

Betel Leaf – The Green Gold

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Abstract

Betel leaf (*Piper betel*) is known for its vast medicinal properties. Piper betel is a mouth freshener, cardiac tonic and possess various other activities such as antifungal, antioxidant, carminative, digestive, antiplatelet, CNS depressant, antipyretic, anticarcinogenic, anti-inflammatory, immunomodulatory antithrombotic activities.

Key words: Betel leaves, piper betel, chavicol.

INTRODUCTION

The betel leaf commonly known as 'Paan' or 'Nagvalli' (family-Piperaceae) is an evergreen and perennial creeper [1] Significance of leaves has been explained in relationship to every sphere of human life including social, culture, religious and is very much relevant even in modern days [2] From ancient time betel are chewed along with areca nut, slaked lime, cardamom and clove in many Asian countries [3]. Various properties of betel leaf include antioxidant, antifungal, antiulcerogenic, antiplatelet, antidiabetic, immunomodulatory, antileishmanial, antiamebic, anti-inflammatory, antifilarial and antimicrobial [4], antifertility [5], antihyperglycemic [6], antidermatophytic [7], antinociceptive [8] and radioprotective properties [9].

Piper betel is one of the invaluable medicinal plants where its leaves have been used for many medicinal purposes. *Piper betel*, a member of the Piperaceae, which is a large plant family, is also known *Paan* in India and *Sirih* in Malaysia and Indonesia. The fresh leaves of betel leaves have been wrapped together with the areca nut, mineral slaked lime, catechu, flavoring substances and spices are chewed since the ancient time [10]

Betel leaf has been described from ancient time as an aromatic stimulo-carminative, astringent and aphrodisiac.

The leaf produces an aromatic volatile oil contains aphenol called chavicol, which has a powerful antiseptic properties. The alkaloid arakene has properties resembling cocaine in some respect. Pharmacological effects of betel chewing include abundant flow of saliva, temporary dulled of taste perception, stimulation of muscular and mental efficiency. [11]

Scientific research on the leaf of this plant reveals that it possesses many beneficial bioactivities and its extract from betel leaves has a great potential to be used in developing commercial products. Due to the numerous benefits, betel vine is grown for its leaves. The best conditions for commercial betel vine cultivation are those of tropical rain forests, which provide cool shade, considerable humidity and an adequate supply of soil moisture like Indonesia, Malaysia, Philippines, Thailand, Cambodia, Vietnam and India [12] The leaves contain vitamins and significant amount of all essential amino acid except lysine, histidine and arginine which occurs in traces.[13]

PROPERTIES

Quid chewing is carcinogenic, it is believed that unlike other constituents of the betel quid, the betel leaves devoid of carcinogenic effects and on the contrary possess cancer preventive effects including protective effects against the carcinogens present in tobacco.[14] In a study, cancer was induced in Swiss male mice with tobacco carcinogens. The study group which was treated with betel leaf extract showed resistance to cancer. This study proved that contents in the betel leaf extract had certain antioxidant products that neutralized the tobacco carcinogen- induced damage. [15]

Levels of several serum antioxidants like ascorbic acid, vitamin E, superoxide dismutase, catalase and glutathione peroxidases were increased when we consume betel leaf extract.[16]

Piper betel L. leaves is widely used as a mouth freshener after meal. This plant is extensively grown in Bangladesh, India, Sri Lanka, Malaysia, Thailand, Taiwan and other Southeast Asian countries. Its common name is betel in English, paan in India and Bangladesh [17]. Indian system of medicine and health has adopted the use of betel leaves in various ways. In Indian folkloric medicine, betel leaf is popular as an antiseptic and is commonly applied on wounds and lesions for its healing effects. Essential oil extracted from betel leaf may be used as an industrial raw material for manufacturing medicines, perfumes, mouth fresheners, tonics, food additives etc [18].

Betel Leaf extract even showed beneficial effect in terms of reduced tumor growth rate in animal tumor models. [20] The extract of betel leaves inhibited emergence of DMBA - induced mammary carcinogenesis in rats. However, it did not inhibit the growth in already induced mammary tumors. Chemopreventive effect of betel leaves was demonstrated [21] where administration of BL extract lowered the benzo [a] pyrene induced fore - stomach papillomas in Swiss mice. Maximal inhibition of papilloma development was observed in mice receiving hydroxychavicol - a constituent of Betel Leaf extract.

CONTENTS OF BETEL LEAF

Piper betel contains a wide variety of biologically active compounds whose concentration depends on the variety of the plant, season and climate. The aroma of betel leaf is due to the

presence of essential oils, consisting of phenols and terpenes.

The various phytochemicals found in the betel plants are chavibetol, chavicol, hydroxychavicol, estragole, eugenol, methyl eugenol, hydroxycatechol, caryophyllene, eugenol methyl ether, cadinene, γ -lactone, allyl catechol, p-cymene, cepharadione A, dotriacontanoic acid, tritriacontane, p-cymene, terpinene, eucalyptol, carvacrol, sesquiterpenes, cadinene, caryophyllene, dotriacontanoic acid, hentriacontane, pentatriacontane, stearic acid, n-triacontanol, triotnacontane, piperlonguminine, allylpyrocatechol diacetate, isoeugenol, 1, 8-cineol, α -pinene, β -pinene, sitosterol, β -sitosteryl palmitate, γ -sitosterol, stigmasterol, ursolic acid, ursolic acid 3 β -acetate[19]

CONCLUSION

Betel leaf contains various biologically active compounds, which are responsible for its antioxidant, chemo preventive activities. Further research may be performed to study the detailed mechanism of action of betel leaves in various metabolic activities in human, which will be beneficial to mankind.

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