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Medicinal benefits of Lac described in Unani Literature-An Overview

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ABSTRACT

Lac (*Laccifer lacca*) is an Indian animal origin drug. In *Unani* medicine Lac is known as *Luk* (Arabic word). Its medicinal properties are well advocated in unani literature. That's why its use for various ailments is commonly prevailed among unani fraternity since centuries. This drug is very famous among unani practitioner for its anti-obesity effects. Various *Unani* medicine formulations (compound drugs) are having Lac as a chief constituent are in market. One of its most famous and acceptable formulation "*Safoofe muhazzil*" is being prescribed profoundly to counter obesity. *Unani* Scholars like Ibn Sina (Avicenna), Razi, Ibn Rushd, Rabban Tabri, Hakeem Abdul Hakeem, Najmul Ghani, Jurjani and Kabeeruddin etc., wrote extensively about the medicinal use of Lac for various diseases in their respective books and treatises. Apart from *Unani* System of Medicine lac is also being used as drug in other complementary and alternative medicines (CAM) system especially in Indian system of medicine namely *Ayurveda* and *Siddha*.

Keywords: Lac; *Laccifer lacca*; *Luk*; *Luk Maghsool*; *Unani* medicine; Medicinal Plants.

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INTRODUCTION

Lac is a resinous secretion from a scale insect called Lac Insect (*Laccifer lacca Kerr.*) as a protective covering that inhabits on *Ber* (*Ziziphus marutiana*), *Palas* (*Butea monosperma syn. frondosa*) and *Kusum* (*Schleichera oleosa*). Shellac that is the final product after processing is widely used in confectionary, food products, pharmaceuticals, cosmetics, paints, varnishes etc.¹

Lac is an ingredient having multiple industrial applications. It is one of the most valuable gifts of Nature to man. It is unique as it is the only resin of animal origin, being actually the secretion of a tiny insect, *Laccifer lacca Kerr.* The resin so obtained after processing the raw Lac (Stick Lac) comprised of a natural raw material with exceptional environmentally compatible properties, which is biodegradable and generally recognized as physiologically safe.²

Lac is only known natural commercial resin of animal origin. It is the hardened resin secreted by tiny lac insects belonging to a bug family. To produce 1 kg of lac resin, around 300,000 insects lose their life. The lac insects yields resin, lac dye and lac wax. Application of these products has been changing with time. Lac resin, dye etc. still find extensive use in Ayurveda and Siddha systems of medicine.³

Historical Background

It is remarkable that even thousands of years back, people used to collect or regularly grow and put lac to diverse uses. It is, however, difficult to conjecture exactly when and how it was first exploited for utility purposes. To some extent lac can be dated as follows.

Verse 5 of the 5th volume of the ancient Hindu scriptures, the Atharva Veda (1500 - 1200 BC) is titled Lakhsa and gives a brief account of the lac insect and the medicinal properties of lac. Atharva Veda, Wisdom of Ancient Truth- clearly says that both lac as well as lac dye served as effective and valuable medicine. The Veda reports that an extract of lac was widely used on open wounds for quick healing and tissue regeneration. Use of lac in joining up of broken bones was also common. The *Veda* finally indicates slurry of lac paste in water mixed with ghee and milk was commonly taken orally by sick or wounded persons to get back health. Thus this valuable old manuscript indicates that lac dye was not only safe enough to be used on open wounds but was also taken orally quite often to recoup health and vigor. In the same source, mention is made of a decoction, lakshadi tail, or 'lac oil', said to be effective in curing chronic fevers and rheumatism.²

It is known from Herodotus that the explorer, Scylax, was sent by the Persian king, Darius I (in about 515 BC), to explore the course of the Indus River. In his writings, the Periplus, Scylax was

the first western explorer to describe ancient India, wherein, mention was made of *Lakhos chromatinos* or lac dye. An 8th century AD specimen of lac (*Shi-Ko*) is still preserved in the *Shoso-In* (Imperial Warehouse) at Nara, Japan. Pliny's Natural History (77 AD) refers to electrone (*ber*) trees, which decked the Hypobus (Ganges) river in the Indian sub continent.²

An article on lac by 'Chang Po' as far back as 320 A.D., and Li Shih-Chen sums up information collected from various sources. Lac is the product of Nan-Fan (Indo-China). It is dark-red-brown in colour, with the texture resembling an ore, hence the name 'dark-red-brown ore'. It is also collected attached to branches, and called 'red-brown twig'.²

Unani and Arab (700-1200 AD) physicians wrote about the medicinal properties of *Luk* in their books. Basically *Luk* is Indian origin drug, so they were confused about the exact source and wrongly described it as plant origin drug, but were well versed with its medicinal properties and uses. All the great Unani physicians like Zakaria Razi, Majoosi, Ibn Sina, Rabban Tabri, Ibn Rushd, Ibn Bitar, Ibrahim Al Maghrabi, Hakeem Abdul Haqem, Najmul Ghani, Jurjani and Kabeeruddin indicate extensively the medicinal use of *Luk* for various diseases in their respective books and treatises. Abu Hanifa also recommends its use as a medicine. The Ain-i-Akbari of Abu Fazal (1590) gives detailed procedures for the use of lac varnishes on door screens of public buildings during the Mughal rule in India.²

In the 16th century, the use of lac in sealing compositions was introduced in Europe, by Spanish merchants who carried on overseas trade with India. This practically "sealed" the fate of lac resin for the preparation of sealing waxes, for which it is popular even today, although presently, few formulations of sealing wax actually contain the lac resin *per se*. Father Tachard (1709), a Jesuit priest stationed in India, first reported that a kind of "ant" on the branches of certain Indian trees left behind a secretion, which hardened on exposure to air and sun. However, James Kerr (1781) first described the Indian lac insect scientifically. In 1895, Emil Berliner, a German immigrant to the US, perfected the first shellac moulded gramophone record, which boosted the demand of lac for nearly half a century. These records vastly improved the sound quality, were more durable and could be mass produced, in comparison to the earlier metal cylinders or cardboard ones coated with wax of Edison's time. Gramophone records became obsolete in the 1980s, first by the advent of the cassette player, followed by CDs and DVDs.²

Etymology of Lac^{4,5,6}

The word lac is noun meaning a resinous substance secreted as a protective covering by the lac insect, used to make varnish, shellac, etc and it is thought to origin from Portuguese *laca*, from

Persian لاک (*lāk*), from Hindi लाख (*lākh*) from Sanskrit लक्ष्ण (*lākshā*), Urdu لاکھ (*lākh*). The English word lac synonyms *Lakh* in Hindi which itself is derivative of Sanskrit word *Laksh* meaning a *lakh* or hundred thousand. It would appear that Vedic people knew that the lac is obtained from numerous insects.

Vernaculars

Lac is known by different names in different parts of the world including the Indian sub continent.

Arabic	:	Luk ^{7,8}
Bengali	:	Gala ⁶
English	:	Lac ^{6,9,10}
Gujarati	:	Lak ⁶
Hindi	:	Lakh ^{6,7,9,10}
Persian	:	Laak ⁹
Portuguese	:	Laca ⁶
Sanskrit	:	Laksha ^{6,10}
Sindhi	:	Joua ⁸
Telugu	:	Kommolakka, lakka ⁶
Tamil	:	Komburrki ⁶
Malayalam	:	Arakku, Ambalu ⁶

Common Names

Goma Laca, Gommelaque, Lac, Lacca¹⁰

Scientific Classification-Lac Insect Taxonomy^{3,6}

The first scientific account of the lac insect was given by J. Kerr in 1782 which was published in Philosophical Transaction of Royal Society of London (Vol. 71, pp.374-382). The first scientific name given to it was *Tachardia lacca* following the name of French Missionary Father 'Tachardia'. It was later changed to *Laccifer lacca* Kerr. The other name given to it has been *Kerria lac* Kerr (1782), *Coccus lacca* Kerr (1782), *Coccus ficus* Fabricius (1787), *Chermes lacca* Rox Burgh (1791), *Carteria lacca* Signoret (1874), *Lakshad iaindica* Mahdihassan (1923), *Tachardia lacca* Chamberlin(1923), *Laccifer lacca* Cockerell (1924). Presently lac scientifically classified as:

Kingdom	:	Animalia
Phylum	:	Arthropoda

Class	:	Insecta
Order	:	Hemiptera
Super family	:	Coccoidea
Family	:	Lacciferidae
Genus	:	<i>Laccifer</i>
Species	:	<i>L. lacca</i>
Binomial name	:	<i>Laccifer lacca</i> Kerr

Description³

Lac insect belongs to super family Coccoidea which includes all scale insects. Scale insect is a common name for about 2000 insect species found all over the world. Scale insects range from almost microscopic size to more than 2.5 cm. These insects attach themselves in great numbers to plants. The mouth part of these insects is piercing and sucking type. They can be very destructive to tree-stunting or killing twigs and branches by draining the sap.

There are six genera of lac insects, out of which only five secrete lac, and only one, i.e. *Laccifer* secretes recoverable or commercial lac. The commonest and most widely occurring species of lac insect in India is *Laccifer lacca* Kerr which produces the bulk of commercial lac. Lac insect of South East Asia is referred to as *Kerria chinensis*.

Distribution³

Since the lac insects thrive and feed on certain species of the tropical trees, it is found distributed in South-East Asian countries. Lac is currently produced in India, Myanmar, Thailand, Malaya, Lao and Yuan province of China. India and Thailand are main areas in the world, while India has prime position in relation to lac production. Lac cultivation is introduced into Thailand from India.

Over 90% of Indian lac production comes from the states of Jharkhand, Bihar, West Bengal, Madhya Pradesh, Chattisgarh, Eastern Maharashtra and northern Orissa. Some pockets of lac cultivation also exist in Andhra Pradesh, Punjab, Rajasthan, Mysore, Gujarat, and few districts of Uttar Pradesh (UP).

Some of the Important Host Trees of Lac^{3,6}

Lac insects thrive on twigs of certain plant species (host plants), suck their sap, and grow all the while secreting resin from their bodies. About 113 varieties of host plants are mentioned as lac host plant. Out of which the followings are very common in India:

1. *Butea monosperma* (Palas)
2. *Zizyphus spp* (Ber)

3. *Schleichera oleosa* (Kusum)
4. *Acacia catechu* (Khair)
5. *Acacia arabica* (Babul)
6. *Acacia auriculiformis* (Akashmani)
7. *Zizyphus xylopyrus* (Khatber- grown in part of M.P. & U.P.)
8. *Shorea talura* (Sal grown in mysore)
9. *Cajanus cajan* (Pigeon-pea or Arhar)
10. *Grewia teliaefolia* (Dhaman preferred in Assam)
11. *Albizia lebbek* (Siris/Gulwang)
12. *Flemingia macrophylla* (Bholia)
13. *Ficus benghalensis* (Bargad)
14. *Ficus religiosa* (Peepal)

Composition^{6,11,12}

- I. Resin (Hydroxyl acid derivatives) – 70-80%
 - a. Aleuratic acid (trihydroxypalmitic acid, C₁₅H₃₂O₅)
 - b. Shellolic acid (dihydroxy hydroaromatic acid, C₁₅H₂₀O₆)
 - c. Kerrolic acid (tetrahydroxy-hexadecanoic acid, C₁₆H₃₂O₆)
 - d. Butolic acid (monohydroxy-pentadecanoic acid, C₁₅H₃₀O₃)
- II. Colouring matter - 1-2%
 - a. laccaic acid- (hydroxy anthraquinone carboxylic acid, C₂₀H₁₄O₁₀)
- III. Sugar, protein & soluble salt -2-4%
- IV. Wax (Shellac wax) - 4-6%
- V. Sand, woody matter & insect bodies & other extraneous matter – 8-12%
- VI. Volatile oil in traces

Standards of Lac

- A. Solubility^{6, 11,13}
 - Soluble in alcohol, ether, benzene and petroleum ether
 - Sparingly soluble in oil of turpentine
 - Soluble in aqueous solution of ethanol amines, alkalies and borax with slight purple colour
 - Insoluble in water
- B. Melting point- 72-82 °C¹³

- C. Density -1.035 - 1.1140¹³
- D. Saponification value- 185-210¹³
- E. Iodine value- 10-18¹³
- F. Acid value- 55-70¹⁴

Utilization^{2,3,6,11,13}

Lac is one of the most versatile natural resinous materials. It has a unique combination of properties which renders it useful for a variety of applications in the plastics, electrical, adhesive, leather, wood finishing, hat manufacturing and other industries. It is thermoplastic; it is soluble in alcohol and weak alkalis, and lac films are resilient, possess high scratch-hardness, good adhesion and electrical insulation.

Gramophone Industry:

The compositions used for manufacturing gramophone records generally contain 25-30% shellac.

Electrical Industry:

Because of its excellent electrical insulation properties, shellac is used in the manufacture of numerous electrical goods. It is mainly used as a resinous binder in the manufacture of composite moulded insulation materials. It is also used in polishes, finishes, lacquers for protective and decorative purposes and other uses e.g., laminated paper boards and tubes, laminated sheet and moulded mica, for glazing coffee beans, under coats and enamels and for preserving archaeological and zoological specimen.

Some other minor but important uses of lac are in the manufacture of the following:

Glazed paper, Medicines, Nail Polish, Dental Compositions, Bangle making, Jewellery fillings, Optical frames, Printing Inks, Pharmaceutical and lac dye was formerly employed extensively for dyeing silk, wool and leather; it has now been largely replaced by the more versatile synthetic dyestuffs.

Description of Lac in Unani Medicine^{8,15,16}

Early *Unani* physicians especially Arabs had little knowledge about lac source and thought it to be a plant secretion or exudates. The misunderstanding arose due to fact that lac did not grow on these area. But they all were well acquainted with its medicinal values. *Unani* physicians of later age especially of Indian subcontinent correct the misunderstanding of ancient Greco-Roman and Arabs scholars and describe Lac correctly, they mentioned it an animal origin drugs and named as "*Luk*" which is obtained from small insect which survive and flourish on tree leaves especially *Pepal, Ber, Hitta, Pakhri*.

Temperament (*Mizaj*): in unani medicine every drugs action depends on its temperament. Broadly four types of temperament are described namely, Hot-Dry, Hot-Wet, Cold-Dry and Cold-Wet with their degree (intensity) ranging upto four. Majority of Scholars wrote Lac is a Hot-Dry drug (Hot in second degree and Dry in third degree)^{7,8,15,16}

Medicinal Use

In unani literature lac is categorized under the animal origin drug having many medicinal benefits. It has been in practice since ages/centuries for its antiobesity, deobsterent and is an excellent liver tonic. Recently it has been pre-clinically evaluated for its hypolipidimic action and antifertility actions showing promising results.

Lac (*Laccifer lacca* Kerr) is an important drug of *Unani* Medicine and it has following medicinal properties like, haemostatic^{8,16}, siccative^{8,15,16}, liver tonic^{9,16,17}, contraceptive^{15,18,19}, anti inflammatory^{7,16,20}, anti bilious^{15,20}, stomachic^{15,20}, aphrodisiac^{15,20}, detergent^{7,16}, deobstruent^{9,17,21}, anti obesity^{9,17}, expectorant¹⁶, kidney tonic¹⁵, emmenagogues.¹⁵

And it is indicated to be used for following ailments, obesity^{9,17}, hyperlipidemia¹⁵, renal, hepatic & spleen disorders^{7,8,9,15,20,21}, jaundice^{9,8,16,15,17}, ascitis^{7,8,9,15,16,17}, back ache^{15,20}, premature ejaculation^{15,20}, leprosy^{15,20}, cough^{7,15,16}, hemiplegia^{7,15}, asthma¹⁶, haemoptysis⁷, epilepsy¹⁵, chicken pox¹⁵, ulcerations¹⁵, worm infestation¹⁵, palpitation^{7,9,17}

Animal Study:

Anti-fertility activity of *Luk* as a single drug; was tested by Aisha *et al* (2013).²² Result shows *Luk* interfere with normal ovulation by disrupting the estrus cycle and prolonging the diestrus phase. It has also hinders the implantation and exhibits teratogenic effect possibly by virtue of its estrogenic effect. Ghufran *et al* (2011) tested the *Luk* for its effects on diet induced hyperlipidemia in albino rats and it was found significant.²³ An indigenous preparation (AYUSH-47) having *Laccifer lacca* (*Luk*) as one of the ingredients in combination with *Saraca indica*, *Areca catechu*, gold and sugar has claimed to exhibit anti-implantation effect in rabbits.²⁴

Compound formulations:

Various compound formulation of unani medicine having lac as a chief and active gradients are in Indian market few of them are; *Safoofe muhazzil*,²⁵ *Dwaul Luk*,²⁶ *Dwaul zarishk*,²⁶ *Qurse ambar baris*,²⁷ *Qurse ambar baris qawi*,²⁷ and *Qurse Luk*.²⁸

CONCLUSION:

Since lac is full of medicinal properties and indicated for various ailments in unani medicine and other traditional and CAM system, it is not much evaluated in biological field yet. Only few

studies carried out in support of its use as medicinal drugs. So more filtered studies are needed to re evaluate and justify its rational use for range of those ailments for which it is already being used in Unani and other Complementary and alternative system of medicines since ages.

REFERENCES:

1. Report: The study on Lac sub sector, Department of panchayat & rural development, Raipur: Chhattisgarh state institute of rural development, Govt. of Chhattisgarh, Nimora. 2010: 3 [Cited 2013 February 26]
2. http://www.rd.ap.gov.in/Marketing/Mkt_Doc_Lac.pdf [Cited 2013 February 21]
3. Singh R. Applied zoology lac culture. Department of zoology. zaranasi: Udai Pratap autonomous college; 2012: 1-18. <http://nsdl.niscair.res.in/bitstream/123456789/219/1/Lac+Culture.pdf> [Cited 2013 February 19]
4. <http://www.memidex.com/lac#etymology> [Cited 2013 February 10]
5. <http://www.etymonline.com/index.php?term=lac> [Cited 2013 February 10]
6. The Wealth of India. A dictionary of Indian raw material. Vol. IV (L-M), CSIR India publication; 2003: 1-12.
7. Hakim AH. *Bustanul Mufradat*. New Delhi: Idarae kitabul shifa; 2002:196, 516.
8. Kabiruddin M. *Makhzanul Mufradat*. New Delhi: Ejaz publishing house; YNM: 331, 365.
9. Baitar IZAA. *Al Jami Li Mufradat Al Advia Wal Aghzia*. Vol. IV. New Delhi: Urdu translation by CCRUM; 2003: 253-254.
10. Nadkarni KM. Indian plants and drugs with their medical properties and uses. New Delhi: S rishti book distribution; 2005: 115.
11. Ali M. Pharmacognosy (Pharmacognosy and Phytochemistry). Vol I. 1st ed. (Reprint). New Delhi: CBS publisher & distributors Pvt. Ltd; 2009: 732-33.
12. Evans WC. Trease and Evans pharmacognosy. 15th ed. Saunders; 2003:443-44.
13. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 43rd ed. Mumbai: Nirali parkashan; 2009: 11.141-11.142.
14. Wallis TE. Text book of Pharmacognosy. 5th ed. CBS publisher a distributors; 2005: 494-96.
15. Ghani N. *Khazainul Advia*. 1st ed. New Delhi: Idara kitabul shifa publication; 1971:1175-1176.

16. Kabiruddin M. *Ilmul Advia Nafeesi ma Zameema*. New Delhi: Ejaz publishing house; YNM: 331.
17. Maghrabi AI. *Kitab Al Fath Fi Al Tadawi* (Urdu Translation by Dept. of AYUSH). 1st ed. New Delhi: NCPC printers; 2007:42,138-39.
18. Khan MA. *Ramooze Azam*. Vol. II. New Delhi: Delhi printing press; 1335 Hijri: 262.
19. Kabeeruddin M. *Al Akseer*. Vol. II. New Delhi: Aijaz publication house; 2003: 1403.
20. Vohora SB, Khan MSY. Animal origin drugs used in Unani medicine. New Delhi: Vikas publication; 1979: 40.
21. Tabri Raban. *Firdausul Hikmat* (Urdu translation by Hakeem Rasheed Ashraf Nadvi). New Delhi: CCRUM; 2010: 365.
22. Aisha P, 2013: Evaluation of *Luk* for its antifertility activity in rat model. Dissertation. Rajiv Gandhi University of Health Sciences (RGUHS) in Ilmul Advia (Pharmacology). Bangalore, Karnataka, India.
23. Ghufran A, Laique A, Khan NA. The effect of *Luk magsool* (processed Lac) on diet induced hyperlipidemia in albino rats. *Hippocratic Journal of Unani Medicine* 2011; 6(2): 155-165.
24. Suganthan D, Santhakumari G. Antifertility activity of indigenous preparation Ayush-47. *Indian J Med Res* 1979; 70(3): 504-516.
25. Kabiruddin M. *Bayaze Kabir*. Vol II. Delhi: Daftar al-Masih, Balli maran; 1967:101.
26. Lavekar GS. Inventory of animal products used in Ayurveda, Siddha & Unani. Part II. New Delhi: CCRAS; 2008:537.
27. National Formulary of Unani Medicine. 1st ed. Part IV. New Delhi: The controller of publication; 2006: 43-44.
28. Azam HK. *Makhzanul Mujarrabat* (Urdu translation Qarabadeen Azam). New Delhi: Aijaz publication house; 1996:514.