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Phyllanthus reticulatus for oral health

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Abstract

Medicinal plants have become important in our day to day life. Oral thrush or candidiasis is the most common problem which challenges oral health. To maintain oral health and hygiene our ancestors as well as the indigenous people used chew sticks and dried leaf powders. One of the important multipurpose medicinal plants is *Phyllanthus reticulatus*. Phytochemicals which are present in this plant make it an efficient medicinal plant. All parts of this plant are used as a remedial measure for many oral disorders which are ecofriendly and cheaper. When compared to toothbrushes, commercial tooth pastes and powders chew sticks and tooth powder made from *P. reticulatus* twigs and leaves have several advantages. The study area of the present study is the foot hills of Velliangiri Hills, part of Western Ghats in the Tamil Nadu State coming under Nilgiri Biosphere.

Keywords: *Phyllanthus reticulatus*, oral disorder, chew sticks, Velliangiri hills

Introduction

Medicinal plants have become part and parcel of our day to day life. These medicinal plants are commercially important and if managed properly they will earn more revenue to the country where they grow. One such medicinal plant is *Phyllanthus reticulatus*, A multipurpose plant, providing a range of medicinal uses and other commodities for the local people, as well as a possibly edible fruit. Commonly this plant grows as a weed. In this article the role of *Phyllanthus reticulatus* in oral health and hygiene will be discussed.

Study Area

The study area of the present study is the foot hills of Velliangiri Hills which forms the eastern part of Western Ghats in the Tamil Nadu State. The area forms a part of Nilgiri Biosphere. It is located between 10.9888°N and 76.6873°E. The study area has typical tropical climate and is situated in the elevation of 300 MSL with an annual rainfall about 150 mm. The rich flora and fair knowledge of tribal people about medicinal plants provides an ideal condition to carry out the pharmacognostical study. The study is confined to the area of settlements of indigenous tribal people in Velliangiri hills located at a distance of 26 kms from Coimbatore city.

Materials and methods

Phyllanthus reticulatus (Family – Euphorbiaceae, syn: *Kirganelia reticulata* (Poir))

The plant is a monoecious, branched, large, scandent and strangling shrub, branches smooth and somewhat angled. Leaves have alternate arrangement, lanceolate, simple and variable in size. The apex of the leaves is acute, ventral side is dark green in colour while dorsal side is light-green. It is having bitter taste and pungent odour. Leaves are 2.5-5 cm long and 0.7-1.5 cm broad, oblong and elliptic in shape. The margins of the leaves are emarginated to undulate. Flowers are axillary on slender branches. Fruits are coriaceous, glabrous, globose berries with persistent calyx, fleshy and 8-16 seeded. Seeds are irregularly trigonous. Commonly this plant is known as Black-Honey Shrub, black-berried featherfoil, potato-bush and netted-leaved leaf-flower. In Kannada it is called by the name karihuli and in Malayalam nirnelli. In Sanskrit it is known as krishna-kamboji. In Tamil it is known as civappuppula, karunelli and pula. (Plate 1, 2).

Phytochemicals

Phytochemical analysis reveals the presence of steroids, flavanoids, tannins, phenol and quinine. Three compounds (lupeol, lupeol acetate, and stigmasterol) were isolated and identified by phytochemical study conducted on the leaves of *Phyllanthus reticulatus* (Jamal *et al.*, 2008) ^[1].

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Oral problems

Some common oral problems include oral cancer, systemic disease, tooth decay, gingivitis, periodontitis, dental plaque, bad breath, xerostomia, oral candidiasis, stomatitis, cold sores, canker sores, oral thrush, leukoplakia, dry mouth and bad breath. Oral thrush or candidiasis is the most common problem which challenges oral health.

Symptoms of oral thrush/ candidiasis

During the initial stage of oral thrush the symptoms are not exhibited outside. At later stages the following signs and symptoms may appear.

- Appearance of few white, small lesions on the surface of the tongue, inner cheeks, gums, tonsils and the palate
- Lesions are raised with creamy appearance
- Burning sensation and redness of the mouth
- Cracking at the corners of the mouth
- Difficulty in swallowing
- Loss of taste
- White coating on the surface of the tongue
- Dryness of the mouth
- Feeling thirsty always
- Dried and cracked lips
- Irritation in the oral cavity
- Esophagitis

Causes

Weakened immune system, Between Infants and breast-feeding mothers, Underlying medical conditions, Diabetes, and Medications are few causes.

Indigenous curative measures

At earlier days our ancestors used chew sticks and dry leaf powders to maintain their oral health. Chew sticks are simply made out of frayed twigs. Different species of plants and tree twigs are used as chew sticks. One end of the stick is frayed and the other end is little sharpened. The twigs with a frayed end are used to brush against the teeth, (Panati, Charles (2013) [2] and the other end is used as a toothpick. The earliest chew sticks have been dated to Babylonia in 3500 BC [2] and an Egyptian tomb from 3000 BC; they are mentioned in Chinese records dating from 1600 BC (Yu, Hai *et al.*, 2013) [3] and in the Tipitaka, the Buddhist Canon, purported to be giving account of events which took place in the north-western India around the 5th century BC. Traditional Sikhs use chew sticks even today as it is written in their scriptures. It is commonly used in parts of Africa, Asia, and the Middle East. These chew sticks have many medicinal properties to maintain oral hygiene. So, careful selection of the right plant is required before use. Hence, *P. reticulatus* has many medicinal properties it is better to use it to maintain oral health. (Plate 3, 4)

Results and discussion

Use of *P. reticulatus* in oral care

All parts of this plant namely leaves (Shruti *et al.*, 2012) [4], stem, root and fruits are used as a remedial measure to get rid of certain oral disorders. The details are presented in the Table 1

Table 1: Activity of *P. reticulatus* on different oral disorders

S. No	Disorder	Plant part used	Mode of administration	Activity
1	Oral thrush	Leaves	Rubbing	Antimicrobial
2	Candidiasis	leaves	Rubbing	Antimicrobial
3	Tooth ache	Leaves, bark	Gargling	Antinociceptive, Analgesic
4	Tooth decay	Leaves	Brushing	Antibacterial
5	Sore throat	Leaves	Decoction	Antibacterial
6	Bleeding gum	Leaves	Tablet	Antibacterial
7	Leukoplakia	Stem	Chew stick	Antibacterial
8	Dental plaque	Stem	Chew stick	Antibacterial
9	Xerostomia	Stem	Chew stick	Saliva stimulant
10	Cold sore	Leaves	Chewing	Antiviral
11	Canker sore	Leaves	Chewing	Analgesic
12	Dry mouth	Stem	Chew stick	Saliva stimulant
14	Oral cancer	Whole plant	Infusion	Antinociceptive, Analgesic, Anti-Cancer. (Aarthi and Ramesh Babu, 2017) [5]
15	Gingivitis	Whole plant	Gargling	Antibacterial, Anti-Inflammatory
16	Periodontitis	Leaves	Gargling	Antibacterial, Anti-Inflammatory

Leaves are powdered and combined with cubebs and camphor to make tablets that can be sucked to treat bleeding gums (Kumar *et al.*, 2014) [6]. The twigs are used as chew-sticks and toothbrushes, leaf decoction is drunk as a curative measure for sore throat. This proves that it has anti-bacterial activity. Rubbing the pounded or mashed leaf on the surface of the tongue cures oral thrush and candidiasis. Cleaning or brushing the teeth with dried leaf powder along with little salt stops tooth decay.

Leaves and bark infusion is an effective odontalgic, gargling the mouth with the infusion cures tooth ache. This proves the analgesic activity of this plant. Dental plaques and leukoplakia is cleared by using the sticks as chew sticks. This chew sticks also cures xerostomia, cold sores, canker sores, dry mouth, and bad breath. cracks on the lips and on the surface of the tongue are cured by chewing few fresh leaves

frequently. Chewing fresh leaves also reduces the severity of oral cancer. Leaves have anti-inflammatory and antinociceptive properties (Hajera *et al.*, 2013) [7].

Conclusion

When compared to toothbrushes, commercial tooth pastes and powders chew sticks and tooth powder made from *P. reticulata* twigs and leaves have several advantages:

- Ecofriendly
- Cheaper, almost free of cost.
- Independence from external supplier if made at home from privately owned trees
- The twig is replaced every few weeks to maintain proper hygiene.
- No need for toothpaste



Plate 1



Plate 2



Plate 3



Plate 4

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