

# Potential role of Unani medicinal plants in management of Kalaf (Chloasma): A review

Zareena Aquil, Mohd Khalid, Qamar Uddin, Kazmi MA, Waseem Ahmad

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Kalaf (chloasma) is a brown macular hyper-pigmentation with well-defined scalloped symmetrical margins on cheeks, nose, forehead, and chin. The peak incidence is reported in the patients of 30-50 years of age. According to Unani system of medicine, Ghaleez Saudavi Bukharat (thick melancholic vapours) ascend towards the face and gets trapped beneath the skin; the dominance of abnormal black bile (Galba-e-Sauda) in the skin and blood are

also involved in the disease pathogenesis. Vast body of literature is available in Unani Medicine for the treatment of melasma. Ancient Unani physicians such as Abu-al-Qasim Zohravi, Zakariya Razi, Ibn Sina, Mohammad bin Tabri, and Ajmal Khan have described medicinal plants used for its treatment. The present review paper strives to explain the potential role of Unani medicinal plants used in the treatment of Kalaf.

**Key Words:** Kalaf; Melasma; Chloasma; Unani medicine

The term "Chloasma" has been taken from the word "chloazian" which means "green" and "melasma" from the Greek word "melas" meaning black [1]. Because the pigmentation is never green in look therefore melasm is the preferred term. It is basically a disorder of pigment metabolism which is exteriorly characterised by sharply demarcated, blotchy, and brown macular lesion usually symmetrical in distribution seen mostly on cheeks and forehead [2]. Although, melasma can affect any group of people but mostly seen in Asian and Hispanic females [2]. In Unani system of medicine, Kalaf is clinically like chloasma caused by charred melancholic blood parts that ooze out of capillaries and get accumulated beneath the skin [2].

## EPIDEMIOLOGY

Melasma physiologically occurs in pregnant women that usually resolve spontaneously after delivery, but some traces may persist [2]. Similarly, about 10-20% of women taking oral contraceptive pills may develop melasma that may be a marker for other causes of elevated oestrogen level. Although, 90% of the patients are women, and the clinical-histological characteristics are same in both sexes [3]. According to Unani medicine, prolonged exposure to sun and heat, unhygienic conditions, consumption of saqeel, hot and raddi aghdia, consumption of alcohol and post-menopausal periods of women are some important factors which predispose to development of melasma [4].

## ETIOPATHOGENESIS

The exact cause of melasma is unknown; even though, various different factors have been implicated in its etio-pathogenesis including genetic influences, exposure to UV radiation, pregnancy, oestrogen and progesterone therapies, thyroid dysfunction, cosmetics, phototoxic and anti-seizure drugs. Three main factors in the development of Melasma are female hormones, sun light exposure, and genetic predisposition [2].

According to Unani system of medicine, there are several causative factors implicated in its causation including prolonged exposure to excess abnormal external heat; Dam-e-Muharraq (charred blood), Sauda-e-Muharraq (charred melancholic blood), Ghiza-e-Kaseef (indigestible food), constant local pressure, pregnancy, liver diseases i.e. Du'f al-Kabid (liver atony) and Sughar al-Kabid [5].

## CLASSIFICATION

Three important types of chloasma have been described in modern pathology i.e., epidermal, dermal and mixed [6]. In Unani Medicine, following types have been mentioned attributed to their causative factors [7,5].

1. Kalaf-e-Rahmi: It occurs in pregnant women and the common sites of the lesion are forehead, face, and chest.
2. Kalaf-e-Zarbi: It results due to constant pressure over any part of the body leaving a hyper-pigmented lesion.

3. Kalaf-e-Kabidi: It occurs as a manifestation of liver diseases and the common distribution is face, forehead, and hands.

4. Kalaf-e-Hurri: It occurs due to prolonged exposure to sun rays and the lesions are distributed on the exposed body parts.

## TREATMENT

Conventional treatment includes mercury-containing compounds, hydroquinone, corticosterone (steroid hormone of corticosteroid), tretinoin, azelaic acid, laser treatment, and chemical peels. The efficacy of these treatment modalities is good and rapid, but some serious side effects are also associated with it such as erythema, skin peeling, and burning and stinging sensation [8].

In Unani system of medicine, various treatment approaches have been mentioned to treat melasma such as drug therapy; dietotherapy, and Ilaj-bit-Tadbeer. The commonly used medicinal plants in Kalaf exhibit different pharmacological properties such as Jaali (detergent), Qashir (scaling), stripper, lavage, Ghassal (irrigator), Mubassir (vesicant), Muhammir (rubefacient), Raade-Mawaad (divergent) and Mughazzi (nutrient). Some of the important single drugs with their reported mechanisms of actions are delineated in Table 1.

### 1. Tukhm-e-Turb (*Rhaphanus sativum*)

It contains vitamin C, pelargonidin-3-sophoroside-5-glucoside and caffeic acid. These constituents possess "antioxidative" activity [7].

It is widely described in Unani literature as an effective and potent medicine in treatment of chloasma either singly or with any appropriate drug. It possesses Jaali (detergent) action that helps lighten the hyper-pigmentation [5,9,10,11].

### 2. Maghz-e-BadamTalkh (*Prunus amygdalus*)

It is a rich source of vitamins, minerals, fatty acids, carbohydrate, proteins, and antioxidants. Due to high protein content, it has the capacity to lighten the melasma lesions. Almonds also contain vitamin E that not only improves the complexion, but also nourishes the skin; thereby nourishing it i.e., it possesses Mughazzi (nutritive) property; hence, it has been vastly prescribed in treatment of chloasma [9,10].

### 3. Sandal Sufaid (*Santalum album*)

It is very effective in treating chloasma and can be used as a mufrad or with other compounds [5,12]. It has been found that  $\alpha$ -santalol present in sandalwood inhibit tyrosinase, an essential enzyme for the synthesis of pigment melanin. This property helps in limiting the abnormal pigmentation

Central Research Institute of Unani Medicine, Hyderabad, Telangana State, India

Correspondence: Zareena Aquil, Central Research Institute of Unani Medicine, Hyderabad, Telangana State, India. Telephone 55(98)981230696, e-mail zarzar.aquil@gmail.com

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**TABLE 1**  
**Some important Unani medicinal plants used in Melasma.**

Scientific Name	Unani Name	Chemical Constituents	Mechanism of Actions	References
<i>Glycyrrhiza glabra</i>	<i>Ustukhudoos</i>	Liquorice	Dispersing the melanin Inhibition of melanin biosynthesis Anti-inflammatory property	[6, 18]
<i>Casia fistula</i>	<i>Amaltas</i>		Tyrosinase inhibition	[19,20]
<i>Vitis vinifera</i>	<i>Maweez</i>	Proanthocyanidin	Antioxidant	[6,21,22]
<i>Aloe barbadensis</i>	<i>Elva</i>	Aleosin	Tyrosinase inhibition	[6,22-24]
<i>Gentiana lutea</i>	<i>Juntiana</i>	Gentisic acid	Inhibit melanogenesis	[21,28,30]
		Safranal		
		Zeaxanthin	Antioxidant	
<i>Crocus sativus</i>	<i>Zafran</i>	$\alpha$ $\beta$ carotens Cyanidins Kaempferol	Tyrosinase inhibitor	[6,24]
<i>Daucus carota</i>	<i>Gajar</i>	Hydroxycoumarins	Tyrosinase inhibition	[6]
<i>Santalum album</i>	<i>Sandal</i>	$\alpha$ santalol	Tyrosinase inhibition	[24]
<i>Rubia cordifolia</i>	<i>Fawwah</i>	Manjishthin, Purpurine Phenylcoumarins	Tyrosinase inhibition	[24]
<i>Mesuaferia</i>	<i>Narmushk</i>	Xenithones Triterpenoides	Antioxidant	[24]
<i>Saussurea lappa</i>	<i>Qust</i>	Methanolic extract	Tyrosinase inhibition	[24]
<i>Berberis aristata</i>	<i>Zarishk</i>	Methanolic extract	Tyrosinase inhibition	[24]
<i>Curcuma longa</i>	<i>Haldi</i>	Turmeric rhizome	Tyrosinase inhibition	[24]
<i>C. zeylanicum</i>	<i>Darchini</i>	Essential oils	Tyrosinase inhibition	[24]
<i>Acasia catechu</i>	<i>Kath</i>	Catechins	Antioxidant Tyrosinase inhibition	[24]
<i>Embllica officinalis</i>	<i>Amla</i>	Emblicanin $\alpha$ & $\beta$ Punigluconin Pedunculagin	Antioxidant Tyrosinase inhibition	[24]
<i>Terminalia chebula</i>	<i>Halela</i>	Methanolicaqueous extract	Inhibit melanogenesis	[24]
<i>Azadirachta indica</i>	<i>Neem</i>	Methanolic extract of bark	Antioxidant Tyrosinase inhibition	[24]
<i>Zingiber officinalis</i>	<i>Zanjabeel</i>	6 gingerol	Decrease the amount of melanin Tyrosinase inhibition	[26, 24]
<i>Carica papaya</i>	<i>Papita</i>	Papain	Tyrosinase inhibition	[27]

associated with aging and exposure [12,13]. It contains raade-mawaad (divergent) and blood purifier activities [14]. The raade-mawaad (divergent) property of sandal safaid helps in diverting the fasid mawaad of chloasma from the site of lesion and hence helps in reducing the condition.

#### 4. Aab-e-Lemun (*Citrus lemon*)

It has high amount of vitamin C, citric acid, polyphenols, trapenes and tannins that help reduce and removing the melasma pigmentation [15]. The citric acid of lemon acts as a jaali (detergent) and helps in peeling off the outer skin layer. It is very helpful in treating chloasma [5,11,16].

#### 5. Gule-Surkh (*Rosa damascena*)

Rose contains high amount of vitamin C, a powerful antioxidant and phenolic compounds that prevent and treat the chloasma [17]. The rose water can help to prevent sunburn. It is described in various books of Unani as a very effective drug for chloasma as well as in other diseases [5,9].

#### 6. Arad-e-Baqila (*Vicia feba*)

It contains proteins, magnesium, potassium, calcium, and vitamin C [18-28]. It has Jlaali (detergent) action to treat chloasma [5,9,11].

#### 7. Kaf-e-Dariya (Cuttlefish bone)

It contains chitin included in many cosmetic preparations. It exhibits Qashir property, hence, used in Kalaf [5,11].

#### 8. Husn-e-Yusuf (*Laminaria hyperborea*)

It is a potent hydrator, conditioner, and Mughazzi (nutritive) drug for skin. It also detoxifies skin through minerals and vitamins present in it. It is very useful in treatment of chloasma and has been described in various texts of Unani Medicine [5,11].

#### 9. Khayar (*Cucumis sativus*)

The antioxidants and silica are abundantly present in cucumber that helps in

gradual lightening of dark spot of chloasma [18-29].

#### 10. Maweez (*Vitis vinifera*)

According to Unani literature, Maweez also has Musaffi (blood purifier)11 and Jaali activities that help lighten the dark spots of Kalaf [16].

#### 11. Yasmeen (*Jasminum officinalis*)

The cicatrizant and collagen enhancing properties of Yasmeen make it an exceptional remedy for treating Kalaf. Applying paste of Yasmeen on chloasma can permanently cure the disease [5,11].

#### 12. A'sl (Honey)

Honey is rich in antioxidants, enzymes and other nutrients that nourish, cleanse, and hydrate the skin. It possesses Jaali property hence; it is very effective in treatment of Kalaf. It can be used either as a single drug or with other appropriate medicines [5,11].

#### 13. Zafran (*Crocus sativa*)

Zafran is a marvelous drug of Unani Medicine, and has multiple beneficial roles in various diseases. Paste of Zafran and Kaddu Kuhna (old bottle gourd) is applied on chloasma [11]. It also contains kaempferol which is a natural flavanol responsible for strong anti-oxidant property [30-33].

### FUTURE RESEARCH PROSPECTS

Melasma is a complex disorder and various factors are involved in its pathogenesis, identification of which will help us in developing better, more efficacious treatment options with less side effects, ensuring longer periods of remission. There are various treatment modalities for melasma mentioned in Unani texts. But the research trend towards melasma has been very dismal, even though being a common cosmetic problem. Very few clinical trials have been conducted that have various limitations including small sample size, study design, and ethical concerns (Table 2).

Hence, more randomized controlled trials are required to validate as well as evaluate their efficacy in melasma. Treatments consisting of fewer ingredients i.e., two to three drugs; may be easily evaluated with robust study designs. There is also needed to clarify the role of regimental procedures such as purgation and leech therapy as combination therapy to provide optimum results and prevent the relapses. Few future steps that may be considered

while conducting trials on melasma are depicted diagrammatically (Figures 1 and 2).

Unani medicine has immense potential in curing melasma, but proper protocol development with robust study design including Black Box Design as the same is empowered with application of whole treatment regimes described in the classical texts. The basic problem faced in conducting research

**TABLE 2**  
**Research Studies Conducted on Melasma in Unani medicine**  
**(Abbreviation: MASI; Melasma Area and Severity Index)**

S. No.	Title of study	Study Design	Interventions	Outcomes	References
1	Comparative clinical evaluation of Unani formulation in the treatment of Melasma	Randomized, Parallel Group Comparative Clinical Trial	Cuttlefish bone powder locally and <i>Afteemoon</i> powder orally	The outcome was assessed using MASI (p = 0.8049; Skin colour shades assessment (p<0.001); Patient's Global Assessment (p >0.05, and DLQI (p>0.05). Overall, the effect was insignificant. Test group Excellent-19% Good-38% Satisfactory 33.5% Slow -9.5%	[2]
2	Randomized clinical trial of Unani formulations in Chloasma	Randomized single blind study	Coded drug, MN orally XM locally	Placebo group- No response-61.9% Satisfactory response- 9.5% Slow response- 28.6%	[30]
3	Therapeutic evaluation of Unani herbal medicine for topical application	Single blind randomized standard control clinical study	Test group: <i>Tukhm-e-Turb</i> , <i>Tukhm-e-Karafs</i> , and <i>Sirka</i> ; Control group: Azelaic Acid Cream 10%	In MASI score T (total)-strongly significant improvement in test group-(0.001) And strongly significant changes in control group (0.007%)	[31]

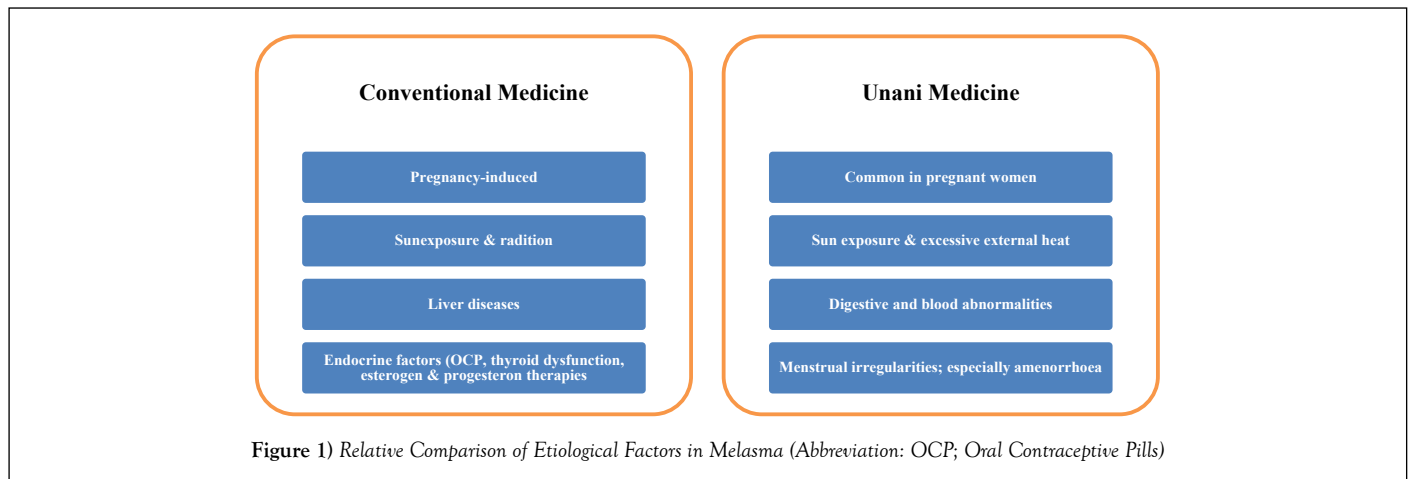


Figure 1) Relative Comparison of Etiological Factors in Melasma (Abbreviation: OCP; Oral Contraceptive Pills)

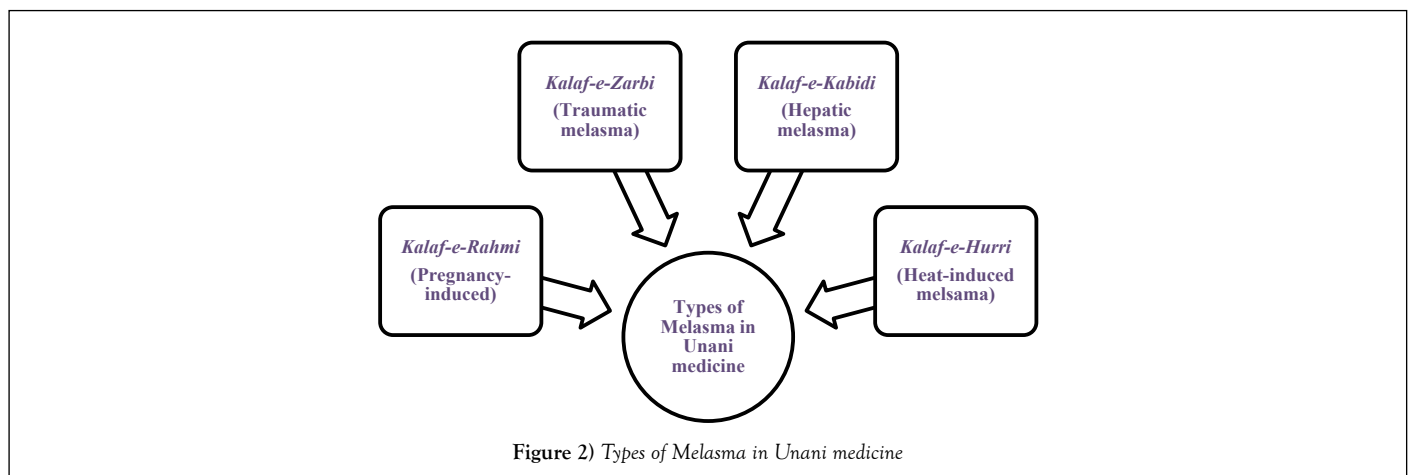


Figure 2) Types of Melasma in Unani medicine

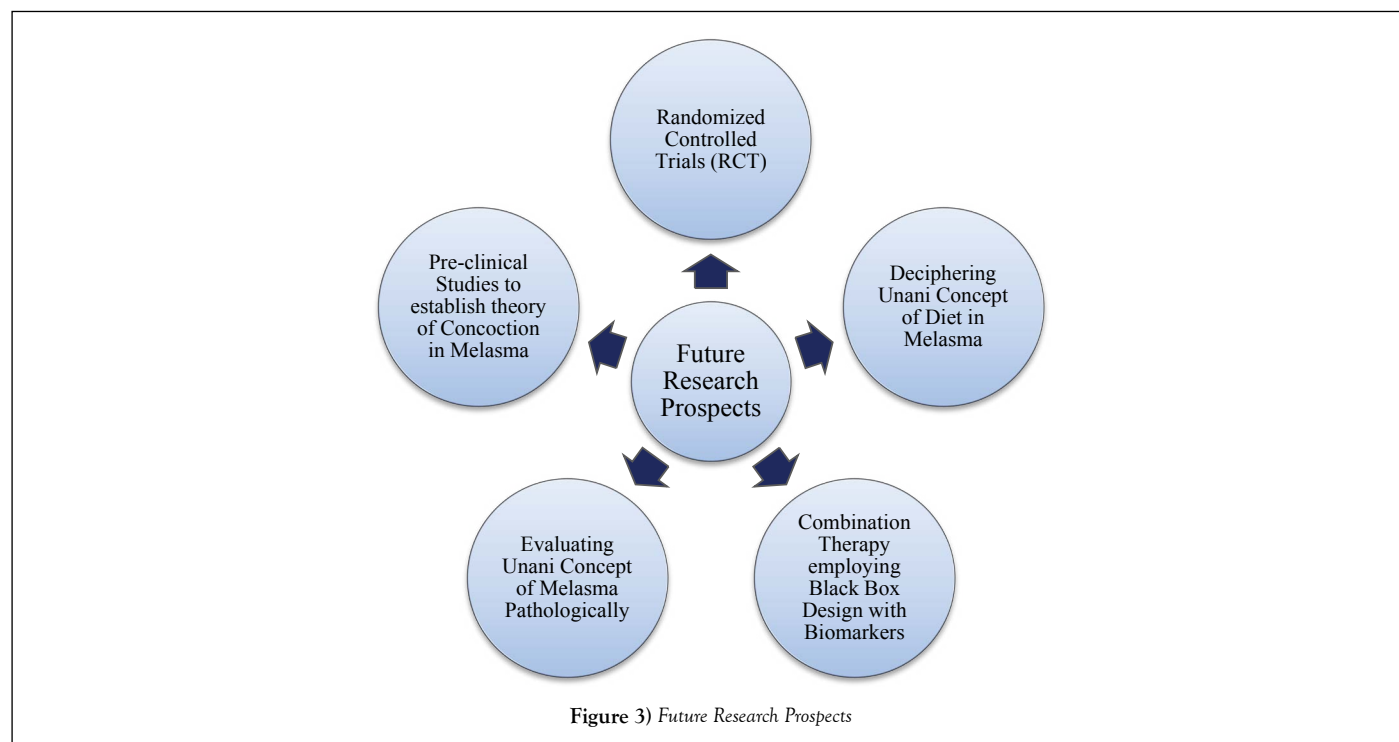


Figure 3) Future Research Prospects

in Unani medicine like other traditional medical systems is evaluation of multi-drug regime as compared to conventional research framework, and while adopting this, the core concept of Unani medicine in melasma RCTs (Randomised Controlled Trials) is not fully adhered to. Hence, research organizations including WHO came up with black box design to implement the treatment regimes in phasic manner, but its acceptability within the scientific community of conventional medicine must be established. The same may be potentiated with employing newer measures like biomarkers to define the role of therapeutic measures (Figures 1-3).

### CONCLUSION

Kalaf (chloasma) has been vastly discussed in Unani System of Medicine including its types, causes and treatment. The treatment modalities in Unani system of medicine are quite effective with no/ or minimal adverse effects. In addition to this, the Unani treatment is cost effective, economical and by far accessible.

Therefore, the efficacy and outcomes of different treatment modalities described in text should further be evaluated and validated by randomized clinical trials.

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