

INTERNATIONAL JOURNAL OF UNANI AND INTEGRATIVE MEDICINE



E-ISSN: 2616-4558
P-ISSN: 2616-454X
www.unanijournal.com
IJUIM 2025; 9(3): xx-xx
Impact Factor (RJIF): 6.59
Peer Reviewed Journal
Received: 23-08-2025
Accepted: 24-09-2025

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A comprehensive review of *Sawdā'* (Black Bile): Classical Unani perspectives and modern correlations

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DOI: <https://doi.org/10.33545/2616454X.2025.v9.i3b.384>

Abstract

According to Unani medicine, human health is maintained by the equilibrium of the four *Akhlāt* (Humours): *Dam* (Sanguine), *Balgham* (Phlegm), *Şafrā'* (Yellow bile) and *Sawdā'* (Black bile). Among them, *Sawdā'* (Black bile), is considered to be lowest in importance because of having opposite *Kayfiyat* (Quality) to that of *Dam* (Sanguine/Blood). Even though it is lower in hierarchy, it plays a crucial role in human physiology and pathology. *Sawdā'* is primarily produced in the liver and transported to the spleen, where it participates in thickening of blood, nourishment of *Bārid Yābis A'ḍā'* (Cold and Dry Organs), and stimulation of appetite. *Sawdā'*, if imbalanced either quantitatively or qualitatively, is associated with a number of diseases like melena, melanoma, and melancholia. Modern parallels of *Sawdā'* include melanin, black iron pigments, and altered hemoglobin, which validate classical Unani descriptions. This review aims to approach classical descriptions of *Khilṭ Sawdā'* along with contemporary approach of understanding its clinical relevance.

Keywords: Unani Medicine; Humors; *Sawdā'*; Melanins; Hemoglobins; Melancholia

Introduction

The concept of *Akhlāt* (Humours) has a central place in Unani Tibb.^[1] The term *Khilṭ* (Humour) refers to the substance which is in mixture form.^[2] It is one of the seven factors of existence (*Umūr Ṭabī'īyya*). *Khilṭ* is a liquid substance made up as a result of *Istihāla Awwal* (First Metabolism) of food in *Kabid* (Liver).^[3] According to *Masīhī*, *Khilṭ* is a liquid substance which is enclosed in the vessels and cavity of the body which prevent it from leaking outside.^[4]

The human body is buildup of *Akhlāt Arba'a* (Four Humours) ^[5] According to Unani medicine, human health is maintained by the equilibrium of the four *Akhlāt* (Humours): *Dam* (Sanguine), *Balgham* (Phlegm), *Şafrā'* (Yellow bile) and *Sawdā'* (Black bile). Among them, *Sawdā'* (Black bile).

Among them, *Sawdā'*, also known as Black bile, ranked fourth in importance because of having opposite *Kayfiyat* (Quality) to that of *Dam* (Sanguine/Blood). Although lowest in importance, it is far from insignificant. In Unani literature, almost all philosophers have described Black bile in their treatises. Among them the *Hippocratic* "On the Nature of Man" is the very first treatise to describe about Black bile. In this treatise a substance named Black bile, which is associated with autumn and a particular stage in person's life i.e. old age.^[6] *Ibn Sīnā*, *Qarshī* and *Abū Sahl Masīhī*, have also emphasized its dualistic nature in health and disease.

Sawdā' is regarded as a sediment (*Tilchhat*) of normal sanguine, produced in the liver and separated from it through a branch of the *Bāb al-Kabid* (Porta hepatis) and conveyed to the spleen. It plays important role in thickening of the blood, nourishment of *Bārid Yābis A'ḍā'* (Cold and Dry Organs), and stimulation of appetite by being fallen on *Fam al-Mi'da* (Cardiac end of stomach). Modern biomedical studies suggest the parallels to the Unani concept of *Sawdā'*. Substances such as melanin, black iron pigments and altered quality of hemoglobin possess the characteristics resembling with *Sawdā'* which can pave an important path in bridging traditional knowledge with contemporary scientific understanding.

Sawdā' has a significant physiological importance as well as pathological impression inspite of being ranked as least among all humors. This review aims to approach classical descriptions of *Khilṭ Sawdā'* including its physiological roles, pathological aspects, dietary effects along with contemporary approach of understanding its clinical relevance.

Materials and Methods

This study is a systematic literature review focusing on Classical Unani texts, including *Al-Qānūn fi'l Tibb*, *Kāmil al-Ṣanā'a*, *Kitāb al-Manṣūrī*, *Kitāb al-Mi'a fi'l Tibb*, *Kulliyāt Nafeesi*, *Kulliyāt Qānūn*, *Kitāb al-Hāwī fi'l Tibb* and *Kulliyāt Asri*. Relevant publications from library resources, CCRUM publications, and indexed scientific databases were identified. Modern literature was reviewed to identify the parallels to the Unani concept of *Sawdā'* and interpret traditional Unani concepts in light of current understanding.

Description of *Khilṭ Sawdā'* (Black Bile)

In Unani terminology, all the black-colored fluid of the body are called *Sawdā'*.^[7] Among all the *Akhlāt* (Humours), the rank of *Sawdā'* is the fourth, i.e., the lowest, because both of its *Kayfiyat* (Quality) are opposite to those of *Dam* (Sanguine/Blood). Despite being of the lowest rank, it nevertheless possesses its own merits and significance.^[8] *Sawdā'* is regarded as a sediment (*Tilchhat*) of blood, produced in the liver and separated from it through a branch of the *Bāb al-Kabid* (Porta hepatis) and conveyed to the spleen.^[9]

Properties of *Khilṭ Sawdā'*

- **Temperament:** *Mizāj* (Temperament) of *Sawdā'* is *Bārid Yābis*. But some of the other types are *Hārr* (Hot) in nature.^[7] *Qarshī* described it as *Bārid Yābis* whereas *Abū Sahl Masīhī* called it *Hārr*. *Ibn Sīnā* did not mention its *Mizāj* (Temperament). Evidence of having *Bārid Yābis Mizāj* of *Sawdā'* is that it is produced by taking *Bārid Yābis* diet and during *Bārid Yābis* season and in *Bārid Yābis* age.^[8]
- **Taste:** Initially, its taste is sour, but after remaining in the spleen, becomes more acidic.^[9] *Ibn Sīnā* described its taste as intermediate between sweet and astringent.^[3]
- **Consistency:** It is dense and thick in nature.^[10] After forming in the liver, it divides into 2 forms, one which is more thick, goes towards spleen, and the other, which is comparatively thinner, flows along with blood.^[10,11]

Physiological Role of *Sawdā'*

1. **Thickening of blood:** The first role of *Sawdā'* is that it thickens the blood. Due to this viscosity, the blood can remain at one place long enough to undergo digestion and transformation, thereby facilitating its utilization in the nourishment of tissues and organs. The viscosity and density cause the blood components to adhere and coagulate, making clot formation more feasible. Furthermore, it also contributes to the development of fibrous, thread-like structures within the blood.^[8]
2. **Nourishment of tissues and organs:** The second role is that it participates in the nourishment of those organs which are *Bārid Yābis* (Cold and Dry) in *Mizāj* and are more dense and solid, such as bones.^[8]
3. **Stimulation of appetite:** The third role is that some portion of *Sawdā'* falls on the *Fam al-Mi'da* (Cardiac end of stomach), which stimulates hunger and creates the desire for food.^[12] Since *Fam al-Mi'da* is responsible for demanding food on behalf of all the organs, it is necessary that the sensation of hunger there should be very strong, so that man is compelled to seek nourishment. For this purpose, it is required that when the stomach is empty, something should fall on it

which, by its sharpness, produces irritation in the *Fam al-Mi'da* and also strengthens it. *Sawdā'* is such a substance- it produces a kind of irritation (tickling sensation) in the *Fam al-Mi'da* by its sourness and strengthens it by its astringency.^[8]

Types of *Sawdā'*

1. ***Sawdā' Ṭabī'ī*:** *Sawdā' Ṭabī'ī* represents the residue or sediment (*tilchhat*, *gāḍ*, *mail*) of pure blood, which, after its formation in the liver, divides into two portions. One portion accompanies the blood, while the other is directed towards the spleen. The portion that remains with the blood serves both a necessity and a benefit. Its necessity is that *Sawdā'*, when mixed in a suitable proportion with blood, contributes to the nourishment of those organs in which an adequate amount and sufficient portion of *Sawdā'* is required, such as bones. The benefit is that, through this admixture, the blood becomes more concentrated, potent, and dense.^[3] The portion that goes towards the spleen is actually that which remains after being separated from the blood. This passage to the spleen also serves both necessity and benefit. Necessity is twofold: on the systemic level, *Sawdā'* contributes to the purification of the entire blood supply by diverting a waste fraction towards the spleen; otherwise, if it remained within circulation, it would disperse throughout the body and cause distress to various organs. On the organ-specific level, it plays a role in the nourishment of the spleen itself. Its benefit becomes manifest when *Sawdā'* passes from the spleen towards the *Fam al-Mi'da*. This benefit is also twofold: first, that it renders the *Fam al-Mi'da* strong, dense, and potent; second, that by its sourness, *Sawdā'* produces a kind of irritation (tickling sensation) in the *Fam al-Mi'da*, thereby stimulating hunger and activating the desire for food.^[11,13]
2. ***Sawdā' Ghayr Ṭabī'ī*:** All dark humors are counted among *Sawdā' Ghayr Ṭabī'ī*, which are produced as a result of *Ihtirāq* (Combustion).^[7] This 'burnt' form of *Sawdā'* is termed *Mirra Sawdā'*.^[8] Unlike *Sawdā' Ṭabī'ī*, it serves no physiological purpose; rather, it is harmful and produces disease. Here, *Ihtirāq* denotes an abnormal transformation that produces such *Akhlāt wa Mawād* ((Humours and Matter) which are responsible for morbid states.^[7]

On the basis of *Akhlāt*, Unani physicians have classified *Sawdā' Ghayr Ṭabī'ī* into four types:^[7]

- ***Sawdā' Ṣafrāwī* (Bilious Black bile)-** which arises from the alteration of *Ṣafrā'*.
- ***Sawdā' Balghamī* (Phlegmatic Black bile):** Which arises from the alteration of *Balgham*.
- ***Sawdā' Damawī* (Sanguineous Black bile):** Which arises from the alteration and transformation of blood *Dam*.
- ***Sawdā' Sawdāwī* (Melancholic Black bile):** Which arises from the alteration and transformation of *Sawdā'* itself.

Among these, the least harmful is *Sawdā' Damawī*, because blood is regarded as the most noble and superior humor, being the most suitable for life and health. The most harmful

is *Sawdā' Ṣafrāwī*, because bile possesses intense heat and irritation, and has the power to penetrate quickly. Yet, because of being *Laṭīf* (Light), it is also considered the most amenable to therapeutic intervention. However, in *Sawdā' Sawdāwī*, the one produced from *Raqīq* (Thin) *Sawdā'* is more harmful, whereas the one produced from *Ghalīz* (Thick) *Sawdā'* is comparatively less harmful. This is because *Raqīq Sawdā'* has greater power of penetration and infiltration into organs. Nevertheless, it is more amenable to treatment, as its *Riqqat* and heat facilitate rapid dissolution (*Tahlīl*). In contrast, the *Sawdā'* formed from *Ghalīz* (Thick) *Sawdā'*, being dense, is relatively less harmful due to its weaker power of penetration and infiltration into organs. It dissolves with difficulty and, for the same reasons, it also resists treatment. As for *Sawdā' Balghamī*, whether produced from *Raqīq* (Thin) Phlegm or *Ghalīz* (Thick) Phlegm, it is regarded as weaker and less harmful than other varieties of *Sawdā' Ghayr Ṭabī'ī*. This is because it contains *Ruṭūbat* (Moistness), which mitigates the intensity, speed, and severity of *Ihtirāq* (Combustion). However, since *Balgham* itself is a dense and viscous substance, it also undergoes dissolution slowly.^[8]

Akhḷāṭ Sawdāwīyya (Black Pigments) of the body ^[14]

The following substances in the body may be considered as sawda:

1. **Sauda'in (Melanin):** This is a dark brown or black pigment. It is found in the skin, hair, choroid coat of the eye, substantia nigra of the mid brain, etc. The normal colour of these structures is due to the presence of this pigment. The dark colour of negro's skin is due to excess of this pigment. When it is absent from the skin, the latter becomes white and develops into leucoderma, or albinism. The quantity of this pigment determines the fairness or darkness of one's skin. Its blackness renders beauty to the skin. It protects the skin from sunlight especially the penetration of ultraviolet rays of the sun. Skin exposed to sunlight becomes dark due to excessive manufacture of this pigment with ultraviolet rays. Its presence in the choroid coat of the eyes converts the eyes into a camera like dark box, which helps in vision.
2. **Black Iron Pigments:** When the red blood corpuscles are broken down and disintegration of the haemoglobin takes place, the haem part of the haemoglobin is converted into various brown or black compounds. These compounds are found in the blood as well as in the red bone marrow, liver and spleen e.g. apoferrin, ferritin, haemosidrin, and haemotidin etc. These are the compounds which serve the functions of nutrition and further synthesis of haemoglobin (*Dam*). In addition to these, haematin, haemin haemochromogen, and cathemoglobin are also iron compounds.
3. Sometimes quality of haemoglobin (*Dam*) is altered and it is converted into greyish chocolate or black colour, and becomes unable to perform its normal functions. It is a good example of *Sawdā' Damawī* which is *Dam Aswad* (Black blood) according to *Abū Saḥl Masīḥī*.
4. Sometimes haemoglobin combines with some other substances instead of *Rūḥ* (O₂). Hence its colour is altered from red to black, blue or dark brown and thus it enters into the category of *Sawdā'* e.g. Carbohaemoglobin, Carboxyhaemoglobin, Sulphaemoglobin, Nitric oxide haemoglobin and Deoxyhaemoglobin etc.

5. **Bilicyanin-** It has black or blue colour; it is produced by the *Ihtirāq* (oxidation) of biliverdin. It is *Sawdā' Ṣafrāwī* (Bilious Black bile) or *Mirra Sawdā'* (Black bile) according to physicians.
6. In addition to above there are some exogenous materials which when enter the body, render the cells black or brown e.g. carbon, lead and silver etc.
7. When internal haemorrhage occurs, the haemoglobin after some time, is converted into dark colour. Melaena or Melanuria are the results of this altered haemoglobin.

Therefore, the above account bears full testimony to the fact that *Sawdā'* (black humour) is present in the body and performs several functions and when it is altered it produces several diseases

Pathological Role of Sawdā' in Disease Development ^[15]

Imbalance in the quality, quantity, or both, of the *Sawdā'* leads to the development of *Bārid Yābis Māddī Amrād* (Cold and Dry Diseases involving Morbid Matter). The causes of this imbalance may be substances resembling the temperament of *Sawdā'*, such as *Bārid Yābis* foods, or a predominance of *Burūdat* and *Yubūsat* (Coldness and Dryness), or *Harārat* and *Yubūsat* (Hotness and Dryness), in the *Mizāj* of the digestive organs. External causes, such as occupation or climate, may also disturb the equilibrium of the humor. Some causes of humoral imbalance are hereditary, predisposing to conditions like leprosy (*Judhām*). When an excess of *Sawdā' Ghayr Ṭabī'ī* accumulates in the body, the spleen cannot fully absorb it, since it is abnormal either in quantity, quality, or both. Consequently, it circulates with the blood, from which the organs continue to derive nourishment, ultimately giving rise to severe illnesses.

Qualitatively abnormal *Sawdā'* is of two kinds: one is produced by the burning of *Sawdā' Ṭabī'ī*, and the other by the burning of *Ghayr Ṭabī'ī Ṣafrā'*. Both originate from the dominance of *Harārat* and *Yubūsat* (Hotness and Dryness). Although their temperament is cold, but when mixed with *Harārat Gharība* (Abnormal Heat), they become *Ghayr Ṭabī'ī*. Their sour taste is evidence of this temperament. When dropped on the ground, they produce effervescence like vinegar. Both varieties are corrosive to the organs and ulcerogenic, particularly the type generated from the combustion of *Ṣafrā'*.^[4]

Diseases Attributed to Abnormal Sawdā' ^[7,14]

- **Barāz Sawdāwī (Melaena):** In this disease, the stool appears black, sometimes resembling tar, signifying intestinal hemorrhage. It is also referred to as *Khalfā Sawdāwīyya*.
- **Qay' Sawdāwī:** This refers to the expulsion of *Sawdāwī* material through vomiting.
- **Bawl Aswad:** In this disease, the color of urine (*Qārūra*) turns grayish or black. Its causes may include *Saraṭān Sawdāwī* (cancer of *Sawdāwī* origin) or bleeding within the bladder (*Jarayān al-Dam fi'l Mathāna*).
- **Sawdāwīyyat (Melanosis):** Due to exposure of the sun, the skin becomes dark. Most of the chronic and debilitating diseases also render the skin dark.
- **Sal'a Sawdāwīyya (Melanoma)-** It is a type of melancholic tumor that contains *Sawda* (melanin). When it becomes malignant, it turns extremely

dangerous.

- **Saraqān Sawdāwī** ^[16] (**Melanosarcoma**)- It is a malignant form of cancer which is highly dangerous and fatal (life-threatening).
- **Saqīrūs (Scirrhus)**- A type of chronic inflammation or swelling due to accumulation of black bile, characterized by stony hardness and loss of sensation and pain; begins with small swelling which later grows and sometimes may transform into cancer.
- **Al-‘Araq al-Aswad (Blackish sweat)**- Sweat that denotes predominance of black bile in the body
- **Zufra Sawdāwīyya (Black nails)**- In this disease, blackening of nails occurs.
- **Yarqān Aswad** ^[16] (**Black jaundice**)- A morbid state characterized by gradual blackish discoloration of skin along with distension and heaviness below left lower ribs, blackish face, decreased appetite, slow pulse and weight loss.
- **Mālankhūliyā (Melancholia)**- Derangement of imagination and thinking, leading to fear, sadness, suspicion and false imaginations.

Other Allied Mental diseases

Table 1: Diet Producing Sawda ^[17]

Category	Examples
Vegetables	Cabbage
Preserved Foods	Salt-preserved plant stems Pickles with vinegar
Pulses / Legumes	Red lentils (Masoor dal) Stale pulses
Cereals / Bread	Bread prepared from un-sifted flour (with bran)
Beverages	Thick black wine
Dairy Products	Old cheese
Meat	Ox, Goat, Donkey, Camel, Rabbit, Fox, Wild boar, Oyster meat

Discussion

Sawda has a unique position in Unani medicine, serving essential physiological roles and also contributing to pathological states when get imbalanced. Classical texts emphasize on its Barid Yabis temperament, thick consistency, and influence on Sawdawi aza. Providing parallels such as melanin and black iron pigments, the functional relevance of sawda is also demonstrated in the modern perspective. Dietary and environmental factors significantly modulate the production of Sawda, focusing on preventive strategies in clinical practice.

Conclusion

Sawda (black bile) is a critical humor with dual roles: physiological (blood thickening, organ nourishment, appetite stimulation) and pathological (melanosis, melena, black urine, mental disorders). Understanding the balance of Sawda provides valuable insights into diagnostics as well as therapeutic aspect. Modern correlations of Sawda with melanin, black iron pigments, and altered hemoglobin reinforce classical descriptions, bridging traditional Unani concept and contemporary biomedical science.

Acknowledgement - N/A

Conflict of Interest - N/A

Funding - N/A

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How to Cite This Article

Sami M, Siddiqui S, Nasiruddin M, Ahmad N. A comprehensive review of *Sawdā'* (Black Bile): Classical Unani perspectives and modern correlations. International Journal of Unani and Integrative Medicine. 2025;09(03):90-93.

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