



Shellac

A FIQHĪ APPRAISAL



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الحمد لله، وصلى الله على سيدنا محمد وآله وصحبه وسلم، وبعد:

1. WHAT IS SHELLAC?

Shellac is a natural gum resin secreted by the lac beetle (*laccifer lacca*, or *tachardia lacca*) which lives on trees in tropical and subtropical regions such as India and south-eastern Asia. Its industrial uses include its use as varnish, floor polish, adhesive and sealing wax. It is used in the food industry as a coating for fruit, chocolate products and sweets, and pharmaceutically in time release capsules for oral medication.

2. FROM WHERE IS LAC SECRETED?

Lac is secreted from an exocrine gland on the body of the lac beetle. Exocrine glands secrete to the outside of the body while endocrine glands secrete into the body. Other substances which are secreted from exocrine glands include silk and beeswax.¹ Unlike honey, lac does not come from the digestive tract. In this respect lac is different from honey: honey is regurgitated by the bee from its honey sac which forms part of its digestive tract.

3. HOW IS SHELLAC PROCESSED?

There are three stages in the production of shellac:

- Harvesting
- Cleansing
- Refining

3.1 Harvesting

The lac beetle lives on trees from whose branches it sucks sap. The female secretes a resin called *lac* which forms a cocoon over the bodies of the insects. The cocoons form a coating on the branches of the tree. Coated branches are cut from the tree and the coating, which consist

¹ See Singh R, *Elements of Entomology*, Chapter 12: *Exocrine and Endocrine Glands*, p. 174, 1st ed, 2006-2007, Rastogi Publications, Meerut UP, India

of both the hardened resin and body parts of dead beetles, is scraped off. The lac on harvested lac-coated branches is called *sticklac*. When the lac is scraped off the branches it is called *grainlac*.

3.2 Cleansing

Since it is the lac resin, and not the insect bodies, that is actually sought, sticklac/grainlac is subjected to two forms of treatment aimed at the removal of insect bodies and other unwanted impurities like twigs and leaves. These two processes are *filtering* and *washing*.

3.2.1 Filtering

There are two methods for the removal of unwanted solid impurities from shellac:

- The *traditional method* of filtering involves placing the sticklac/grainlac in sock-like canvas tubes which are heated over fire. The lac liquefies and drips from the canvas tubes, leaving beetle parts and other impurities behind.
- In the *modern method* insect parts etc. are removed through filtration by means of filter presses equipped with polyethylene filter cloths.

3.2.2 Washing

The next stage is described in one source² as follows:

The sifted resin mixture is put into large jars and stomped by a worker to crush granules and force the red dye from the lac seeds and the insect remains will be freed from the resin. Dye water, scum, and other impurities are then washed away in several rinsings.

The orange or reddish colour of unbleached shellac comes about on account of the dye that is released from the lac seeds. The rinsing washes away most of the dye, but the reddish tint generally proves very difficult to remove. The above source states:

Despite the removal of much of the red dye from the lac seeds in the refining process, shellac remains an orangish solution after processing is complete.

Colourless shellac is obtained through bleaching. The bleaching process involves dissolving the seedlac in an aqueous solution of sodium carbonate, filtering it, bleaching it with a

² <http://www.enotes.com/how-products-encyclopedia/shellac>

dilute solution of sodium hypochlorite, and then precipitating it from the solution by the addition of dilute sulphuric acid. Thereafter it is filtered and washed with water.

At this stage it is called *seedlac*.

3.3 Refining

In the previous stage insect parts have been completely removed from the seedlac.³ The impurities that remain comprise chiefly of wax. Seedlac with 3 - 5% impurities is further subjected to either *heat treatment* or *solvent extraction*.

3.3.1 Heat treatment

Seedlac is melted onto steam-heated grids. The molten lac is forced by hydraulic pressure through a sieve or screen, either of cloth or fine mesh. The filtered shellac is collected and transferred to a steam-heated kettle, which then drops the molten liquid onto rollers. The liquid is squeezed through the rollers and forced into large, thin sheets of shellac. When dry, this shellac sheet is broken into flakes and transported to another area in which the flakes are combined with denatured alcohol to produce the consumer's shellac.⁴

3.3.2 Solvent extraction

Solvent extraction involves the removal of substances from a mixture through preferential dissolution in a suitable solvent.

In this last process, carefully selected and tested crude lac (seedlac) is dissolved in alcohol, preferably ethanol. The batch size of the 10 – 20% solution can be 5000 l or more. The solution is filtered to remove impurities and wax and decolorized by a treatment with activated carbon. The solvent is evaporated and the hot liquid resin drawn to a film. After cooling the shellac breaks into thin flakes. The flakes can be crushed or milled to a fine powder.⁵

Resin that has undergone these processes of refinement is called *shellac*.

³ According to an email communication from C Esterhuysen at Warren Chem Specialities, Killarney Gardens, Cape Town on 15/01/2010.

⁴ <http://www.enotes.com/how-products-encyclopedia/shellac>

⁵ Kharsa DR & Stephenson RA, *Chemical Aspects of Drug Delivery Systems*. 1996, p. 146

3.4 Use in the confectionery industry

Shellac is shipped in the form of flakes or powder. Confectioners and other users dissolve the shellac flakes in ethanol, in a solution of 50 litres of ethanol for 14 kg of shellac flakes.⁶ Small amounts of this solution are added to large quantities of the product intended to be coated with shellac in centrifugally spinning containers.⁷ The removal of ethanol from this solution comes about through spontaneous evaporation of the ethanol.

4. IS IT ḤALĀL TO CONSUME?

The answer to this question requires focus upon 3 aspects of shellac:

- its origin
- the processes of cleansing and refinement
- the use of ethanol

4.1 Origin

Lac is secreted by the lac beetle. Substances discharged by animals may be divided into two categories:

- Substances discharged through the digestive tract, either through the mouth or the rectum. This category includes excreta and urine, and in the case of the bee, honey, which is regurgitated from the honey sac back through the mouth.
- Substances discharged through exocrine glands, such as silk in the silk worm, beeswax in the honey bee, and saliva and sweat in humans.

The former category includes both *ṭāhir* substances, like honey, and *najis* ones, such as excreta, urine and vomit. Substances in the latter category are exclusively *ṭāhir*.

Two forms of *qiyās* are possible here:

- A *qiyās musāwī* (equivalent analogy) upon gland-secreted substances like silk and beeswax, with the common *‘illah* being the manner of secretion.

⁶ Observed during a visit to Tiger Brands' Beacon factory, Mobeni, Durban on 9/12/2009.

⁷ In the case of Beacon's chocolate coated peanuts, 100ml of shellac-ethanol solution was added to 44kg of nuts.

- A *qiyās awlawī* (*a fortiori* analogy) upon honey: if honey is *tāhir* despite originating out of the digestive tract, the same should hold for lac, *a fortiori*.

In terms of its origin, therefore, lac is both *tāhir* and *ḥalāl*.

4.2 Cleansing and refinement

The presence of beetle parts in sticklac and seedlac is undesirable to manufacturers and end-users. It is precisely the desire for a product that is free from beetle parts and other impurities that motivates manufacturers to undertake several processes of cleansing and refinement. What needs to be determined from a *fiqhī* perspective, however, is—

- to what degree the initial presence of beetle parts in sticklac affects the consumability of shellac;
- and to what extent the cleansing and refining processes satisfy the requirement of Sharʿī purification.

4.2.1 Presence of insect parts

The *madhāhib* are unanimous upon the impermissibility to consume insects. Even the *Mālikī* madhhab, which has the widest latitude in dietary matters, does not unrestrictedly deem insects as permissible. The term *ḥasharāt*, commonly translated as “insects”, actually has a wider meaning than the class *insecta* under the phylum *arthropoda*, as can be seen in this quotation:

قال في الموسوعة الفقهية ١٤١/٢: الحشرات قد تطلق على الهوام فقط، وقد تطلق على صغار الدواب كافة مما يطير أو لا يطير، والمراد هنا المعنى الثاني الأعم.

وفي هامشه: ويؤخذ من تاج العروس (مادة همم) أن بعض اللغويين يقول: الهوام هي: الحيات وكل ذي سم يقتل سمه. وأما ما تسم ولا تقتل كالزنبور والعقرب فهي السوام. وأما ما لا تقتل ولا تسم ولكنها تقم في الأرض فهي القوام، كالقنفذ والفأر واليربوع والخنفساء. فمن هنا نعلم أن للحشرات إطلاقاً خاصاً على الهوام، وإطلاقاً عاماً على الدواب الصغار التي تشمل الهوام والسوام والقوام.

What further emphasises how untenable it would be to include an insect such as the lac beetle into the category of what is deemed lawful to the Mālikīs is the Mālikī requirement that *ḥasharāt* that have no flowing blood must be slaughtered. The minuteness of the lac beetle makes slaughter impossible.

قال في الموسوعة الفقهية ١٤٤/٢ في بيان مذهب المالكية: حل أصنافها كلها لمن لا تضره. وإليه ذهب المالكية، لكنهم اشترطوا في الحل تذكيتها: فإن كانت مما ليس له دم سائل ذكيت كما يذكر الجراد... وإن كانت مما له دم سائل ذكيت بقطع الحلقوم والودجين من أمام العنق بنية وتسمية.

Approaching the issue from the angle of the lawfulness to consume insects can therefore only yield a negative result—

- to the Shāfi'īs, Ḥanafīs and Ḥanbalīs on account of *istikhbāth*;
- and to the Mālikīs due to a lack of *tadhkiyah*.

However, that approach is somewhat imprecise in that it fails to consider the real nature of the situation. It is not the lawfulness of consuming insects that is under investigation, but rather the question as to whether the presence of insect parts in a substance that is essentially *tāhir* and *ḥalāl* (as discussed above) would render that substance *ḥārām*.

From this perspective the issues to be considered are the following:

- **Firstly**, are the body parts of dead beetles *najis*?
- **Secondly**, in light of the answer to the above question, what effect would the presence of such body parts have on the *ṭahārah* of lac?
- **Thirdly**, what effect would the presence of such body parts have on the lawfulness to consume the lac?
- **Fourthly**, what would be the consequences of removing the insect parts?

4.2.1.1 Are the body parts of dead insects najis?

The general rule about animals that die on account of anything but Shar'ī slaughter is that their bodies become *najis*. Dead bodies of such animals are referred to as *maytah*. The lac beetle, however, belongs to a group of animals categorised by the fuqahā as “not having flowing blood.”

Opinions differ on the *tahārah* status of the dead bodies of such animals.

- To the majority of the fuqahā—the Ḥanafīs, Mālikīs, Ḥanbalīs and some Shāfi‘īs—the bodies of such animals are *tāhir*.

قال المرغيناني في الهداية ٢٢/١:

وموت ما ليس له نفس سائلة في الماء لا ينجسه، كالبق والذباب والزناير والعقرب ونحوها.

قال العيني في البناية شرح الهداية ٣٣٦/١:

(ونحوها) مثل القراد والجراد والخنفساء والنحل والنمل والصراصر والجعلان وبنات وردان وحمار قبان والبرغوث والقمل... وهذه الأشياء طاهرة عندنا، فلا تنجس بالموت.

جاء في مختصر خليل المطبوع على هامش حاشية الدسوقي ٤٨/١:

(الظاهر ميت ما) أي حيوان بري (لا دم له) أي ذاتي كعقرب وذباب وخنافس وبنات وردان.

وفي الإنصاف ٣٣٨/١ للمرداوي:

(قوله: وما لا نفس له سائلة) يعني لا ينجس بالموت إذا لم يتولد من النجاسة وهذا المذهب، وعليه جماهير الأصحاب... (قوله: كالذباب ونحوه) فنحو الذباب: البق والخنافس والعقارب والزناير والسرطان والقمل والبراغيث والنحل والنمل والدود والصراصير والجعل ونحو ذلك.

- The carried opinion of the Shāfi‘ī madhhab is that the bodies of bloodless animals are *najis*.

قال في تحفة المحتاج ٩٢/١:

وقيس بالذباب غيره من كل ما ليس فيه دم متعفن وإن لم يعم وقوعه، لأن عدم الدم المتعفن يقتضي

خفة النجاسة، بل طهارتها عند جماعة كالقفال.

وقال النووي في شرح المهذب ١/١٨١:

وهذان القولان السابقان إنما هما في نجاسة الماء بموت هذا الحيوان. أما الحيوان نفسه ففيه طريقان:

أحدهما: أن في نجاسته القولين: إن قلنا نجس نجس الماء، وإلا فلا

والثاني: القطع بنجاسة الحيوان. وبهذا قطع العراقيون وغيرهم. وهو الصحيح لأنه من جملة الميتات.

ومذهب مالك وأبي حنيفة أنه لا ينجس بالموت.

4.2.1.2 How does the presence of insect parts affect the *tahārah* of *lac*?

Notwithstanding the above difference of opinion, the madhāhib concur that the presence in liquid of dead insects that do not have flowing blood does not render that liquid *najis*.

● قال في الاختيار ١٥/١ من كتب الحنفية:

(وكذا ما ليس له نفس سائلة كالذباب والبعوض والبق) إذا مات في المائع لا يفسده، لقوله عليه الصلاة والسلام: "إذا وقع الذباب في طعام أحدكم فامقلوه ثم انقلوه" الحديث، وأنه يموت بالمقل في الطعام لا سيما الحار منه. ولو كان موته ينجس الطعام لما أمر به.

● جاء في حاشية الدسوقي ٤٨/١ من كتب المالكية:

واعلم أيضا أنه لا يلزم من الحكم بطهارة ميتة ما لا نفس له سائلة أنه يؤكل بغير ذكاة، لقوله: وافتقر نحو الجراد لها بما يموت به. وحيثئذ: فإذا وقع ذلم الحيوان في طعام وكان حيا فإنه لا يؤكل مع الطعام إلا إذا نوى ذكاته بأكله، كان الطعام أقل منه أو كان أكثر منه أو كان مساويا له، تميز عن الطعام أم لا. وأما إن وقع في طعام ومات فيه: فإن كان الطعام متميزا عنه أكل الطعام وحده، كان أقل من الطعام أو أكثر منه أو مساويا له. وإن لم يتميز عن الطعام واختلط به: فإن كان أقل من الطعام أكل هو والطعام؛ وإن كان أكثر من الطعام أو مساويا له لم يؤكل؛ فإن شك في كونه أقل من الطعام أو لا أكل مع الطعام لأن الطعام لا يطرح بالشك... وقال عبد الوهاب: إذا وقع ما لا

نفس له سائلة في طعام ومات فيه أو كان حيا جاز أكله مطلقا، تميز عن الطعام أم لا، كان أكثر من الطعام أو مساويا له أو أقل منه. وقد بنى ذم على مذهبه من أن ما لا نفس له سائلة لا يفتقر لذكاة. وهذا كله في الواقع في الطعام. وأما المتخلق منه كسوس الفاكهة ودود المش والجن فإنه يجوز أكله مع الطعام مطلقا حيا وميتا، كان قدر الطعام أو أقل منه أو أكثر، ولا يفتقر لذكاة كما قاله ابن الحاجب وقبله شراحه ونقل نحوه عن اللخمي. وهذا إذا لم يتميز عن الطعام، فإن تميز عنه فلا بد من ذكاته.

● وفي تحفة المحتاج ١/٩٠-٩١ من كتب الشافعية:

(ويستثنى) مما ينجس قليل الماء الملحق به كثير غيره وقليله بملاقاته له... (ميتة لا دم لها... سائل) ... كذباب وبعوض وقمل وبراغيث وخنافس وبق وعقرب ووزغ وبنات وردان وزنبور وسام أبرص... (فلا تنجس) رطبا (مائعا) كان أو غيره كثوب... بملاقاتها له إذا لم تغيره (على المشهور) قال ابن قاسم العبادي في حاشيته: (قوله: إذا لم تغيره) فإن غيرته ينجس، فإن زال التغير فهل تعود الطهارة، لأن هذه النجاسة لا تنجس بمجرد الملاقة بل بشرط التغير وقد زال؟ أو لا تعود لأن القليل حيث ينجس لا يظهر بدون الكثرة؟ فيه نظر، والثاني هو ظاهر كلامهم، فليتأمل.

وتعقبه الشرواني في حاشيته قائلا: ومال الشارح [يعني ابن حجر] في شرح بافضل إلى عود الطهارة بزوال التغير. قال كردي في حاشيته: وارتضاه في شرحي الإرشاد. وعبارة فتح الجواد: الأقرب عود الطهارة.

وقال ابن قاسم أيضا: حيث لم يتنجس المائع بالميتة المذكورة لم يجز أكلها معه كما سيأتي في الأطعمة، لكنه مشكل في نمل اختلط بعسل وشق تخليصه.

وكلامه عن النمل الواقع في العسل في الصيد والذبائح من التحفة ٣١٨/٩ كالاتي: ولو وقع في عسل نمل وطبخ جاز أكله، أو في لحم فلا، لسهولة تنقيته، كذا جزم به غير واحد، وفيه نظر ظاهر، إذ العلة إن كانت الاستهلاك لم يتضح الفرق مع علمه مما يأتي في نحو الذبابة؛ أو غيره فغايبته أنه ميتة لا دم لها سائل وهي لا يحل أكلها مع ما ماتت فيه وإن لم تنجسه. نعم أفتى بعضهم بأنه إن تعذر تخليصه ولم يظن منه ضررا حل أكله معه؛ أو في حار نحو ذبابة أو قطعة لحم آدمي ونهت واستهلكت فيه لم يحرم كما يأتي.

● وفي الإنصاف ٣٣٨/١ من كتب الحنابلة:

(قوله: وما لا نفس له سائلة) يعني لا ينجس بالموت إذا لم يتولد من النجاسة وهذا المذهب، وعليه جماهير الأصحاب... فعلى المذهب أيضا: لا يكره ما مات فيه... وعلى المذهب أيضا: لا ينجس ما مات فيه على الصحيح... (قوله: كالذباب ونحوه) فنحو الذباب: البق والخناسف والعقارب والزنابير والسرطان والقمل والراغيث والنحل والنمل والدود والصراصير والجعل ونحو ذلك.

4.2.1.3 How does the presence of insect parts affect the lawfulness of consuming lac?

Theoretically, lac may be consumed either—

- together with the body parts of insects;
- or after the removal of such parts.

The quotations above reveal the application of the rule of 'afw (exemption) by the various madhāhib, to various degrees. All the madhāhib concur that the substance in which the dead bodies are found (lac in this case) remains both *tāhir* and, in principle, *halāl* for consumption. As for the dead bodies themselves, the Mālikī madhhab the Shāfi'ī madhhab, in differing degrees, allow for the consumption of the dead bodies of insects within an edible substance.

In the case of shellac, however, what makes it unnecessary to explore the consumability of the body parts of dead insects is the fact that the cleansing and refinement processes entail the comprehensive removal of insect body parts.

4.2.1.4 What are the consequences of removing the insect parts?

Considering that shellac is—

- firstly, *tāhir* in origin
- and secondly, it is not polluted by the presence of dead insect body parts

the removal of those parts can only emphasise *tāhir* and *ḥalāl* status of shellac in principle. This removal of insect parts is achieved without any assimilation of insect parts, i.e. without blending the two substances (insect parts and lac) into one.

4.2.2 The non-removal of insect dye

There is, however, one area in which assimilation does occur, and that is where the dye released from crushed insect bodies remains behind in the lac despite filtering and washing, giving shellac its characteristic reddish tint.

Worthy of note in this regard is the fact that what remains behind is a colour, and that the removal of this colour entails considerable difficulty, having already withstood several washings. All four madhāhib concur that when the actual *najāsah* has been removed but its colour remains, and the removal of that colour is very difficult or impossible, the presence of that colour will be disregarded in terms of the rule of *'afw*, or overlooking.

قال في اللباب شرح مختصر القدوري ٥٣/١ ن كتاب السادة الحنفية:



(قوله: ولا يشترط زوال لون وريح عسرا) أي بل يغتفر بقاء ذلك في الثوب لا في الغسالة. ولا يجب أشنان ونحوه كما في ح، ولا تسخين الماء كما في عقب لأجل زوال لون النجاسة أو ريحها المتعسرين من الثوب. وذلك لطهارة المحل، لا أنه نجس معف عنه كما قال شيخنا.

وفي تحفة المحتاج شرح المنهاج ٣١٨/١ من كتب ساداتنا الشافعية:

(ولا يضر) في الحكم بطهر المحل حقيقة (بقاء لون أو ريح... عسر زواله)

وفي حاشية الشرواني عليه: (قوله: في الحكم بطهر المحل حقيقة) أي لا أنه نجس معفو عنه، حتى لو أصابه بلل لم يتنجس، إذا لا معنى للغسل إلا الطهارة. والأثر الباقي شبيه بما يشق الاحتراز عنه — نهاية — أي وهو لا ينجس. ع ش

وفي كشف القناع ١٧٠/١ من كتب الشادة الحنابلة:

(ولا يضر بقاء لون) النجاسة (أو ريحها أو هما) أي اللون والريح (عجزا) عن إزالتها... (ويطهر) المحل مع بقاء أحدهما.

4.3 The use of ethanol in dissolution

The use of ethanol in the manufacture and use of shellac occurs at least twice:

- once during the solvent extraction stage of processing;
- and again when manufacturers in the confectionery industry dissolve shellac flakes for use in their products.

4.3.1 Type of ethanol used

The alcohol used in solvent extraction as well as in the dissolution of the final shellac product is *denatured ethanol*. Denatured ethanol is ethanol that has been made unfit for human consumption through the addition of toxins, such as methanol, naphtha and pyridine, or bittering agents such as denatonium benzoate. The addition of toxins and bittering agents,

however, does not remove the ability of ethanol to intoxicate; it only adds toxicity and a bitter taste to its existing attributes.

As such, if *khamr* is to be considered any liquid that has the ability to intoxicate, then denatured ethanol has to be regarded as *khamr*. That it can kill is an additional and coincidental attribute that does not eliminate the attribute of intoxication.

However, the question as to whether or not ethanol would be considered *ḥarām* and *najis* has to be answered in light of the source from which it is fermented. Ethanol may be obtained from a number of sources. If obtained through the fermentation of grapes or dates, it will be considered *najis* in all four madhāhib. If fermented from a source other than grapes or dates, it will be considered *tāhir* in the view of Imām Abū Ḥanīfah and his pupil Imām Abū Yūsuf. His other pupil, Imām Muḥammad ibn al-Ḥasan, concurs with the rest of the fuqahā that it will be *najis*.

Ḥanafī fuqahā have traditionally differed in assigning preference between these two views. Some, like al-Maḥbūbī, al-Nasafī, al-Mawṣilī and Ṣadr al-Sharī‘ah, assigned preference to the view of the Shaykhayn, Abū Ḥanīfah and Abū Yūsuf. Others, like Abu l-Layth al-Samarqandī, al-‘Aynī, and the authors of *al-Kifāyah*, *al-Tanwīr*, *al-Multaqā*, *al-Mawāhibī*, *al-Nihāyah*, *al-Mi‘rāj*, *Sharḥ al-Majma‘* and *Sharḥ Durar al-Biḥār*, motivated by potential and actual abuse of the former position, assigned preference to the view of Imām Muḥammad.⁸

Notwithstanding the above, the increased industrial use of ethanol in modern times has prompted a number of contemporary Ḥanafī scholars to shift back to the position of Imām Abū Ḥanīfah and Imām Abū Yūsuf.⁹ In terms of this view, the use of ethanol from a source other than grapes and dates in a product, will not negatively affect the *ṭahārah* or consumability of the product.¹⁰

For the rest of the fuqahā, it is not to the *ṭahārah* or consumability of ethanol that one should look for a solution to this problem, but rather to the manner in which its removal from the product comes about.

⁸ Al-Maydānī, *al-Lubāb* vol. 3 p. 215

⁹ See, for example, Shaykh ‘Abd al-Fattah Abū Ghuddah’s annotation, quoting Shaykh Zāhid al-Kawtharī, on Mullā ‘Alī al-Qarī’s *Fath Bāb al-‘Ināyah*; Muftī Taqī ‘Uthmānī, *Takmilat Fath al-Mulhim*, vol. 3 p. 340, and Muftī Ebrahim Desai, <http://www.askimam.org/fatwa/fatwa.php?askid=4bef1f238544ba5d8b688bde180241d1>

¹⁰ The ethanol used by Beacon was noted during inspection to be produced by Illovo. According to its website, Illovo produces ethanol from molasses. http://www.illovo.co.za/Our_Products/Downstream_Products.aspx

4.3.2 Manner of ethanol removal

There is general concurrence between the four madāhib that when wine turns into vinegar spontaneously, without any human inducement. With the exception of a contrary view attributed to the Mālikī jurist Saḥnūn, this is the view of all the fuqahā of the Ummah.¹¹

What happens during a spontaneous conversion of wine to vinegar is that ethanol ($\text{CH}_3\text{CH}_2\text{OH}$) combines with oxygen (O_2) to yield acetic acid (CH_3COOH) and water (H_2O). During this process of oxidation all the ingredients remain within the substance; all that happens is that they bond in a somewhat different chemical pattern. The result of the new chemical structure is that the factor of intoxication (*iskār*) is effectively removed. With this factor removed, the rules pertaining to purity and consumption also undergo a change: what was *najis* becomes *tāhir*, and what was *ḥarām* to consume becomes *ḥalāl*.

In the production and use of shellac, the use of ethanol is not accompanied by a similar alternative chemical bonding. In both solvent extraction and dissolution of flakes, ethanol is removed from the solution through spontaneous evaporation. Ethanol is known to be a very volatile liquid: it tends to vaporize quite rapidly. It was observed¹² that the ethanol-shellac solution, once added to chocolate products being panned centrifugally, emits a strong smell of wine that gradually decreases with the passage of time, until it disappears as the shellac coating hardens and dries. This hardening and drying of the shellac is due to the loss of ethanol.

We are thus faced with two parallel processes:

- the *oxidation* of ethanol
- and the *evaporation* of ethanol.

In the most important ways these two processes exhibit a great degree of similarity, as shown in this table:

OXIDATION	EVAPORATION
Spontaneous	Spontaneous
Nullifies <i>iskār</i>	Nullifies <i>iskār</i>

¹¹ *Al-Majmū' Sharh*

¹² during the site visit to the Beacon factory on 9/12/2009

Moreover, there is one aspect on account of which evaporation would appear to be a stronger and more effective factor for nullifying *iskār* than oxidation: Oxidation only leads to a new chemical arrangement between ethanol and oxygen, while in evaporation ethanol effectively departs from the substance. Whatever applies to oxidation must therefore apply to evaporation *bi l-awlā*, or *a fortiori*.

It might be contended that evaporation leaves a minuscule residue of ethanol. The response to this contention is that the oxidation of ethanol that produces vinegar also a small ethanol residue. The residual ethanol content for a few types of vinegars is given in the following table:¹³

VINEGAR	ETHANOL (% v/v)
Cider vinegar	0.03
Wine vinegar	0.05 – 0.3
Rice vinegar	0.68
Cashew vinegar	0.13
Coconut water vinegar	0.42
Mango vinegar	0.35
Pineapple vinegar	0.67

¹³Giudici P & Solieri L, *Vinegars of the World*, p. 14, Springer, Milan 2009

5. CONCLUSION

- 5.1 Shellac derives from a pure source: the lac glands of the lac beetle.
- 5.2 In the processing of shellac, the lac remains uncontaminated by insect parts because the death of bloodless animals in a liquid does not contaminate that liquid according to all four madhāhib.
- 5.3 Also, such insect parts are essentially *ṭāhir* according to the Ḥanafīs, Mālikīs, Ḥanbalīs and some Shāfi'īs.
- 5.4 Even if insect parts are deemed *najis*, as is the Shāfi'ī view, this fact is of little consequence because insect parts are filtered out early in the process.
- 5.5 The possibility of consuming insects does not arise at all due to the early removal of insect parts through filtering.
- 5.6 If the ethanol used to dissolve shellac is fermented from a source other than grapes or dates, it is *ṭāhir* and *ḥalāl* according to Imām Abū Ḥanīfah and Imām Abū Yūsuf.
- 5.7 In terms of the majority view ethanol is *najis* and *ḥarām*, but its disappearance from the solution through spontaneous evaporation is equatable, with greater force, to the spontaneous oxidation of ethanol through which wine which is *najis* and *ḥarām* becomes *ṭāhir* and *ḥalāl*, virtually by consensus.

It is therefore concluded that shellac is *ṭāhir* and *ḥalāl*.