

*King Saud University
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The Deirum

An Internship Seminar

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Introduction

Traditions and habits differ among nations and societies in various ways. Oral hygiene habits is one of them. For example, it is common among Muslims to use Miswak (chewing stick) since the prophet Mohammed, peace be upon him, recommended its use several times a day.

This review was concentrated on another habit which has a strong relation to the oral health. It is the use of Deirum, a fibrous chewing stick obtained from the inner bark of the walnut tree or *Juglans regia*, which is being used as oral hygiene and cosmetic aid.

The reason why this topic has been chosen was due to the practice of this habit among the women in our community. Even though, this habit is becoming less common in the new generation. The use of Deirum is still in practice with a very little attention given on its relation to oral health.

The inner bark of *Juglans regia* is known in some parts of Arabian Peninsula as Deirum, Deirumah or Deiruman, also, it is known as “Acrot ki chall” in India peninsula . This review will include information about :

- The plant (name, origin, distribution, description, chemical composition, uses.)

- The habit of using Deirum, and
- A questioner about this habit in Riyadh city.



Figure 1. Shows the White Walnut tree (*Juglans regia*).

I. Juglans regia in glance

Name:

The tree is called as a white walnut, common walnut, English walnut, or Persian walnut(Fig. 1,2), It belongs to the *Juglandaceae* and has the scientific name *Juglans regia*.



Figure 2. Shows the walnut tree.

The Latin name *Juglans* means

the nut of Jove or Jupiter ⁵, and the word *regia* is Latin and means royal, that was probably applied because of its attractive appearance, delicious flavor ²⁵, and historical importance as a source of timber and food.²⁶

The name **walnut** is an old English word which means “Foreign nut”.⁵

Source and Distribution:

The origin of the **white walnut** is in the continent of Asia.³⁵ The tree distributed in Asia minor, middle Asia, Iran, Afghanistan, and in these areas **white walnut** have been found before Christ.³⁴

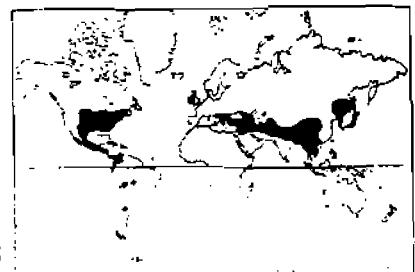


Figure 3. Shows the distribution of the tree in the world.

Some authors said ⁹, that from ancient Persia, other said ³⁰, from Asia minor (currently Turkey), the **white walnut** was transported to Southern Europe, from there to England, and eventually to America. Nowadays, the tree has a wide distribution else where its original sites, it is present in north and south America, China , Japan, North Asia and all over Europe (Fig.3).⁵

Description of the tree:

Typically a tall deciduous tree, up to about 30m in height (Fig. 1,2), with a smooth grey bark on young trees and fissuring (Fig. 4,5), but not scaling in old ones.^{3,11,27} It is an aromatic tree², its leaves are alternate, pinnate, with 5 to 11 obovate or elliptic.

Its leaflets are 6-15 cm long, 7-9cm widest above the middle. The fruit is 4-5 cm long¹³, nuts variously sculptured (Fig. 7,8).¹²

Walnut trees have a long life, some of them reach 300-400 years³⁴. Its self pollinated, but uses two or more trees improves the yield. The tree takes five to eight years to bear nuts¹⁴.



Figure 4. Shows the grey bark deeply fissured into a typical pattern of hard irregular ridges .



Figure 5. Shows the bark and a twig bud.

Chemical contents:

The fruit contents are fixed oil and vitamin C.²⁶ The leaves contents are abitler compound, hydrojuglone, tannic acid, inositol, vitamin P. and PP. volatile oil and Juglone. The latter constituent shows features of anti-microbial effect^{30,33}.

The bark of the plant (the Deirum) contains : glycosides, resin, volatile oil, tannic acid, phenolic Acid, Juglone and Juglandic acid.¹

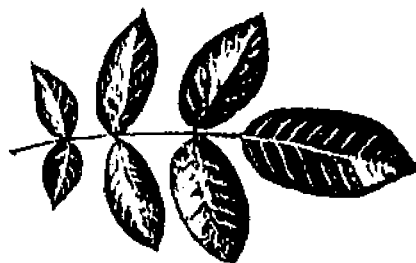


Figure 6. Shows large pinnate leaves with 7 leaflets.



Figure 7. Shows immature Walnuts.

General Uses:

- The wood is very good for making a high quality furniture, it is one of the most elastic and beautifully wood.^{19,25} Between 17th and 19th centuries enormous numbers of the tree were felled for gun stocks and furniture.¹⁷



Figure 8. Shows nuts.

- The oil expressed from the nuts, provides a cooking oil²⁶ . Also the strongly flavored nuts are mainly used in confectionery and ice-cream.¹⁰
- The nuts have a good nutritional value (e.g. 500 g of dry nuts contain 3500 calories).³⁵
- Oyl of extraordinary use with the painter, and other delicate colors.¹⁷
- Both the green walnut husks and fresh leaves have been used as a brown hair dye for centuries, remaining as the main constituent of proprietary hair tints until the beginning of the twentieth century.²⁶

Medical Uses:

- Walnuts are natural source of manganese.²⁴
- The inner bark, especially of the root, a very mild innocent and efficacious laxative, is usually employed in America in the form of an extract, the bark of the stem was said to be rubefacient.¹⁶
- The juice of green husks boiled with honey is an excellent gargle for sore mouths. When the kernels grow old, they are used to heal wounds of the sinews, gangrenes and carbuncles. If burned, the kernels are astringent and will stay laxes.²⁴
- Dried leaves are boiled, and the decoction taken as an astringent to relieve sore throat; it also serves as a diuretic in cases of swollen legs (edema)²⁰,

the dried leaves are astringent and used in form of an infusion as a skin application, this is suitable for conditions such as: eczema, herpes and ulcers. also the leaves use for treatment of scrofula, Chilblains²⁶, Richets and in case of leucorrhea in ladies, also the leaves are use to stop the milk secretion from nursing mother after weaning.^{30,32} The dried leaves and fresh fruit are used as tonic astringent, anti-inflammatory, and weakly hypoglycemic.²⁶

- A study by Perusquia et al.²³ evaluated the effect of aqueous extracts from five Mexican medicinal plants on isolated rat aorta, one of these plant, was *Juglans regia* leaves. Their results indicated that aqueous extracts of these five medicinal plants contain active substances which reverse NA-induced smooth muscle contraction, making them possibly effective for the treatment of clinical disturbance where high smooth muscle tension is the main symptom. Thus, their data tend to support the ethnomedical application of *Juglans regia* for the treatment of hypertension and other cardiovascular ailments.

II. The Deirum

What is Deirum ?

It is a natural oral hygiene and cosmetic aid which is a fibrous chewing stick, obtained from the bark of a tree known by botanists as *Juglans regia* (white walnut).

It is known in Saudi Arabia and The Gulf area as Deirum (Deiruman, Deirumah), and in some areas of India as “Acrot ki chall”. Deirum is presented in the market as a fibrous, thin, sticks that vary in length. It has a feeble odor and somewhat acrid bitter taste.

Why Deirum is used ?

Its purpose is for cleaning the teeth and to give the lips a healthy, attractive looking. It is used as toothbrush by women in the Arabian Peninsula for cleaning teeth and thought to make teeth look whiter and shiny, Deirum is also being used as a dye for coloring lips, which will gain red-brown coloration .

What is the chemical constituents of Deirum ?

1. Glycosides

They are compounds that yield one or more sugars among the products of hydrolysis.²⁸ The glycoside when interact with saliva, the end result is the release of Juglone.

2. Juglone and Juglandic acid.

Some authors¹ recommended to stop using Deirum because, it may predispose to mucosal neoplastic changes on the basis of Juglone. They depended on the findings Van Duuren et al. when concluded that Juglone may produce qualitative tumor-producing activities.

The study of Van Duuren et al.²⁹ does not help them in their recommendation because, the mentioned study showed that Juglone may produce qualitative tumor-producing activities, only when pretreatment with Anthralin preceded its application . Accordingly, there is no hazard from the Juglone alone . Another in vitro study by Frew and coworkers, showed that the Juglone and Methyl Juglone has anti-tumor effects.⁶ Lemberkovics et al.¹⁵ explained the cell-growth inhibitoric effect of Juglone. On the other hand, the Deirum

contains tannic acid and polyphenols which show anti-tumor effect on animals and in vitro.^{4,7,22}

3. Phenolic acid

Phenols, show antiseptic effects, and, if it took with high dose, it has a toxic effect upon the central nervous system.³¹ It may be irritant to skin and mucous membrane.¹

4. Tannic acid

It is not a single homogeneous compound, but is a mixture of esters of gallic acid with glucose whose extract composition varies according to its source. Tannic acid, is an astringent. Its topical use is now restricted to the treatment of bed sores, minor ulcerations and the likes.²⁸

5. Volatile oil

Volatile oil, in general are most commonly used for flavoring purposes, that possesses a carmination action. The volatile oils are employed widely as flavors for foods and confections and in the spice, perfume, and cosmetic trades.²⁸

6. Resin

Resins are amorphous products with a complex chemical nature.

They are usually formed in Schizogenous or in Schizolysigenous ducts or cavities, and are end products of Metabolism. Physically, they are usually hard, transparent ,or translucent and, when heated, soften and finally melt. Chemically, they are complex mixtures of resin acids, resin alcohols , resinotannols, esters, and resens²⁸.

How it is used ?

Some women soak the Deirum in water before use , they also chew on it to make it wet , then they rub the teeth especially the anterior teeth, with the wetted Deirum. Women also dye the lips by squeezing the Deirum on the lip to release the stain material. They apply the Deirum over the lips from side to side using light continuous strokes. Some women keep the Deirum inside the mouth and suck it from time to time. This make-up procedure might take 5 to 60 minutes

What is the mechanism of action ?

1. Oral hygiene

- Mechanical Cleaning .

2. Cosmetic Action

- The glycoside when interact with saliva, the end result is the release of Juglone. When Juglone dissolved in alkaline solution, it will produce purplish red color . This chemical reaction is believed to be the cause of coloration produced by Deirum on the lips when subjected to the alkaline action of saliva¹.

Oral manifestation related to Deirum use :

1. Tissue pigmentation : Clinically examination to Deirum users reveled a dark brown gingival, labial mucosa up to the vermilion border. The discoloration might be with a different concentration depending on the habit of the users. Unusual pigmentation related to using Deirum is reported by Gazi⁸ , and Ashri & Gazi.¹

2. Dry lip : clinical examination might reveled a dry , crusted lips .

3. White lesion : increasing incidence of white lesion among Deirum users has been reported²¹.

III. Questioner about Deirum habit in Riyadh city

A total of 228 Saudi female from Riyadh city were randomly selected to answer - This questioner was distributed among 228 Saudi female of 12 to 70 years old in Riyadh city . Data obtained from the questioner will be presented orally.

Conclusions

Using Deirum as oral hygiene and cosmetic aid is still practised by Saudi women. More investigation are needed to cleared the effect of Deirum on the oral health.

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