

السراج المنير

في

بيان حل الطرطير

Treatise on the Permissibility of Cream of Tartar

Darul Iftaa Dallas
Taha Syed

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

Foreword By Mufti Abdul Azeem Khan (دامت برکاتہ)

The following article on the permissibility of cream of tartar is written by Mawlana Taha Syed, a second-year student of the Darul Iftaa.

This article will make a useful read for one to understand that although potassium bitartrate (cream of tartar) may be produced during the process of fermentation, its composition and characteristics are very distinct from wine, hence causing the difference in ruling.

The article is well referenced and substantiated. In fact, this ruling of permissibility is clearly mentioned by some of our earlier *Fuqahā'*.

May *Allāh Taʿālā* accept this article for His pleasure. *Āmīn*.

Mufti Abdul Azeem Khan

28 Rabīʿ al-Awwal 1448 AH, September 10th, 2026

Darul Iftaa Dallas

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ، وَالصَّلَاةُ وَالسَّلَامُ عَلَى سَيِّدِنَا وَمَوْلَانَا مُحَمَّدٍ، وَعَلَى آلِهِ وَأَصْحَابِهِ أَجْمَعِينَ أما بعد

قال الله تعالى: لِمَ تُحَرِّمُ مَا أَحَلَّ اللَّهُ لَكَ

وقال تعالى: قُلْ أُحِلَّ لَكُمُ الطَّيِّبَاتُ

وقال النبي ﷺ: إِنَّا أُمَّةٌ أُمِّيَّةٌ، لَا نَكْتُبُ وَلَا نَحْسُبُ

صدق الله العظيم وصدق رسوله النبي الكريم ونحن على ذلك من الشاهدين والشاكرين

والحمد لله رب العالمين

Note: The following paper discusses cream of tartar produced from potassium bitartrate obtained through the wine-making process, as opposed to the synthetic method, regarding which there is no difference of opinion of its permissibility.

Introduction

Cream of tartar, scientifically known as potassium bitartrate (potassium hydrogen tartrate), is a white, crystalline substance that naturally forms during the fermentation and storage of grape juice and wine. As the wine ferments and matures, potassium bitartrate gradually crystallizes and forms a sediment or deposit on the sides and bottom of the vessel. These crystals can then be collected and purified for use in cooking and other industries.

Chemically, cream of tartar is an acidic potassium salt of tartaric acid. It is a white, odorless powder with a slightly acidic taste. Although it forms during the production and storage of wine, cream of tartar itself is chemically different from wine and is not an intoxicating substance.

Uses

Cream of tartar is commonly used in the food industry as an acidulant, stabilizer, and leavening agent. In baking, it is used to activate baking soda and help baked goods rise. It is also added to whipped egg whites to stabilize their structure and maintain their volume, particularly in the preparation of meringues. Additionally, it helps prevent sugar crystallization in candies, syrups, frostings, and other confectionery products, resulting in a smoother texture. It may also be used to regulate acidity and maintain the consistency and texture of various food products. Outside the food industry, cream of tartar is also used in certain cleaning and polishing applications.

Ḥalāl or Ḥarām?

The permissibility of cream of tartar is dependent primarily on whether the final product is considered *ṭāhir* (pure) or *najis* (impure). This forms the basis of the difference of opinion among the scholars.

Fatāwā advocating impermissibility maintain that potassium bitartrate remains impure and is therefore impermissible to consume, on the basis that it is a byproduct of the wine-making process and no *istiḥālah* (substantial transformation) has taken place in the process of the neutralization of the potassium bitartrate.

Fatāwā advocating permissibility, state that cream of tartar is considered *ṭāhir* (pure) and permissible to consume due to *istiḥālah* (substantial transformation) having taken place.

There are also a third group of scholars who hold the opinion that cream of tartar is *mashbūh* (doubtful). Interestingly, they maintain that potassium bitartrate obtained through the wine-making process is essentially pure; however, due to uncertainties regarding the refinement process and the presence of ambiguous additives, they have classified cream of tartar as *mashbūh* (doubtful) and recommend that it be avoided.

In summary, the scholarly opinions available online can broadly be divided into three categories. The first group holds that cream of tartar is impermissible because potassium bitartrate is a byproduct of the wine-making process and maintains that the subsequent neutralization process does not constitute *istiḥālah*; therefore, the substance remains impure and impermissible to consume. The second group holds that subsequent transformation of the tartaric acid and potassium into potassium bitartrate crystals constitute *istiḥālah*, thereby rendering the final product pure and permissible to consume. The third group considers cream of tartar to be *mashbūh* (doubtful). While maintaining that potassium bitartrate obtained from the wine-making process is essentially pure, this group considers the final product doubtful due to uncertainties surrounding the refinement process and the use of ambiguous additives.

May *Allah Taʿālā* reward all three groups of scholars for their sincere efforts and for striving to reach the truth. Nevertheless, there appear to be certain aspects that may have been overlooked which will be discussed and clarified below.

Takyīf: Sharʿī Framing

In order to fully understand the ruling of cream of tartar, it is first necessary to understand the ruling of its original crystallized form: potassium bitartrate.

Potassium bitartrate is a naturally occurring potassium salt of tartaric acid, with the chemical formula $C_4H_5KO_6$. It is a white, crystalline, acidic substance that commonly forms as a byproduct of wine production, where it precipitates as crystals from grape juice or wine. These crystals are also referred to as “tartrates” or “wine diamonds”

These crystals accumulate on the surfaces of wine tanks, barrels, and other equipment, where they are collected and separated from the wine. The collected crystals may contain wine residues and other impurities; therefore, they are washed and further processed to remove these unwanted substances. Depending on the manufacturing process and the required level of purity, the crude tartrate material may undergo additional chemical treatment and purification. The purified potassium bitartrate is then dried to remove moisture, after which the dried crystals are finely ground into a white powder. The resulting fine white powder is known as cream of tartar, which is essentially food-grade potassium bitartrate.

Given the above we understand the following:

1. Potassium bitartrate is a potassium salt that occurs in crystalline form and is intrinsically *ṭāhir* (pure).

2. Potassium bitartrate is not the same substance as the dregs, lees, sediment, or "beeswing" of wine.

3. Potassium bitartrate is not a direct byproduct of the wine dregs or the wine itself; rather, it forms as a result of the fermentation process involved in winemaking.

4. The refinement process of potassium bitartrate involves washing and purifying the same crystals, which are then dried and ground into a fine powder to produce cream of tartar.

Each of these points will be explained in detail.

<u>Point #1</u>

To understand this, it is necessary to realize that potassium bitartrate is a pure crystalline substance which does not intoxicate. Wine on the other hand is impure and intoxicates.

The process of crystallization itself functions as a means of purification and *istiḥālah*.

The *Ḥanafī Fuqahāʾ* have discussed the concept of *istiḥālah* in their works and have cited numerous examples for us to properly understand this principle. Among the examples discussed by the *Fuqahāʾ* is that of crystallization.

Observe the following:

1.

منها الكلب: إذا وقع في الملاحة والجمد والعذرة: إذا أحرقت بالنار وصارت رماداً، وطين البالوعة: إذا جف وذهب أثره، والنجاسة إذا دفنت في الأرض وذهب أثرها بمرور الزمان...

*"**Among them is a dog, [which becomes pure] if it falls into a saltworks**; and dung, if it is burned by fire and becomes ash; and the mud of a cesspool, if it dries and its traces disappear; and impurity, if it is buried in the earth and its traces disappear with the passage of time"*

(*Badāʾiʿ al-Ṣanāʾiʿ fī Tartīb al-Sharāʾiʿ*, vol. 1, pp. 441–442, Dār al-Kutub al-ʿIlmiyyah.)

2.

الاستعمال الفقهي الأول: بمعنى تحول الشيء وتغيره عن وصفه. ومن ذلك استحالة العين النجسة. وبم تكون الاستحالة؟ الأعيان النجسة، كالعذرة، والخمر، والخنزير، قد تتحول عن أعيانها وتتغير أوصافها وذلك بالاحتراق أو بالتخليل، أو بالوقوع في شيء طاهر، كالخنزير يقع في الملاحة، فيصير ملحا.

"The first juristic usage: It refers to the transformation of a thing and its changing from its original characteristics. An example of this is the transformation of an impure substance (istiḥālat al-ʿayn al-najisah). How does such transformation occur? Impure substances, such as excrement, wine, and swine, may transform from their original substances and their characteristics may change. ***This can occur through burning, conversion into vinegar, or by falling into something pure: for example, when a pig falls into a saltworks and becomes salt.***"

(al-Mawsūʿah al-Fiqhiyyah al-Kuwaytiyyah, vol. 3, p. 212, Dār al-Salāsil, Kuwait)

3.

(قَوْلُهُ: لِانْقِلَابِ الْعَيْنِ) عِلَّةٌ لِلْكُلِّ، وَهَذَا قَوْلُ مُحَمَّدٍ، وَذَكَرَ مَعَهُ فِي الذَّخِيرَةِ وَالْمُحِيطِ أَبَا حَنِيفَةَ حِلْيَةٌ. قَالَ فِي الْفَتْحِ: وَكَثِيرٌ مِنْ الْمَشَايِخِ اخْتَارُوهُ، وَهُوَ الْمُخْتَارُ؛ لِأَنَّ الشَّرْعَ رَتَّبَ وَصْفَ النَّجَاسَةِ عَلَى تِلْكَ الْحَقِيقَةِ وَتَنْتَفِي الْحَقِيقَةُ بِانْتِفَاءِ بَعْضِ أَجْزَاءِ مَفْهُومِهَا فَكَيْفَ بِالْكُلِّ؟ فَإِنَّ الْمِلْحَ غَيْرُ الْعَظْمِ وَاللَّحْمِ، فَإِذَا صَارَ مِلْحًا تَرَتَّبَ حُكْمُ الْمِلْحِ. وَنَظِيرُهُ فِي الشَّرْعِ النُّطْفَةُ نَجِسَةٌ وَتَصِيرُ عَلَقَةً وَهِيَ نَجِسَةٌ وَتَصِيرُ مُضْغَةً فَتَطْهُرُ، وَالْعَصِيرُ طَاهِرٌ فَيَصِيرُ خَمْرًا فَيَنْجُسُ وَيَصِيرُ خَلًّا فَيَطْهُرُ، فَعَرَفْنَا أَنَّ اسْتِحَالَةَ الْعَيْنِ تَسْتَتْبِعُ زَوَالَ الْوَصْفِ الْمُرَتَّبِ عَلَيْهَا. اهـ.
[تَنْبِيهٌ] يَجُوزُ أَكْلُ ذَلِكَ الْمِلْحِ وَالصَّلَاةُ عَلَى ذَلِكَ الرَّمَادِ كَمَا فِي الْمُنْيَةِ وَغَيْرِهَا، وَمَا فِيهَا مِنْ أَنَّهُ لَوْ وَقَعَ ذَلِكَ الرَّمَادُ فِي الْمَاءِ فَالصَّحِيحُ أَنَّهُ يَنْجُسُ فَلَيْسَ بِصَحِيحٍ إلَّا عَلَى قَوْلِ أَبِي يُوسُفَ كَمَا ذَكَرَهُ الشَّارِحَانِ.

"His statement, 'due to the transformation of the substance itself (li-inqilāb al-ʿayn),' is the reason underlying all of these cases. This is the view of Muḥammad [ibn al-Ḥasan]. Al-Dhakhīrah and al-Muḥīṭ also attributed this position to Abū Ḥanīfah. Ḥilyah [al-Zaylaʿī] stated: 'In al-Fatḥ, it is mentioned that many of the jurists chose this view, and it is the preferred position, because the Sharīʿah attached the ruling of impurity to that particular substance/entity. When the entity itself ceases to exist, the ruling likewise ceases, even if only some of the constituent elements of its definition disappear—so what about when the entirety of it disappears? ***Salt is different from bone and flesh; therefore, when it becomes salt, the ruling of salt applies to it****.'*

"An analogous example in the Sharīʿah is the nuṭfah (seminal fluid): it is impure, then it becomes an ʿalaqah (clinging clot), which is also impure, and then it becomes a muḍghah (chewed-like lump), at which point it becomes pure. Likewise, juice is pure, then it becomes wine and becomes impure, and then it becomes vinegar and becomes pure. Thus, we understand that the transformation of the substance itself entails the removal of the ruling that was attached to it."

[Note] *"****It is permissible to eat that salt and to perform ṣalāh upon those ashes, as mentioned in al-Munyah and other works****. As for the statement therein that if those ashes were to fall into water, the water would become impure, this is not correct—except according to the view of Abū Yūsuf, as mentioned by the two commentators."*

(Radd al-Muḥtār ʿalā al-Durr al-Mukhtār, vol. 2, p. 383, Dār al-Salām edition)

4.

الحمار أو الخنزير إذا وقع في المملحة فصار ملحاً أو بئر البالوعة إذا صار طيناً يظهر عندهما خلافاً لأبي يوسف رحمه الله كذا في محيط السرخسي

*"****The donkey or the pig, if it falls into a saltworks and becomes salt****; or the cesspool well, if it becomes clay—the ruling of purity becomes apparent according to both of them, contrary to Abū Yūsuf, may Allah have mercy on him. This is as stated in Muḥīṭ al-Sarakhsī."*

(al-Fatāwā al-Hindiyyah, vol. 1, p. 50, Dār al-Kutub al-ʿIlmiyyah.)

5.

وفى نوادر إبراهيم عن محمد في حمار وقع في المملحة ومات وترك حتى صار ملحا أكل الملح، وقال أبو يوسف: لا يؤكل، وكذلك رماد عذره أحرقت وصلى عليه على هذا الاختلاف

"In the Nawādir of Ibrāhīm, it is narrated from Muḥammad concerning ***a donkey that fell into a saltworks, died, and was left there until it became salt: the salt may be eaten****. Abū Yūsuf said: it may not be eaten. Likewise, regarding the ashes of its dung after it was burned, [the ruling is the same:] ṣalāh may be performed upon them according to this difference of opinion."*

(*al-Fatāwā al-Tātārkhāniyyah*, *vol. 1, p. 464*, *Maktabah Zakariyyā, Deoband*.)

6.

وفي «نوادر إبراهيم» عن محمد في حمار وقع في الملاحة ومات وترك حتى صار ملحاً أكل الملح، وقال أبو يوسف: لا يؤكل،

"*In Nawādir Ibrāhīm, it is narrated from* ***Muḥammad regarding a donkey that fell into a saltworks and died, and it was left there until it became salt: the salt may be eaten.*** *Abū Yūsuf said: It may not be eaten."*

(al-Muḥīṭ al-Burhānī fī al-Fiqh al-Nuʿmānī, vol. 1, p. 206, Dār al-Kutub al-ʿIlmiyyah)

As seen above, the *Fuqahā'* mention the example of a donkey or swine falling into a salt mine or salt cellar and transforming into salt. In such a case, the resulting salt is considered *ṭāhir* (pure) and permissible to consume, as the original substance has undergone a complete transformation into a different substance. This is originally the position of *Imām Muḥammad (raḥimahullāh)* and *Imām Abū Ḥanīfah (raḥimahullāh)*, and it is the preferred position within the *Ḥanafī Madhhab*.

Furthermore, *ʿAllāmah Ibn ʿĀbidīn al-Shāmī (raḥimahullāh)*, in his *Radd al-Muḥtār*, not only discusses the aforementioned examples but also explicitly mentions the crystallization of potassium bitartrate alongside other examples of *istiḥālah*:

قُلْت: لَكِنْ قَدْ يُقَالُ: إنَّ الدِّبْسَ لَيْسَ فِيهِ انْقِلَابُ حَقِيقَةٍ؛ لِأَنَّهُ عَصِيرٌ جَمَدَ بِالطَّبْخِ؛ وَكَذَا السِّمْسِمُ إذَا دُرِسَ وَاخْتَلَطَ دُهْنُهُ بِأَجْزَائِهِ فَفِيهِ تَغَيُّرُ وَصْفٍ فَقَطْ؛ كَلَبَنٍ صَارَ جُبْنًا، وَبُرٍّ صَارَ طَحِينًا، وَطَحِينٍ صَارَ خُبْزًا؛ بِخِلَافِ نَحْوِ خَمْرٍ صَارَ خَلًّا وَحِمَارٍ وَقَعَ فِي مَمْلَحَةٍ فَصَارَ مِلْحًا، وَكَذَا دُرْدِيُّ خَمْرٍ صَارَ طِرْطِيرًا(١) وَعَذِرَةٌ صَارَتْ رَمَادًا أَوْ حَمْأَةً، فَإِنَّ ذَلِكَ كُلَّهُ انْقِلَابُ حَقِيقَةٍ إلَى حَقِيقَةٍ أُخْرَى لَا مُجَرَّدُ انْقِلَابِ وَصْفٍ كَمَا سَيَأْتِي – وَاَللَّهُ أَعْلَمُ -.

"I say: However, it may be argued that dibs (thickened grape syrup) does not involve a transformation of the substance itself, because it is merely juice that has solidified through cooking. Likewise, when sesame is ground and its oil mixes with its other components, this involves only a change in its characteristics, similar to milk becoming cheese, wheat becoming flour, and flour becoming bread. ***This differs from examples such as wine becoming vinegar, a donkey falling into a salt mine and becoming salt, and likewise the dregs of wine becoming ṭarṭīr (potassium bitartrate),*** *or feces becoming ashes or mud. For all of these involve a transformation of one substance into an entirely different substance, rather than merely a change in its characteristics, as will be discussed later. And Allah knows best."*

(Radd al-Muḥtār ʿalā al-Durr al-Mukhtār, vol. 2, p. 349 ,Dār al-Salām edition).

Some may argue that the *ṭarṭīr* mentioned by *ʿAllāmah Ibn ʿĀbidīn al-Shāmī* (*raḥimahullāh*) is not the potassium bitartrate under discussion. However, this claim is unfounded, as a cursory glance at Arabic dictionaries will prove that *ṭarṭīr* indeed refers to the very same potassium bitartrate in reference.

Observe the following:

1. Reinhart Dozy, *Takmilat al-Maʿājim al-ʿArabiyya*:

طَرْطَر :طرطر: رفع ذنبه، أي ذيله) *ألف ليلة* ب: 8). وطرطر: كدّس، كوّم، راكم) *فوك*. (**طَرْطَر** :دُرْدِيّ، رسوب الكَدَر في أسفل دَنّ النبيذ؛ ثُفْل، حُثَالَة، رَاسِب) *فوك، ألكالا*. (وينقل دوكانج عبارةً من المعجم الطبي لسيمون دي جنيتر، وهي: «تَرتَر، عربية، وهي ما يرسب من الخمر في الدن»، وهي في الحقيقة **دُرْدِيّ**، وقد

ذكرها فوك في مادة *fex*، وقد حرّفها أصحاب الكيمياء فصارت *tatarum* بالأسبانية. و *Tataro* بالبرتغالية والإيطالية، و *tartre* بالفرنسية، وقد استعملها العرب بصيغتها المحرّفة هذه. ويقال أيضاً: طرطير وطرطق... طرطير: ثفل، حثالة، راسب، دُرديٌّ وملح الطرطير: ملح الحثالة، وطرطير مُطرِش الطرطير المقيئ: الثفل الذي يسبب القيء (بوشر) وانظر: طَرُطَر.

*"**Ṭarṭar:** Ṭarṭara: "He raised his buttocks, i.e., his tail" (Alf Layla, B: 8). Ṭarṭara also means "to pile up, heap up, or accumulate" (Fok). **Ṭarṭar:** Durdī, the sediment or turbid residue that settles at the bottom of a wine cask; "dregs, lees, sediment, residue" (Fok, Alcalá). Du Cange نقل نقل a phrase from the medical lexicon of Simon de Genetier, namely: **"Tartar, Arabic, that which settles from wine in the cask." In reality, however, the Arabic word is durdī.** Fok mentions it under the entry fex, and the alchemists corrupted the term, resulting in tatarum in Spanish. Tataro is found in Portuguese and Italian, while tartre is the French form; **the Arabs also used this corrupted form**. It is also said as **ṭarṭīr** and **ṭarṭaq**. Ṭarṭīr: "dregs, residue, sediment, lees"; **milḥ al-ṭarṭīr: "the salt of the dregs**; and ṭarṭīr muṭarriš al-ṭarṭīr al-muqayyi': "the residue that causes vomiting" (Bocthor). See also: ṭaruṭar."*

2. Aḥmad Mukhtār ʿUmar, *Muʿjam al-Lughah al-ʿArabiyyah al-Muʿāṣirah:*

طِرطِير [مفرد]: ج طراطيرُ: (كم) حمض الدُّرْديّ [حمض الطِّرطِريك]، وهو حمض عضوي توجد منه أنواع متناظِرة، والنوع العادي بلوراته شفافة، يذوب في الماء والكحول ويوجد عادة في أنسجة الخضر والفاكهة

*"Ṭirṭīr [singular]: plural ṭarāṭīr: (Chemistry**) tartaric acid [tartaric acid of the dregs]**. It is an organic acid that occurs in several stereoisomeric forms. **The ordinary form has transparent crystals**, dissolves in water and alcohol, and is commonly found in the tissues of vegetables and fruits."*

3. Arabic Language Academy in Cairo, *Al-Muʿjam al-Wasīṭ*:

(الطراطير) دردي الْخمر مُعرب (ترتير) باليونانية هَذَا أَصله ثمَّ اسْتعْمل فِي كل دردي (ج) طراطير و (فِي الكيمياء) حمض الدردي (حمض الطرطريك) وَهُوَ حمض عضوي تُوجد مِنْهُ أَنْوَاع متناظرة وَالنَّوْع العادي بلوراته شفافة يذوب فِي المَاء والكحول وَيُوجد عَادَة فِي أنسجة الْخضر والفاكهة (مج)

"al-ṭarāṭīr (الطَّرَاطِير): The dregs of wine. It is an Arabicized form of the Greek tartēr; this is its original derivation. It was subsequently used for the dregs or sediment of anything. Its plural is ṭarāṭīr. ***<u>In chemistry: tartaric acid (ḥamḍ al-durdī, "acid of the dregs"), also called tartaric acid. It is an organic acid that exists in several stereoisomeric forms. The ordinary form consists of transparent crystals, dissolves in water and alcohol, and is commonly found in the tissues of vegetables and fruits</u>***."

4. Hans Wehr, *A Dictionary of Modern Written Arabic*:

طرطير *ṭarṭīr* tartar, wine stone

5. F. Steingass, *The Student's Arabic-English Dictionary*:

طرطير *ṭartīr*, tartar (salt).

6. Rohi Baalbaki, *Al-Mawrid: A Modern Arabic-English Dictionary*:

tartar	طَرْطِير : دُرْدِيّ
argol, crude tartar	طَرْطِيرٌ خام
tartar emitic	طَرْطِيرٌ مُقَيِّئ
tartaric	طَرْطِيرِيّ: مَنْسُوبٌ إلى الطَّرْطِير

Given the above, it becomes evident that *ṭarṭīr* does indeed refer to potassium bitartrate, and that this is precisely the substance to which *ʿAllāmah Ibn ʿĀbidīn al-Shāmī* was referring as an example of *istiḥālah*.

Point #2

Those who have deemed cream of tartar impermissible have based their ruling on the impermissibility of *durdī al-khamr*, i.e., the dregs, lees, or sediment, (also referred to as "beeswing") of wine.

This is incorrect, as explained under Point #1: *durdī al-khamr* and *ṭarṭīr* are two entirely different substances.

This can be understood from the statement of *ʿAllāmah Ibn ʿĀbidīn al-Shāmī*, who clearly distinguishes between the two:

وكَذَا دُرْدِيُّ خَمْرٍ صَارَ طِرْطِيرًا(١)

"Likewise, the dregs of wine once they have transformed into ṭarṭīr (Potassium bitartrate)"

The editor of the above-quoted edition of *Radd al-Muḥtār* refers to this difference as well:

(١) الدردي: هو ما رسب من العصارات لا ما ترشح منها كما ظن إذ المترشح صافي الشيء، والدردي كبيره وأكثرها منفعة دردي الخمر، ويعرف بالطرطير إذا جف اهـ تذكرة أولي الألباب" للأنطاكي ١/١٥٢، وانظر لسان العرب مادة ((درد)).

Editor's notes: "Al-Durdī (الدُّرْدِي): It refers to the sediment that settles from liquids and juices, not that which is strained from them, as some have mistakenly understood. That which is strained is the purified portion of the substance. The largest and most beneficial type of dirdī is the sediment of wine, which is known as ṭarṭīr (طرطير) when it dries."— Tadhkirat Uli al-Albāb of al-Anṭākī, 1/152. See also Lisān al-ʿArab, entry "درد."

It appears that the editor has paraphrased the original quotation, the original quote from *Dāwūd al-Anṭākī's Tadhkirat Ūlī al-Albāb wa'l-Jāmiʿ li'l-ʿAjab al-ʿUjāb* is as follows:

(دردي) هو ما رسب من العصارات لا ما ترشح منها كما ظن إذا المترشح صافي الشئ والدردي كثره وتتبع في طبعها الأصل وأكثرها منفعة دردي الخمر ويعرف بالطرطير إذا جفف

***"Durdī:** It is that which settles from liquids, not that which is strained or filtered from them, as has been mistakenly assumed. The material that is strained is clear, whereas durdī is characterized by its abundance of sediment. Its properties generally follow those of the original substance, and the most beneficial type is the durdī of wine, which is known as ṭarṭīr when it is dried."*

Hereunder are excerpts from various Arabic dictionaries:

1. Arabic Language Academy in Cairo, *Al-Muʿjam al-Wasīṭ*:

(الدردي) مَا رسب أَسْفَل الْعَسَل وَالزَّيْت وَنَحْوهمَا من كل شَيْء مَائِع كالأشربة والأدهان والخميرة تتْرك على الْعصير ليتخمر وَفِي حَدِيث الباقر (أَتَجْعَلُونَ فِي النَّبِيذ الدردي) قيل وَمَا الدردي قَالَ (الروبة

"(al-Durdī): That which settles at the bottom of honey, oil, and similar substances, including all types of liquids such as beverages, oils, and yeast that is left on the juice in order for it to ferment.
In the narration of al-Bāqir: "Do you put the durdī into nabīdh?" He was asked, "What is durdī?" He replied: "The sediment (al-rūbah)."

2. Ibn Manẓūr, *Lisān al-ʿArab*:

ودُرْدِيُّ الزَّيْتُ وَغَيْرُهُ: مَا يَبْقَى فِي أَسفله. وَفِي حَدِيثِ الْبَاقِرِ: أَتجعلون فِي النَّبِيذِ الدُّرْدِيَّ؟ قِيلَ: وَمَا الدُّرْدِيُّ؟ قَالَ: الرَّوْبَةُ ؛ أَراد بِالدُّرْدِيِّ الْخَمِيرَةَ الَّتِي تُتْرَكُ عَلَى الْعَصِيرِ وَالنَّبِيذِ لِيَتَخَمَّرَ، وأَصله مَا يَرْكُدُ فِي أَسفل كُلِّ مائع كالأَشربة والأَدهان.

"The durdī of oil and other substances is that which remains at the bottom. In the narration of al-Bāqir: 'Do you put the durdī into nabīdh?' He was asked, 'What is durdī?' He replied, 'Al-rūbah' (the sediment) By durdī, he intended the fermenting substance (khamīrah) that is left in juice and nabīdh so that it may ferment. Originally,

the term refers to that which settles at the bottom of every liquid, such as beverages and oils."

3. Muḥammad Murtaḍā al-Zabīdī, *Tāj al-ʿArūs min Jawāhir al-Qāmūs*:

(ودُرْدِيُّ الزَّيْتِ) ، بالضّمّ: (مَا يبْقَى أسْفَلَهُ) وَفِي حَدِيث الباقر: (أَتَجْعَلُونَ فِي النَّبِيذ الدُّرْدِيَّ؟ قيل: وَمَا الدُّرْدِيُّ؟ قَالَ: الرَّوْبَةُ) أَراد بالدُّرْدِيّ الخَمِيرَةَ الَّتِي تُتْرَكُ على العَصِيرِ والنَّبِيذِ ليتخمّر، وأَصلهما يَرْكُدُ فِي أَسفلِ كُلِّ مائعٍ كالأَشربة والأَدْهَان

"The durdī of oil, with the ḍammah, is that which remains at the bottom of it. In the narration of al-Bāqir, it is mentioned: 'Do you put the durdī into nabīdh?' They asked, 'What is durdī?' He replied, 'Al-rūbah.' By durdī, he intended the fermenting substance (khamīrah) that is left on juice and nabīdh so that they may ferment. Originally, however, durdī refers to that which settles at the bottom of every liquid, such as beverages and oils."

4. Rohi Baalbaki, *Al-Mawrid: A Modern Arabic-English Dictionary*:

دُرْدِيّ: عَكَر ، راسِب ، ثُفْل dregs, lees, sediment, settlings

5. Hans Wehr, *A Dictionary of Modern Written Arabic*:

دردى *durdī* sediment, dregs, lees

6. Edward William Lane, *An Arabic-English Lexicon:*

دُرْدِىٌّ The *dregs, feces, lees,* or *sediment,* or *what remains at the bottom,* of olive-oil, (Ṣ, Ḳ,) and of other things, (Ṣ,) or of [the beverage

7. F. Steingass, *The Student's Arabic-English Dictionary*:

دردی *durdiyy*, dregs, sediment.

8. Buṭrus al-Bustānī, *Muḥīṭ al-Muḥīṭ:*

دُرْدِيُّ الزيت وغيره ما يبقى راسبًا في اسفلهِ من الكَدَر*

9. Waḥīd al-Zamān al-Kairānawī, *Al-Qāmūs al-Waḥīd*:

الدُّرْدِیُّ: ہر سیال شے کی تلچھٹ (۲) خمیر
یا دہ ترش دہی وغیرہ جس کے ملانے
سے دوسری چیز بھی ترش ہو جائے
یا جم جائے، حدیث باقر میں ہے:
"أتجعلون فی النبیذ
الدُّرْدِیَّ؟ قیل: وما الدُّرْدِیُّ؟
قال: الرُّوبَۃُ"

Translation*: Durdī: The sediment or residue of any liquid substance. Ferment or sourdough, a substance that has become more sour or fermented, etc., such that when it is added to another substance, it causes that substance to become sour or to solidify. In the narration of al-Bāqir, it is mentioned: "Do you put the durdī into nabīdh?" They asked, "What is durdī?" He replied, "Al-rūbah."*

Given the above, it becomes clear that *durdī al-khamr* and *ṭarṭīr* are two different substances, and each will have its own respective ruling.



Dregs of wine (durdī al-khamr)



Potassium bitartrate (ṭarṭīr)

Point #3

Potassium bitartrate is not a direct byproduct of the wine dregs or the wine itself; rather, it forms as a result of the fermentation process involved in winemaking.

It is crucial to understand this in order to give a final ruling on the cream of tartar.

As explained above, potassium bitartrate is a natural byproduct of the winemaking process and does not form directly from the wine itself or from its dregs.

Observe the following:

1. *"Juice is typically supersaturated with potassium bitartrate at crushing. As the alcohol content rises during fermentation, the solubility of the bitartrate decreases. This induces the slow precipitation of potassium bitartrate (cream of tartar). Given sufficient time, the salt crystals precipitate spontaneously. In northern regions, low cellar temperatures may induce adequately rapid precipitation."*

   Source: https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/potassium-bitartrate

2. *"Cream of tartar is the common name for potassium hydrogen tartrate, an acid salt used in cooking. It exists naturally in grape juice, but being insoluble in alcohol, it is gradually deposited, in the form of argol, as the sugar of the juice becomes converted into alcohol by fermentation. In the preparation of cream of tartar, the argol is dissolved in hot water, to which charcoal or fine clay is added, to take up the coloring matter; by boiling and filtering, a clear colorless solution is obtained. When cooled, the cream of tartar seperates as crystals. These crystals, after being exposed to the air for several days, become whiter and constitute the crystals of tartar, or, when ground to powder, cream of tartar. Although cream of tartar is, practically speaking, tartaric acid, it usually contains from 5 to 10 percent of tartrate of lime, while other impurities may also be present. Cream of tartar is readily soluble in hot water, though it takes 60 parts of cold water to dissolve one part of it. Cream of tartar has an acid taste and a gritty feel. — William and Robert Chambers, Chambers's Encyclopedia: A Dictionary of Useful Knowledge, Volume III (Philadelphia: J.B. Lippincott & Co., 1889), 551. Photo shows vats of cream of tartar in California wine country, early 1900s."*

   Source: http://www.pioneergirl.com/blog/archives/4498

3. *"Cream of tartar is obtained by extracting the sediment that is removed from clear wine, argol. Hot water will dissolve cream of tartar from the sediment and once filtered and cooled, pure crystals of potassium acid tartrate remain."*

Source: https://bakerpedia.com/ingredients/cream-of-tartar

4. *"It has been known that the pomace or refuse from wineries contains cream of tartar, and for some time the production of cream of tartar from this pomace has been carried on in a crude way by boiling the pomace. It has been found, however, that by this method only a small part of the tartrates originally contained in the pomace were extracted, since as soon as the pomace was produced in the process of manufacturing wine, fermentation at once set in and very quickly destroyed a large part of the tartrates which were originally contained in the pomace, by reducing them to other compounds. In order to retain all of the tartrates in a condition in which they may be subsequently extracted from the pomace, it is necessary that this fermentation be prevented. The pomace, therefore, as soon as produced, is thoroughly dried under a gentle artificial heat, if desired, so that fermentation is entirely prevented. The tartrates which are contained in grape pomace are the ordinary cream of tartar, that is to say, the bitartrate of potassium and small quantities of other soluble tartrates, but the tartrate of calcium is present in even larger quantities, and this is completely insoluble in even hot water, so that by the crude method of extracting the tartrates hitherto practiced, this calcium tartrate remained insoluble and was not extracted from the pomace. By our improved process, this calcium tartrate is first converted into the bitartrate of potassium, and then all the tartrates are extracted from the pomace and completely separated by solution in hot water and are thereafter separated therefrom in the usual way. This process of converting the calcium tartrate is based upon the fact that calcium tartrate is readily decomposed by oxalic acid, the products of this reaction being free tartaric acid and insoluble oxalate of calcium, which is precipitated from the solution. The free tartaric acid, as it is produced in connection with the pomace, unites with potassium salts which are normally present therein to form the bitartrate of potassium, or cream of tartar."*

Source: ***U.S. Patent 783,524, "Process of Making Cream of Tartar," Hooven & Endemann (1905).***

Source: https://patentimages.storage.googleapis.com/46/ef/6c/b48176964999b0/US783524.pdf

5. *"Another way that acidity gets lowered in grapes is by formation of malate and tartrate salts with soluble metal ions of potassium, calcium, and magnesium. These ions are important soil and plant nutrients, especially potassium (K+). Potassium is a key component of most fertilizers that contain potassium, nitrogen, and phosphorus. As these metal ions react with malic and tartaric acid, the level of acidity is reduced, and pH goes up. These salts can also create a "buffering" effect that limits the effectiveness of any tartaric acid added in the winery to increase acidity in the wine. Thus, raising acidity during fermentation is not always straightforward."*

Source: https://www.texaswinecollective.com/blog/acidity-in-wine---part-1-in-the-vineyard

From the above we understand that Potassium bitartrate is collected from the sediments of the wine and is not a direct byproduct of the dregs or wine itself.

Misconception

One misconception that may arise is that, since potassium bitartrate crystals are commonly collected from wine barrels, they are solely a byproduct of the winemaking process. This is incorrect. Both potassium and tartaric acid are naturally present in grapes, and due to neutralization combine to form potassium bitartrate crystals which gradually precipitate out of the wine and crystalize on the sides and bottom of the vessel.

However, fermentation is not the only process through which potassium bitartrate crystals can form. Potassium bitartrate crystals can also form in grape juice, jelly, and jam as a result of cooling. When these products are cooled, particularly to temperatures below approximately 40°F (4°C), the solubility of potassium bitartrate decreases, resulting in the crystallization and separation of potassium bitartrate

Furthermore, the formation of potassium bitartrate is not exclusive to grapes; it can occur in practically any fruit that contains both tartaric acid and potassium, including tamarind, bananas, avocados, apples, cherries, papayas, peaches, pears, pineapples, strawberries, mangoes, and citrus fruits.

Observe the following:

1. *"Detartration during grape juice processing*

   Cream of tartar is also commercially produced as a by-product of grape juice processing. Wine, especially artisanal and homemade wine, can be produced by fermenting grape juice, either single strength juice or juice concentrate. Some kits for home winemaking rely on juice concentrates. Processors of grape juice and grape juice concentrate routinely cold stabilize these products to remove excessive potassium acid tartrate (Bates, Morris, and Crandall 2001). This improves the appearance of the wine

and the perception of its quality "Grape juice is cooled to precipitate potassium acid tartrate prior to bottling, in order to prevent precipitation in the retail juice product. Grapes are unique from other fruits in that, after juice extraction, the argols (potassium bitartrate, tartar in crude form) and tartrates must be precipitated. Otherwise, the argols will settle out upon cooling or even when filtered juice is refrigerated. These crystals, although harmless, are aesthetically unpleasant and can be mistaken for glass fragments. Thus to accomplish detartration (cold stabilization), the filtered juice is flash heated at 80 to 85°C in a tubular or plate-type heat exchanger, rapidly cooled in another heat exchanger to 22°C and placed in tanks for rapid settling of argols. Seeding with bitartrate crystals and ion exchange methods exist to accelerate the cold stabilization step. The final processing into a single strength juice or concentrate can occur once the argols have settled and the juice is racked off. The sediment can be filtered, resterilized and stored to allow the argols to settle again for optimal recovery of juice." (Bates, Morris, and Crandall 2001)

Joslyn and Tucker (Joslyn and Tucker 1930) were able to remove potassium tartrate (cream of tartar) more efficiently from grape juice by freezing the juice."

"All of the potassium and all of the tartrate that make up the composition of potassium acid tartrate originate in the grapes. Grapes contain high concentrations of tartrates"

Source:
https://www.ams.usda.gov/sites/default/files/media/Potassium%20Acid%20Tartrate%20TR%20Final%2001%2011%2017.pdf

2. *"When juice is extracted from grapes and cooled, the tartaric acid reacts with potassium, the mineral of highest concentration in most grape juices, to form harmless potassium bitartrate crystals, also known as tartrate crystals or tartrates. While the crystals pose no food safety risk, they are certainly unwanted when preparing grape juice, syrup, jams, jellies, and even wine. Tartrates in wine are known as wine diamonds and may appear as salt crystals, glass shards, or fine dust in a bottle or glass of wine—visual defects that the wine industry works hard to prevent. Tartaric acid is used in the making of cream of tartar."*

   Source: https://blogs.extension.iastate.edu/answerline/2023/08/29/preventing-crystals-in-grape-jelly-jam-syrup-and-juice-2/

3. *"Grapes are unique from other fruits because, the tartrate salts (Potassium Hydrogen Tartrate (KHT) and Calcium Tartrate (CaT)) which are naturally present in grape juice, must be precipitated or stabilized after juice extraction. However, these salts will settle upon cooling or even when filtered juice is refrigerated. These crystals, although harmless, are aesthetically unpleasant and can be mistaken for glass fragments"*

   Source: https://pmc.ncbi.nlm.nih.gov/articles/PMC4252401/

4. *"Few fruits other than grapes contain significant amounts of tartaric acid. One half to two thirds of the acid content of ripe grapes is tartaric acid, and it is the strongest of the grape acids. Tartaric acid is responsible for much of the tart taste of wine, and it contributes to both the biological stability and the longevity of wine.*
   The amount of tartaric acid in grapes remains practically constant throughout the ripening period. However, the situation in wine is different. The quantity of tartaric acid slowly decreases in wine by small amounts. Both potassium and calcium combine readily with tartaric acid and form potassium bitartrate and calcium tartrate compounds. Then crystals of these two materials precipitate out of the wine during fermentation. These tartrate materials can continue to precipitate for a long time, and aged wine usually contains about two thirds as much tartaric acid as the starting grapes because of tartrate precipitation. Unfortunately, these acid salts of potassium and calcium precipitate very slowly at normal cellar temperatures, and wine can contain excessive quantities of these materials even after many months of aging. Wineries use special wine treatments to speed up tartrate precipitation. Cooling the wine is the most commonly used procedure. Just cooling the wine to about 27 degrees causes excess potassium salts to precipitate out in a few days."

   Source: https://www.homebrewit.com/pages/a-detailed-explanation-of-acids-used-in-wine-making



Potassium bitartrate crystals in grape juice

Point #4

Before the Potassium bitartrate crystals are crushed to form cream of tartar, they undergo a rigorous process of purification and refinement.

Firstly, the material containing potassium bitartrate along with other substances and impurities is collected and the crystals are washed to remove wine and other soluble materials. Then they are dissolved in hot water, allowing the potassium bitartrate and other soluble tartrates to enter the solution while insoluble impurities can be separated. The solution is then filtered to remove remaining solid matter. After this, the solution is cooled, causing the potassium bitartrate to crystallize again. The crystals are separated from the remaining liquid, washed, and dried. Finally, the purified crystals are dried and ground into a fine white powder.

Observe the following:

1. *"Potassium bitartrate is often produced as a by-product of winemaking. Lees (sediment) are collected following the fermentation process and dissolved in hot water, filtered, and cooled. Occasionally, excess tartaric acid is added to the lees to increase the saturation of potassium bitartrate in solution. Since the solubility of potassium bitartrate is highly dependent on temperature, the pure salt begins to crystallize out of solution and can be collected via filtering once again. This solubility can also be exploited to produce potassium from Seignette's Salt (also known as Rochelle's Salt or potassium sodium tartrate). Acidification to pH 3.5 with small amounts of hydrochloric acid will precipitate potassium bitartrate."*

   Source: https://en.wikipedia.org/wiki/Potassium_bitartrate

2. "*The pomace, therefore, as soon as produced, is thoroughly dried under a gentle artificial heat, if desired, so that fermentation is entirely prevented. The tartrates which are contained in grape pomace are the ordinary cream of tartar, that is to say, the bitartrate of potassium and small quantities of other soluble tartrates, but the tartrate of calcium is present in even larger quantities, and this is completely insoluble in even hot water, so that by the crude method of extracting the tartrates hitherto practiced, this calcium tartrate remained insoluble and was not extracted from the pomace. By our improved process, this calcium tartrate is first converted into the bitartrate of potassium, and then all the tartrates are extracted from the pomace and completely separated by solution in hot water and are thereafter separated therefrom in the usual way. This process of converting the calcium tartrate is based upon the fact that calcium tartrate is readily decomposed by oxalic acid, the products of this reaction being free tartaric acid and insoluble oxalate of*

calcium, which is precipitated from the solution. The free tartaric acid, as it is produced in connection with the pomace, unites with potassium salts which are normally present therein to form the bitartrate of potassium, or cream of tartar."

Source: ***U.S. Patent 783,524, "Process of Making Cream of Tartar," Hooven & Endemann (1905).***

https://patentimages.storage.googleapis.com/46/ef/6c/b48176964999b0/US783524.pdf

Observe the following excerpts from the USDA's official Technical Evaluation Report on Potassium Acid Tartrate:

- *"Water is the only solvent or reagent used to extract potassium acid tartrate from the sediment. No chemical changes occur during extraction."*

- *"Extracting wine lees with hot water dissolves the potassium acid tartrate. When the filtered extraction solution is cooled, potassium acid tartrate precipitates as very pure crystals (>99.5% pure). No other reagents or solvents are involved in the extraction."*

- *" Evaluation Question #2: Discuss whether the petitioned substance is formulated or manufactured by a chemical process, or created by naturally occurring biological processes (7 U.S.C. § 6502 (21)). Discuss whether the petitioned substance is derived from an agricultural source.*

  As noted in the response to Evaluation Question #1, potassium acid tartrate is present in raw grapes and is created by the naturally occurring reaction of the tartaric acid and potassium present in the grapes. The extraction process to isolate pure potassium acid tartrate from the potassium acid tartrate-containing lees, sediment, and press cake is very simple: mix these by-products with hot water to dissolve the potassium acid tartrate; separate the hot water supernatant from any undissolved residue; cool the supernatant so the potassium acid tartrate forms crystals; isolate the crystals; and dry them. No chemical changes occur during extraction. Nevertheless, potassium acid is classified as synthetic as indicated by its listing at $205.605(b) as an allowed synthetic nonagricultural substance."

Source:
https://www.ams.usda.gov/sites/default/files/media/Potassium%20Acid%20Tartrate%20TR%20Final%2001%2011%2017.pdf

From the above three things become clear:

1. The refinement process does not constitute *istiḥālah*, as there is no substantial change in the substance nor its molecular structure. The same potassium bitartrate crystals remain potassium bitartrate throughout the process; they are simply crushed, recrystallized and ground into a fine powder. In other words, cream of tartar is simply potassium bitartrate in powdered form.

2. There are no traces of the original wine remaining in the final product, cream of tartar.

3. Any doubts regarding ambiguous additives are unfounded, as nothing is essentially added to the potassium bitartrate during the refinement process. Furthermore, even if any additives were to be added , no trace of them remains in the final product.

<u>Molecular Change: Does it Really matter?</u>

The following has been adapted from the work of Dr. *Muḥammad Ḥusayn Anṣār Nadwī* on the issue of consideration of molecular structures in *Shāriʿ* rulings:

"*The example of the first case is vinegar and alcohol. According to science, during the preparation of vinegar from alcohol, a small quantity of alcohol may remain unchanged in the resulting vinegar. However, if the same proportion of alcohol were artificially added to an equivalent quantity of another liquid, such as water or even vinegar, the resulting mixture would be considered najis. Thus, regardless of how strongly a scientist may argue that "the liquids contain the same percentage of alcohol in both cases," the Sharīʿah does not base its ruling merely upon this chemical similarity. Rather, it declares the vinegar to be ṭāhir and the other liquid to be najis.*

Another example of this case is semen (manī) and prostatic fluid (maḏy). According to science, normal human semen contains approximately 25–30% prostatic fluid. In other words, the liquid portion of semen—which also contains fluids from the seminal vesicles and bulbourethral glands—contains a considerable amount of prostatic fluid. Therefore, if a certain quantity of prostatic fluid soils a garment and dries, while four times that quantity of semen soils the same garment and dries, the garment would have absorbed approximately the same amount of prostatic fluid in both cases. Nevertheless, to purify the garment in the latter case, it is sufficient to scrape away the dried substance, whereas in the former case, the affected portion must be washed. Regardless of how strongly one may argue that "the garment has absorbed the same quantity of prostatic fluid in both cases," the Sharīʿah does not base its ruling on this scientific similarity. It considers one case ṭāhir and the other najis.

Thus, two substances may be scientifically similar in their composition while being treated as distinct substances by the Sharīʿah. By the grace of Allah (SWT), we have naṣṣ in the aforementioned cases, which prevents a modernist from claiming that our ʿulamāʾ erred in their ijtihād by declaring one substance ṭāhir and another najis.

The example of the second case is the cooking of an egg. According to science, an egg primarily contains a protein called albumin, which is a water-soluble globular protein. When an egg is boiled or cooked, the albumin undergoes a chemical change known as denaturation, producing a new coagulated substance that is insoluble in water. Scientifically, therefore, a raw egg differs from a cooked egg. Yet the Sharīʿah considers the two to be essentially the same for purposes of its ruling. If a raw egg is ṭāhir, its cooked form is likewise ṭāhir, and if the raw egg were najis, its cooked form would likewise be najis. Thus, regardless of how strongly a scientist may argue that "a cooked egg is chemically different from a raw egg," the Sharīʿah does not regard this chemical difference as sufficient to establish a different legal substance. Rather, it treats both as the same in essence.

Another example of this case is the action of papain, a meat-tenderizing enzyme, on meat. Papain is an enzyme extracted from the latex of the papaya fruit. For centuries, various cultures have used the latex of unripe papaya as a meat tenderizer. This enzyme has the distinctive ability to break the peptide bonds in proteins, thereby breaking them down into their basic building blocks, known as amino acids. Because papain acts upon a variety of proteins, its solution can be applied to raw meat to tenderize it before cooking. Meat consists of various proteins, including collagen, myoglobin, myosin, actin, and other myofibrillar proteins. Since only a relatively small quantity of papain is normally applied to meat, its overall structure remains largely intact even after the enzyme acts upon it.

However, if a large quantity of raw papaya latex were added to meat, it could break down much of the meat and reduce it to a solution containing free amino acids, while leaving behind only a small amount of indigestible material. Similarly, if raw meat were minced, its juices extracted, and a considerable quantity of papain added to those juices and left to act for an extended period, the entire solution could undergo a significant chemical change, ultimately leaving primarily free amino acids and other small-molecular substances.

The process is comparable to what occurs in the formation of gelatin, except that papain can carry the breakdown of the proteins much further. In the case of gelatin, the larger protein fibers of collagen are broken down into smaller protein structures. With papain, however, this breakdown can continue until the basic building blocks of proteins—amino acids—are produced. Therefore, if a considerable quantity of papaya latex were added to the juices of swine meat and allowed to act for several days, the resulting product would, from a scientific and chemical perspective, be vastly different from the original meat juice. Indeed, the chemical difference between the resulting solution and the original meat juice would be far

greater than the difference between collagen and gelatin, even though the general pathway of change is similar in both cases. The distinction lies in the extent to which the process is allowed to proceed: in gelatin, the transformation stops at an earlier stage, whereas with papain, the breakdown may continue much further.

Thus, regardless of how strongly a scientist may argue that "the resulting solution is chemically very different from the original raw-meat juice," the Sharīʿah may nevertheless consider the two to be legally identical for purposes of its ruling. In other words, two substances may be scientifically different in their composition while still being treated as one and the same substance by the Sharīʿah."

Given the above, it becomes clear that similarity or difference in molecular structure is not a criterion in *Sharīʿah* for determining whether a substance is *ṭāhir* or *najis*. Rather, *Sharīʿah* considers the legal identity and relevant characteristics of a substance to declare whether it has gone through *istiḥālah* or not, such as the case of wine and potassium bitartrate (As will be discussed later).

Thus, molecular similarity alone does not necessitate that two substances share the same ruling, nor does molecular difference necessarily entail that they have different rulings.

<u>Some Possible Objections and Answers:</u>

Below are some possible objections, along with their responses:

<u>Objection 1:</u>

The neutralization of potassium and tartaric acid resulting in the formation of potassium bitartrate crystals does not constitute istiḥālah, since the molecular structure of tartaric acid remains unchanged in both wine and potassium bitartrate

<u>Answer:</u>

The molecular formula of tartaric acid is $C_4H_6O_6$, whereas the molecular formula of potassium bitartrate is $C_4H_5KO_6$. In the formation of potassium bitartrate, one hydrogen ion (H^+) from tartaric acid is replaced by a potassium ion (K^+). Thus, although the overall molecular framework remains largely unchanged, the resulting compound is chemically distinct from tartaric acid itself.

Furthermore, as already explained, there is no requirement for a substance to undergo a "molecular reconstruction" in order for it to be deemed *ṭāhir*.

Moreover, this reasoning appears to be inconsistent with how *Sharīʿah* considers the *ʿayn* and *māhiyyah* (essence) of substances. In the examples which the *fuqahāʾ* have cited to explain *istiḥālah*, there is no indication that they considered the chemical composition, molecular structure, or any other scientific analysis of the substances in question. Rather, their discussions revolve around the transformation of the substance itself and the disappearance of its distinguishing characteristics and properties. As mentioned very clearly by *ʿAllāmah Ibn ʿĀbidīn al-Shāmī (raḥimahullāh)*, in his *Radd al-Muḥtār* under this very discussion:

لِأَنَّ الشَّرْعَ رَتَّبَ وَصْفَ النَّجَاسَةِ عَلَى تِلْكَ الْحَقِيقَةِ وَتَنْتَفِي الْحَقِيقَةُ بِانْتِفَاءِ بَعْضِ أَجْزَاءِ مَفْهُومِهَا فَكَيْفَ بِالْكُلِّ؟ فَإِنَّ الْمِلْحَ غَيْرُ الْعَظْمِ وَاللَّحْمِ، فَإِذَا صَارَ مِلْحًا تَرَتَّبَ حُكْمُ الْمِلْحِ

"Because the Sharīʿah attached the attribute of impurity to that particular reality/entity. That reality ceases to exist when some of the constituent elements of its definition cease to exist—so how much more so when the entirety of it ceases to exist? For salt is different from bone and flesh; therefore, when [the latter] becomes salt, the ruling of salt applies to it."

(Radd al-Muḥtār ʿalā al-Durr al-Mukhtār, vol. 2, p. 383, Dār al-Salām edition)

Objection 2:

Cream of tartar remains najis as the underlying derivative of wine, tartaric acid, remains unchanged in the final product

Answer:

To refer to tartaric acid as a "the underlying derivative of wine" is categorically incorrect, as already explained above under Point #3 tartaric acid is not a derivative of wine; rather, it is naturally derived from grapes and is already present in grape juice before fermentation occurs.

Objection 3:

The crystallization of potassium bitartrate is unlike that of wine into vinegar, in which there is a molecular composition

Answer:

There is no doubt that wine and vinegar differ vastly in their molecular structure, but to even compare the two liquids at the molecular level is akin to comparing apples to oranges. Wine is a complex mixture of different chemical compounds whereas vinegar is a dilute solution made primarily of water and roughly 4% to 8% of acetic acid.

Moreover, when examining the oxidation of wine into vinegar, the "underlying tartaric acid structure" remains entirely intact, both in its molecular structure and carbon skeleton.

Observe the following:

1. *"While both tartaric and malic acids can be found in grapes early in the growing season, their behaviour during ripening and winemaking differs. Tartaric acid is synthesised during initial berry cell division and remains stable more or less throughout the ripening process of healthy berries. It is not metabolised during winemaking but can be lost through physiochemical mechanisms like precipitation."*

   Source: https://oeno-one.eu/article/view/7877#:~:text=Two%20of%20them%2C%20tartaric%20acid,present%20in%20some%20fruits%20

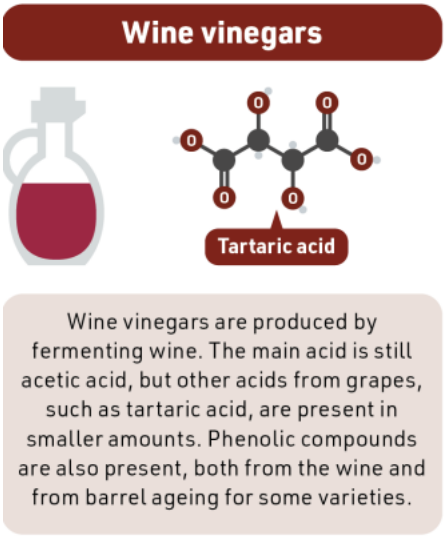
2. *"Beyond acetic acid, different vinegars contain trace amounts of other organic acids. Balsamic vinegar contains tartaric acid from grapes. Apple cider vinegar contains malic acid from apples. Wine vinegars carry traces of tartaric, citric, and succinic acids. These secondary acids contribute to flavor complexity but make up a small fraction of total acidity."*

   Source: https://vomfassusa.com/blogs/gourmet-foods/vinegar-a-deep-dive-into-the-art-of-acidity-and-balance?srsltid=AfmBOoq3EIKWPyHPhiY9U7bec-exZqjIO6lPcGDHJzjA-t3tQjf7Ene5

3. *"In addition to acetic acid (which typically makes up between 5% and 12% of the volume), wine vinegar contains a wide range of other components These compounds originate from the original wine and develop during aging. These include fixed acids (such as tartaric and malic acids), mineral salts (especially potassium), polyphenols and tannins (especially in red wine vinegar), and traces of residual alcohol. It is*

precisely these minor compounds that determine the aromatic profile, color, and complexity of a quality vinegar."

Source: https://www.greatitalianfoodtrade.it/en/aceti/aceto-vino-italiano/

4. 

Source: https://www.compoundchem.com/2023/02/20/vinegar/

5. *"Tartaric acid is resistant to decomposition, and it is seldom attacked by wine microbes. This is why wine makers add tartaric acid to grapes deficient in acidity rather than using a less stable acid such as malic or citric."*

   Source: https://www.homebrewit.com/pages/a-detailed-explanation-of-acids-used-in-wine-making

On the other hand, when tartaric acid undergoes neutralization to form potassium bitartrate, although they may share the same carbon skeleton, they are considered two distinct molecular structures.

If this reasoning were to be applied, it would lead to a clear contradiction of *Sharīʿah* and would result in declaring vinegar made from wine to be *najis* as well. The reason why vinegar is pure is because its composition and characteristics are distinct from those of wine. This ruling of purity applies to vinegar even though vinegar and wine share some common elements.

Consider the following text:

. وجه قول محمد: أن النجاسة لما استحالت وتبدلت أوصافها ومعانيها – خرجت عن كونها نجاسة؛

لأنها اسم لذات موصوفة؛ فتنعدم بانعدام الوصف، وصارت كالخمر إذا تخللت

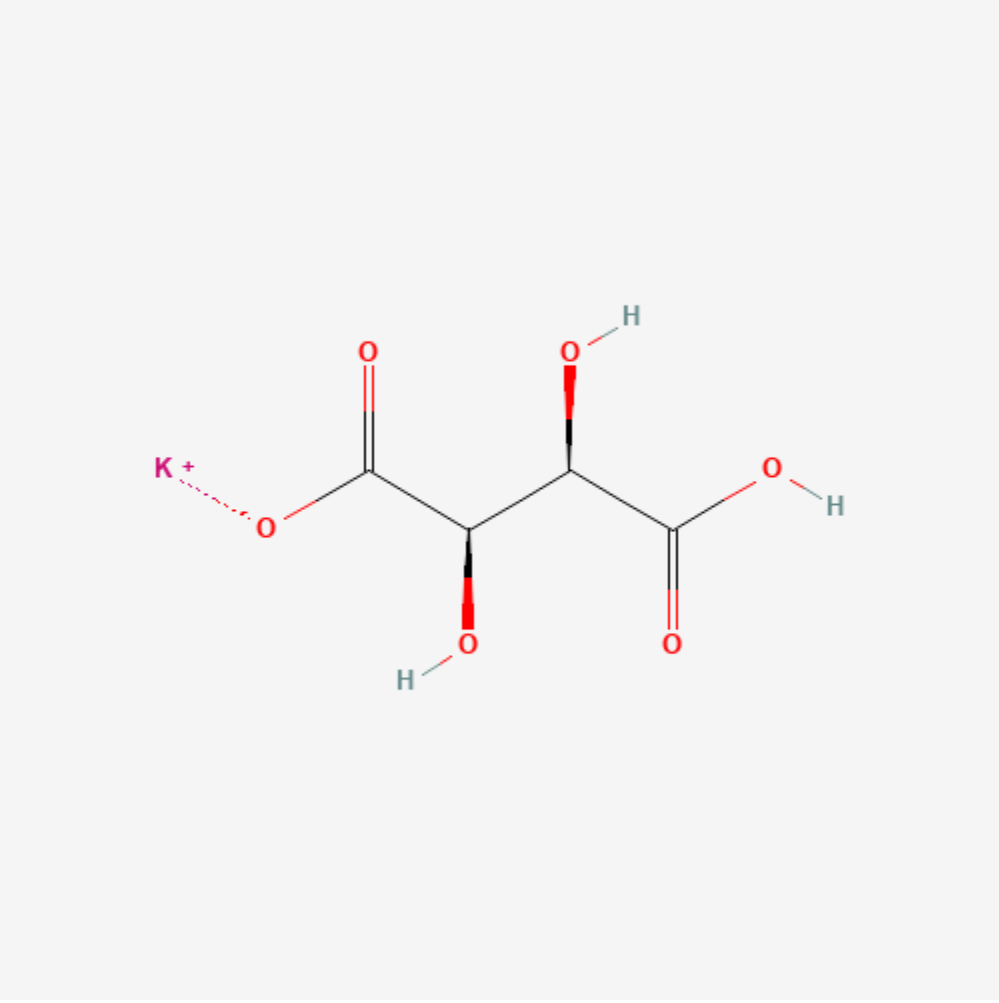
"Imam Muḥammad's reasoning is that when an impure substance undergoes istiḥālah (a complete transformation) and its characteristics and properties change, it ceases to be considered impure, because impurity is a designation for an entity possessing certain characteristics; thus, when those characteristics cease to exist, the impurity likewise ceases to exist. It is therefore analogous to wine when it turns into vinegar."

(*Badāʾiʿ al-Ṣanāʾiʿ fī Tartīb al-Sharāʾiʿ*, vol. 1, pp. 441–442, Dār al-Kutub al-ʿIlmiyyah.)

Furthermore, even if molecular structure and chemistry were to be considered in this regard, wine and potassium bitartrate differ significantly in both their molecular composition and chemical properties. This is not merely a change of state, as in the case of liquid orange juice becoming into frozen orange juice. Rather, it involves both a change of state, wine being a liquid and potassium bitartrate being a crystalline solid, and a significant change in molecular composition, as is evident from the chart below:

Wine	Potassium Bitartrate
A Mixture of Chemical Substances	A Single Chemical Compound
Composed of Water (86%), Ethanol (12%), Glycerol, Higher Alcohol, and Polysaccharides (1%), Organic Acids (0.4%), Polyphenols such as Anthocyanin and Tannins (0.1%), Minerals, Volatile compounds, and other compounds (0.5%).	Molecular Formula : $\mathbf{KC_4H_5O_6}$
Contains organic acids such as tartaric, malic, citric, succinic, and acetic acids.	Only contains the bitartrate ion associated with potassium.
Liquid	Solid Crystalline
Contains Ethanol $\mathbf{(C_2H_5OH)}$	Contains No Ethanol

Top to bottom, molecular structure of potassium bitartrate and molecular structure of wine



The Chemistry of Wine

COMPOUND INTEREST

WINE IS A COMPLEX MIXTURE OF HUNDREDS OF CHEMICAL COMPOUNDS
THAT DEVELOP THROUGH EACH STAGE OF WINEMAKING.

THE WINEMAKING PROCESS



1. PREPARATION
Grapes are harvested and their stems are removed.

2. FERMENTATION
Yeasts convert sugars into alcohol and carbon dioxide in real time.

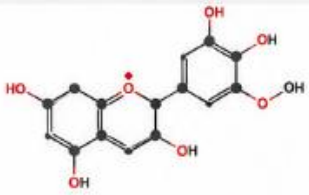
3. PRESSING
Pressing separates the juice from the skins, seeds, and stems.

4. AGEING
Stored in barrels or tanks. Many compounds evolve, softening flavour and aroma over time.

5. BOTTLING
Blended (if needed), clarified, and bottled for various styles.

ANTHOCYANINS

Found in the skins of grapes. As grapes are crushed, anthocyanins extract into the juice and give red wine its purple-red colour. These compounds are polyphenols.



Malvidin-3-glucoside
An anthocyanin



TANNINS

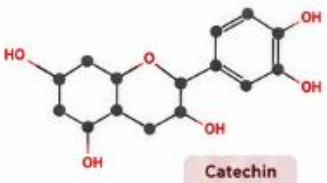
Tannins are polymers of other phenolic compounds. They come from grape skins, seeds, and stems, as well as oak barrels. They contribute to the structure, bitterness, and ageing potential of wine.



Tannin
Example structure

FLAVAN-3-OLS

Present in grape seeds and skins. They contribute to bitterness and astringency in red wines. Levels can range from 10–80 mg/L depending on variety, ripeness, and winemaking.

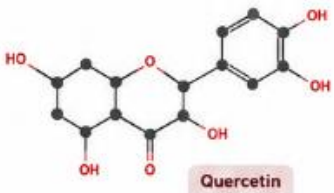


Catechin
A flavan-3-ol

KEY
Carbon
Oxygen
Hydrogen

FLAVONOLS

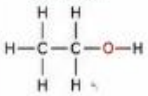
Flavonols enhance the yellow colour of white wines and act as natural antioxidants. They protect against oxidation and have potential health benefits.



Quercetin
A flavonol

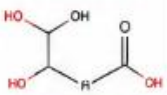
OTHER IMPORTANT COMPOUNDS IN WINE

ALCOHOL



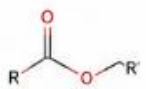
Ethanol
Produced during fermentation; main source of alcohol in wine.

ORGANIC ACIDS



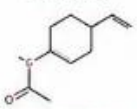
Tartaric Acid
Contributes to acidity, freshness, and stability.

ESTERS



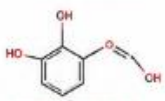
Ethyl Acetate
Provide fruity aromas such as pear, banana, and apple.

TERPENES



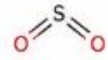
Limonene
Contributes citrus and floral aromas to wine.

PHENOLIC ACIDS



Gallic Acid
Act as antioxidants and contribute to structure.

SULFUR COMPOUNDS



Sulfur Dioxide
Used in small amounts as an antioxidant and preservative.

WINE CHEMISTRY IS COMPLEX – HUNDREDS OF COMPOUNDS WORK TOGETHER
TO CREATE THE COLOURS, AROMAS, FLAVOURS, AND TEXTURES WE ENJOY.

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Conclusion

Potassium bitartrate is a crystalline natural by-product formed through the neutralization of potassium and tartaric acid naturally present in grapes. Its formation can occur through various processes, including fermentation during winemaking, cold stabilization, and exposure to freezing temperatures. The crystals may accumulate on the surfaces of vessels used to store or process wine, such as wine barrels or casks, from which they are collected. Thereafter, they undergo a rigorous purification and refinement process which removes any wine residue and unwanted substances. Finally, these crystals are dried and then crushed to powder to form cream of tartar.

This treatise was an attempt to establish the purity and permissibility of cream of tartar both through the lenses of *fiqh* and chemistry.

May *Allāh Taʿālā* make it a means of enlightenment and benefit for the entire *ummah*. *Āmīn*.

تمت بالخير

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