

Review on betel leaf

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Abstract

Piper betel L. belongs to family Piperaceae commonly known as Pan. plants whose leaves and seeds are used in combination for chewing purposes throughout wide areas of southern Asia and the East Indies. The betel leaves are nutritive and contain anti carcinogens showing promise for manufacturing of a blood cancer drug and various pharmacological activity shows like anticancer, anti-diabetes, anti-inflammation, analgesic and cooling properties. The present review aims to compile medicinal values of Piper betel generated through the research activity using modern scientific approaches and innovative scientific tools. Though its primary purpose is to be used as a mouth freshener, many people also use it for the numerous health benefits that it provides.

Keywords: betel leaf, cultivation of betel leaf, chemical constituents, nutritional values of betel leaf, therapeutical uses

Introduction

The betel leaf is an extremely common leaf. Piper betle is a also know Ayurvedic herb. It comes from the Piperaceae family of plants and is used as a popular mouth freshener in India. Betel leaf heart in shaped and Dark green in colour. Betel, also called paan, pinang, or penang, either of two different plants whose leaves and seeds are used in combination for chewing purposes throughout wide areas of southern Asia and the East Indies ^[1]. The plants are dioecious (individuals are either male or female) and produce white flowers arranged in small spikes called catkins. The betel plant is native to Southeast Asia. It is also used as a special item offered to the guests in order to show respect and for such traditional use of betel leaf in the Indian society, the leaf really stands alone without any parallel even today ^[2]. Though its primary purpose is to be used as a mouth freshener, many people also use it for the numerous health benefits that it provides.



Fig 1

Table 1: Scientific Classification

Botanical Name	Piper betle
Kingdom	Plantae
Order	Piperales
Family	Piperaceae
Genus	Piper species: P. betle

Table 2: Vernacular Name in Different Languages

English Name	Betel vine, betel
Hindi Name	Paan
MarathiName	Nagvel, Vidyachhepaan
Telugu Name	Tamal paaku
Sanskrit	Tamboolavalli, Tamboola, Tamboola vallika

Cultivation

The betel leaf is cultivated mostly in South and Southeast Asia, from Pakistan ^[4] to Papua New Guinea ^[5]. It needs a compatible tree or a long pole for support. Location: The plant does best in filtered sunlight, so keeping it at a dappled or shaded location would be best—also, avoid keeping it in a totally dark spot. Never expose the plant to the harsh afternoon sun for long, as it will burn the foliage. Irrigation is frequent and light, and standing water should not remain for more than half an hour.

Dried leaves and wood ash are applied to the furrows at fortnightly intervals and cow dung slurry is sprinkled. Application of different kinds of leaves at monthly intervals is believed advantageous for the growth of the betel. In three to six months, the vines reach 150 to 180 cm in height, and they will branch.

It refers slightly acidic, sandy-loamy, and lightly damp soil but it should not promote waterlogging.

Waterlogged, saline and alkali soils are unsuitable for its cultivation ^[6]. Use a well-drained potting mix rich in organic matter like aged manure, you can also mix coarse sand to improve drainage.



Fig 2

Chemical Constitute

Is mostly chavibetol dominant [1, 30]. Safrole is a major component of Sri Lankan piper betle [31]. Eugenol, Isoeugenol, and Germacene D are other dominant compounds in other chemotypes [32]. Leaves also contain eugenol, chavicol, hydroxychavicol [33, 34] and caryophyllene [30]. Roots contain aristolactam A-II, a new phenylpropene, 4-allyl resorcinol and a diketosteroid stigmast-4-en-3,6-dione [39]. Leaves contain good amounts of vitamins particularly nicotinic acid, ascorbic acid and carotin. Stems contain phyosterols (beta-sitosterol, beta-daucosterol, stigmasterol etc.), alkaloids (piperine, pellitorine, piperdardine, guineensine etc.), lignan (pinoresinol) and other bioactive components. Some of them are oleanolic acid, dehydropiperonaline, piperolein-B, Bornyl cis-4-Hydroxycinnamate and Bornyl p-Coumarate [35, 36, 37, 38]. Essential oil consisted of 50 different compounds, of which major components are eugenol, caryophyllene, terpinolene, terpinene, cadinene and 3-carene [40]. Large concentrations of asparagines are present while glycine and proline occur in good amount. Essential oil of leaf gives it the aromatic flavour. β sitosterol is present in the root [5].

Nutritional Value of Betel Leaf

It contains decent amounts of essential nutrients. Let check out nutrition facts of betel leaf per 100 grams, there is 1.3 micrograms of iodine, 1.1-4.6 micrograms of potassium, 1.9-2.9 micrograms of vitamin A, 13-0 micrograms of vitamin B-1, 1.9-30 micrograms of vitamin B-2, and 0.63-0.89 micrograms of nicotinic acid. These nutrients present in betel leaves are good for your health [6].

Betel Leaves - Nutritive Value of Common Foods

1. Energy (Ecals)
2. Moisture(gm)
3. Protein(gm)
4. Fat(gm)
5. Mineral(gm)
6. Fibre(gm)
7. Carbohydrates(gm)
8. Calcium(mg)
9. Phosphorous(mg)

Its calorific value is 44 [6].

Therapeutic Uses

1. Betel leaf benefits for cancer patients

Although betel nuts can increase the risk of tobacco, betel leaves have anti-cancer compounds in them. Betel leaves have phenolic compounds in them that can contain a range of properties such as anti-bacterial, anti-mutagenic, antioxidant, and anti-proliferative. Betel leaves also have high amounts of phytochemicals, which can help fight oral and colon cancer. Betel leaves also help fight oxidative stress and eliminate free radicals. Both of these factors are important in preventing cancer. Various experiments evaluating effects of BL suggested no harmful effect when consumed alone. Bhide *et al* [7], demonstrated effect of aqueous BL extract where administration of areca nut extracts in Swiss and C17 mice developed different types of cancer while control group and mice fed with aqueous BL extract did not develop any tumors.

2. Betel leaf benefits for diabetes patients

Diabetes is an extremely common disease and though there are numerous anti-diabetic medications out there, it is best to avoid them as they often have side effects on the liver and kidneys. Herbal remedies, such as betel leaf cures diabetes. Betel leaf can help reduce the overall glucose levels in your blood, which is great for people who have Type 2 diabetes. Arambewela *et al.*, (2005) investigated the antidiabetic activity of Piper betel leaves, tested in normoglycaemic and streptozotocin (STZ)-induced diabetic rats using oral administration of hot water extract (HWE) and cold ethanolic extract (CEE) [8].

3. Betel Leaf reduce cholesterol level

Having high cholesterol in your blood can increase your chances of getting a stroke. Betel leaves have eugenol in them due to which they aid in lowering your cholesterol levels. Moreover, eugenol also inhibits the amount of cholesterol that is generated in the liver and can help with reducing the amount of lipids absorbed by the intestine. This is very good for your body.

4. Betel Leaf Reduces respiratory issues

Betel leaf widely helps in treating issues related to cough and cold. It is an excellent cure for those suffering from chest, lung congestion and asthma. Apply some mustard oil on the leaf, warm it and place it on the chest to cure congestion. You can also boil few leaves in water, add cardamom, cloves and cinnamon in two cups of water. Reduce it to 1 cup and consume this concoction two to three times a day for excellent relief from congestion and breathing issues.

5. Betel leaf used in anti-microbial properties

The essential oil that is naturally present in betel leaves has antibacterial properties, which can help fight infections that are caused by bacteria. Moreover, since betel leaves is filled with phenolic and phytochemicals, it can be very effecting against gram positive and gram-negative bacteria.

6. Betel leaves helps in healing wounds

Betel leaves help with healing wounds. betel leaves are filled with antioxidants, which reduce the amount of oxidative stress your body is going through. The juice of a few leaves should be extracted and applied on the wound. Then a betel leaf should be wrapped over and bandaged.

The wound will heal up with a single application within 2 days.

7. Severe Headache

Betel leaf is a popular home remedy for headache. The betel leaf has analgesic and cooling properties. It can be applied with beneficial results over the painful area to relieve intense headache.

8. Inflammation

Applied locally, betel leaves are beneficial in the treatment of inflammation. that is inflammation of the testes.

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