20]. Using an agar disc diffusion method, it has been discovered that the dichloromethane extract of *D. cinnabari* resin has a good inhibitory effect against a variety of food-borne infections. The maximum antibacterial potential was found in the dichloromethane extract

of dragon's blood resin against *B. subtilis*, *S. aureus*, *M. luteus*, *S. flexneri*, *P. mirabilis*, *E. aerogenes*, *E. coli*, *P. aeruginosa*, *C. albicans*, and *A. flavus* [21]. Additionally, the antimicrobial effects of several solvent extracts of *D. cinnabari* resin on Gram-positive bacteria, Gram-negative bacteria, and fungi showed that these microorganisms have varying susceptibility to the various extracts [22,23]. Similarly, the aqueous and ethanolic extracts of *D. cinnabari* significantly inhibited the activity of *E. coli*, *P. vulgaris*, *P. aeruginosa*, *K. pneumoniae*, and *S. saprophyticus* [24]. The methanolic extract of *D. cinnabari* also showed antiviral effects against *influenza virus A* and *herpes simplex virus* [25]. When compared to the antifungal reference nystatin, the methanolic solution of the crude resin demonstrated the best antifungal activity (20-30mm) against *A. fumigatus*, *M. gypseum*, and *T. mentagrophytes*, followed by less polar dichloromethane and ethyl acetate extracts (18 to 20 mm) [4].

Anti-Inflammatory and Analgesic Effects.

An ethanolic extract of *D. cinnabari* resin demonstrated anti-inflammatory and analgesic activity in animal models, with 50 and 150 mg/kg oral doses significantly reducing inflammation [26]. Methanolic extract of *D. cinnabari* resin and its bioactive component inhibited nitrite, tumour necrosis factor- α , and interleukin-6 production in lipopolysaccharide-stimulated mouse macrophage cell line RAW 264.7. Reduced oedema in rats also validated the anti-inflammatory potential of the treatments tested. These findings indicate that *D. cinnabari* resin has significant anti-inflammatory properties at certain doses [27]. It was discovered that, depending on the dose, Dragon's blood resin could reduce TTX-S voltage-gated sodium currents, which could explain their analgesic effects [28].

Anticancer, Antitumor, and Chemopreventive Potential.

D. cinnabari methanolic extracts had the highest anticancer activity against several tumour lines tested [19]. The resin of *D. cinnabari* was tested on human oral squamous cell carcinoma and found to have the potential to be developed as an anticancer agent [29]. In vitro, ether and ethyl acetate extracts of *D. cinnabari* resin inhibited MCF-7 breast cancer cells by 50% at 100 g/mL doses [1]. A recent in vivo study found that a methanolic extract of *D. cinnabari* resin reduced the incidence of oral squamous cell carcinoma in mice when compared to an untreated induced cancer group [30]. Methanolic extracts of *D. cinnabari* Balf. f. inhibited cell proliferation, reduced cell migration, caused cell cycle arrest, and induced apoptosis in human H103 cells [31].

Ethnopharmacology of Dammul Akhwain (*D. cinnabari* Balf.f.) in Unani System of Medicine

Dammul Akhwain is a resin that breaks easily and its powder is very dark red. There are controversies in its identification with ancient Unani physicians. The Unani scholar Mir Bahauddin says it is the Usara of *Abu Khalsa*, and the wood of this plant turns red in summer. One renowned author said that it is the gum of Baqam (*Caesalpinia sappan* L.), which is called patang in Hindi, but it is not true because it is procured from the area where Patang is not available. Some said it is the Usara of *Qisaul Himar* (*Luffa echinate* Roxb.) which is called bindaal in Hindi. *Qarshi* said it is a red dried Usāra (extract). Others said it is a gum of a plant that resembles the plant of Hayyul

Alam (*Vinca rosea* L.) but bigger than it, whose branches are not straight, easily breakable, the bark is thin, leaves are thin, round, and pinnate flowers are orange, seeds are black when cut on branches a red colour liquid oozes out which solidifies quickly. Some said that that DA procured from Socotra island is a dried extract of a red herb called *Fahdam*. It is found in India, Africa, Khorasan, and Armenia but DA from the Island of Socotra is of the best quality [32]. DC is the gum of a tree, red sometimes blackish red, and tastes bitter and disagreeable [33]. The best quality of DA is clean, reddish gum which does not contain any wood materials. In recent eras due to the lack of availability of DA people adulterate 'Kundur surkh' (*Boswellia serrata* Roxb.) as an adulterant with it. The efficacy of dragon's blood resin for a longer time as it has long shelf life [33].

Selected Vernacular Names

Dammul Akhwain, Fatir-ul Dam, Damul Teneen, Damus Shabaan (Arabic), Khoon siaoshan (Persian), Qatiruddam, Ki-lin-keep, Lung-sin-hiang (Chines), Qantaa & Abdaa (Rumi), Darwademara (Suryani), [32,33], Kainu (Latin) [32,33,34], Hera dokhi, Rang barat, Nalornagot, and Jaida Rumi (Hindi) [32,35], Kino, Dragon's blood (English) [32], Rand birat (Hindi) [36], Damul Taneen (Arabic), Sobaan (Hindi) [37].

Mizāj (Temperament/constitution)

According to Unani physicians the temperament of the DC is Barid Yabis (cold & dry) at 3⁰; Barid (cold) at 3⁰ & Yabis (dry) at 2⁰; or Barid (cold) at 1⁰ & Yabis (dry) at 2⁰, [32]. Barid (cold) & Yabis (dry) at 3⁰ [33,35, 39, 42], Barid (cold) & Yabis (dry) at 2⁰ [36,37], Barid (cold) at 3⁰ & Yabis (dry) at 2⁰ [38].

Afa'al (Therapeutic Actions)

The resin of the dragon's blood has been used by Unani scholars for its different actions i.e., *Habis-i-Dam* (hemostyptic) [32,33,34,35,39,40,42], *Muqawwi-i-Mi'da* (stomachic) [32,37,38], *Muqawwi al-'Ayn* (eye tonic) [38], *Dafi'-i-Zahīr wa Ishal* (cure dysentery) [32,34,36,39]. *Mudammil-i-Qurūh al-Maq'ad* (cicatrizant for anal ulcers). *Mudammil-i-Sahj wa Shaaq al-Maq'ad* (cicatrizant for abrasion and incised anal wound), *Nāfi'-i-Du'fal-Basar* (improve impaired vision like asthenopia or amblyopia), *Nāfi'-i-Qarha-i-Chashm* (heal eye ulcer) [35], *Dāfi'-i-Nazf al-Dam* (anti-hemorrhage), [36,37], *Nāfi'-i-Shiqaqal-Maq'ad* (tearing of annal tissues) in the form of Tila [37] *Qābid*, (astringent) [6,33,41,42,43], *Muḥallil* (resolvent) [33,41], *Muharrik* (a mild stimulant) [6], *Mujaffif* (desiccant) [42,43]

Therapeutic uses

It stops internal bleeding when taken internally, and heals wounds made by sharp objects like a sword or knife. Stop loose stool, useful in abrasion of intestines, and act like a tonic for the stomach. The fine powder when sprinkled over the bleeding wound stops the bleeding and helps

in healing. It is used to treat abrasion and wound at the anal part [32, 42]. As external if used in powder form (surma) in the eye it improves eyesight. Its powder when used as tooth powder strengthens teeth and gums and cleans them [32,34]. It is a special drug for *sil* (pthasis), *diq* (tuberculosis), and *Khanāzīr* (lymphadenopathy) [34]. It is used to treat the *Quruh* (ulcers) [38,43], *Shaqaq al-Maq'ad* (crack in the anus), and *Du'fal-Mi'da* (weakness of stomach). In a dose of 1.5 gm with *Bayda-i-Nim Birisht* (half-boiled egg) it is useful in *Sahj* (abrasion of the innermost layer of the intestine) and *Habis-i-Batn* (hemostyptic for abdominal bleedings). It is useful in *Nazf al-Dam* (hemorrhage/bleeding), and *Du'f-i-Basarat* (weakness of eyesight) when used as *Surma* (microfine powder) locally in the eyes [38, 41].

It's given in diarrhea, dysentery, bleeding from piles, and internal hemorrhage as haematuria, or hemoptysis [6]. It is used in *Zahīr* (dysentery) [39, 42], *Nafth al-Dam* (hemoptysis) [39,43], bleeding and dusting in the fresh wound [39], and *Ru'āf* (epistaxis) [43], *Kasrat-i haiz* (menorrhagia), bleeding piles [42]. The root yields a gum resin, used in gargling water as a stimulant, astringent, and in toothpaste. Root used in rheumatism. Leaves as used carminative [40].

Mudir Atharāt (Adverse Effects)

It has an adverse effect on the kidney [32,35], lungs, and spleen [32]

Muslih (Corrective)

To protect the kidney, Kateera (gum of *Cochlospermum religiosum* L.) may be used [32,34,35] and for the lungs, Kateera (gum of *Cochlospermum religiosum* L.) or Babool ka gond (the gum of *Acacia Arabica* Willd.) may be used [32,34]. In the case of spleen pudina (*Menthe arvensis* L.) may be used [32]

Badal (alternative)

Kahu (*Lactuca serriola* L.), Usara Kahu (extract of *Lactuca serriola* L.) [32,34], Aqaqiya (*Acacia Arabica* Willd.), Sendhi (*Phoenix sylvestris* ROXB.) [32,34,35]

Miqdar-i Khurak (Dose)

1-4 gm [32, 35], 2 - 4.5 gm [34]

Compound formulations of Dammul Akhwain (*Dracaena cinnabari* Balf.f.)

The *Dracaena cinnabari* is used as an important ingredient in the following compound formulations such as Sasuf-e Istehaza (powder form), Qurs-e Kaknaj (tablet), Qurs-e Bawaseer (tablet), and Majoon- Teewaj (semisolid formulation) [39].

Conclusion

The fundamentals, diagnosis, and treatment procedures of the Unani system are based on scientific principles and holistic concepts of health and healing. The *Mizāj* (temperament) has great importance in diagnosis and treatment and played a vital role in the selection of suitable diet or drugs for the effective management of a particular disease. Drugs having *Mizāj* Harr (hot

temperament) have been used to treat diseases caused by *Mizāj* Barid or cold temperament diseases and vice versa. Dammul Akhwain (*Dracaena cinnabari*) is an important drug of the Unani system of medicine and has many important pharmacological actions i.e., *Habis-i-Dam* (hemostyptic), *Muqawwi-i-Mi'da* (stomachic), *Dafi'-i- Zahīr wa Ishal* (cure dysentery and purgation), *Mudammil-i-Qurūh al-Maq'ad* (cicatrizant for anal ulcers), *Qābid*, (astringent), *Muḥallil* (resolvent), *Mujaffif* (desiccant) and *Muharrrik* (a mild stimulant).

It is commonly used to maintain health and to treat many diseases like *Quruh* (ulcers), *Shaaq al-Maq'ad* (crack in the anus), and *Du'f al-Mi'da* (weakness of stomach), *Zahīr* (dysentery), *Nafth al-Dam* (hemoptysis), *Ru'āf* (epistaxis), *Kasrat-i haiz* (menorrhagia), *Sil* (pthasis), *Diq* (tuberculosis), *Khanāzīr* (lymphadenopathy), and *Du'f-i-Basarat* (weakness of eyesight). Since the resin is used in its natural state, the human body can readily ingest, digest, and metabolize it without causing any negative effects on the body's various organs. Since Dammul Akhwain has been used for generations to achieve the aforementioned goals successfully and without a hitch, this emphasizes the effectiveness of natural medicines in general and Dammul Akhwain in particular. The therapeutic benefits of Dammul Akhwain, which are detailed in this review, have demonstrated that a wide range of disorders can be effectively and safely managed with the use of natural medicines. An efficient and secure substitute for conventional therapy can be found in the use of natural medications and the Unani diet.

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