

Proximate and Phytochemical Scrutiny of *Piper Betel* Leaves Powder

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Abstract

Betel leaves are rich in nutrients and phytochemicals. It has many medicinal properties therefore it is used in curing various diseases since ancient times. Anti-ulcer, anti-platelet, anti-diabetic, bad breath, boils and abscesses, anemia, conjunctivitis, constipation, headache, arthritis etc. are cured by betel leaves. The purpose of research is to evaluate the nutraceutical properties of betel leaves. Dried powder of betel leaves were used in testing moisture, fat, fiber, carbohydrate, protein, vitamin C, iron and calcium. Betel leave's aqueous extract was used in various assays such as phenols, alkaloids, saponin, tannin, steroids and other compounds. The phytochemicals screening of the leaf extract was determined by various methods. The results found that betel leaf have different types of nutrients and phytochemicals in it.

Keywords

Piper Betel, Nutraceuticals, Steroids, Alkaloids, Medicinal Properties



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INTRODUCTION

Medicinal plants have been collected from translations of ancient Indian books on health and healings. Today's conventional drugs use medicinal and curative properties of various plants. These drugs are used as herbal supplements, botanicals, nutraceuticals and drugs. Photochemicals detoxify the reactive intermediates and repair the damage occurring in the body. Betel plant, scientifically well-known as *Piper betel* belongs to family Piperaceae¹. Betel leaves are chewed in their natural raw form along with sliced areca nut, slaked lime, coriander, aniseed, clove, cardamom, sweetener, coconut scrapings, rose petal jam, ashes of diamond, pearl, jelly, pepper mint, flavouring agent, fruit pulp etc. since antiquities. Betel vines are one of the highly explored plants and it has wide variety of biologically active composition whose concentration depends on the variety of the plant, season and climate. Chemical compositions of essential oil hold safrole present in the leaf, stalk, stem, root and β -phellandrene present in betel fruits. The aroma of betel leaf is due to the presence of essential oils, consisting of phenols and terpenes². Betel leaves has a strong pungent flavor and smell improves appetite, tonic to

brain, heart and liver, decrease the thirst, clear the throat, beneficial for voice and purify the blood. By tradition betel leaves are useful for the treatment of various diseases like bad breath, boils, abscesses, conjunctivitis, constipation, headache, itches, swelling of gum and injuries³. Pharmacological effects have been also recognized to the leaves like anti-ulcer, anti-platelet, anti-diabetic⁴, anti-fertility, cardiogenic, anti-tumour, and anthelmintic⁵. Carvacrol, polyphenol, alkaloids, saponin, tannin, steroids and other compounds like chavicol, allylpyrocatechol, are also found in betel leaves⁶. The plants of genus *Piper* are also used for many other purposes such as foods and spices, fish bait, fish poison, hallucinogens, insecticides, oils, ornaments and perfumes⁷.

Oral cancer is one of the most common non transmissible diseases and the cause is smokeless tobacco⁸. Smokeless tobacco contains around 28 known carcinogens. These include the nonvolatile alkaloid-derived tobacco-specific N-nitrosamine and N-nitrosamino. Acids as a cluster where as volatile tobacco-specific nitrosamines, volatile aldehydes and some poly nuclear agents have also been present in smokeless tobacco⁹⁻¹⁰. Betel leaves is debatably the

most damaging plant whose regular consumption is believed to cause cancer of the oral cavity. But the side effects of betel leave are when it consumed with areca nut, catechu, slaked lime and tobacco. Scientific studies have shown that betel leaf is devoid of mutagenic and carcinogenic effect. Succeeding researches had shown that the betel leaf and some of its phytochemicals also prevented chemical induced cancers in experimental rats¹¹.

MATERIALS AND METHODS

Collection of plant materials:

There are many variety of *Piper betel* based on the color, size, taste and aroma. Some of the most popular Indian varieties are the Magadhi, Kammaru, Venmony, Mysore, Salem, Calcutta, Banarasi, Kauri, Ghanagete, Bagerhati, Metha and Madras. Out of these varieties Madras was selected as it is easily available in our area, the leaves were purchased from the local market Newai, Rajasthan, India. *Piper betel* fresh leaves were washed under the running tap water and then dried under the shade at room temperature. Dried leaves were powdered in electronic grinder and stored in air tight container for further use.

Nutrient Analysis:

Nutrients were analyzed by various methods viz., estimation of carbohydrates by Difference method¹², estimation of fat by Soxhelt method¹³, estimation of protein by Microkjeldhal method¹³, estimation of vitamin C by Titrimetric method¹⁴. Estimation of moisture content¹², crude fiber¹⁴ and ash¹² were also determined. Preparation of aliquot from ash for the estimation of iron by Wong's method¹² and estimation of calcium by Titrimetric method¹⁴.

Phytochemicals:

The aqueous extract of betel leaves were extracted for the phytochemical screening like alkaloids by Mayer's test¹⁵, glycosides by Modified Borntrager's test¹⁶ terpenoids by Salkowski test¹⁵, Saponins by Foam test¹⁶. Tannins by Gelatin test¹⁵, phytosterol by Libermann Burchard's test¹⁶, flavonoids by Alkaline Reagent test¹⁶, phenolic compound by Ferric Chloride test¹⁶. Steroids¹⁷ and catechins¹⁸ were also determined.

RESULTS

Table 1 Nutrients Analysis of *Piper betel* Leaves Powder

S. No.	Nutrients	<i>Piper betel</i>
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1.	Carbohydrate	63.92%
2.	Moisture	9.45%
3.	Protein	3.30%
4.	Fat	1.10%
5.	Fiber	10.15%
6.	Vitamin C	1.11%
7.	Ash	6.87%
8.	Iron	2.57%
9.	Calcium	1.53%

Table 1 showed that nutrient composition in the dried betel leaves powder in which contain of macro nutrient are carbohydrate (63.92%), moisture (9.45%), protein (3.30%), fat (1.10%), fiber (10.15%) and ash (6.87%). Micro nutrient are also present in *Piper betel* such as vitamin C, iron and calcium (1.11%), (2.57%) and (1.53%), respectively.

Table No. 2 Phytochemical Analysis of *Piper betel* Leaves Powder Extracts

S. No.	Phytochemical	<i>Piper betel</i>
1	Alkaloids	(+)
2	Glycosides	(+)
3	Tannins	(+)
4	Phytosterol	(+)
5	Saponins	(-)
6	Terpenoids	(+)
7	Steroids	(-)
8	Phenolic Compounds	(+)
9	Flavonoids	(+)
10	Catechins	(-)

Key :- (+) = present
(-) = absent

Table 2 showed that *Piper betel* leaves were found rich in alkaloids, phytosterols, phenols, tannins, glycosides, terpenoids and flavonoids. Whereas lacking in saponins, steroids and catechins.

DISCUSSION

Leaves are remedial for cough, dysentery, inflammations halitosis and on pancreatic lipase¹⁹ due to owning of these nutrients and phytochemicals. It is also used in curing wounds, burns, impetigo, furunculosis, eczema, lymphangitis and juice is beneficial for stomach pain. Kammaru is a variety of betel leaf has a good level of juice that heals sore throat and abdominal swelling. Its roots and fruits are well-known for treatment of malaria and asthma²⁰. Antimicrobial activity²¹, gastroprotective activity²², anti-cancer²³, anti-amoebic, anti-giardial²⁴ and radioprotective activity²⁵ are also cured by betel leaves. Betel leaf extract has two element β -carotene and α -tocopherol which are useful in reducing tumour and its frequency of occurrence²⁶. Dermatophytosis is a disease of the keratinized parts of the body (skin, hair, and nail) caused by a three genera of highly specialized fungi called the Dermatophytes is also cured by it²⁷. Study evaluated an aqueous extract of leaves to cytotoxicity studies on Hep-2 cell line. The mean CTC50 was 96.25 ug/ml suggesting potent cytotoxicity and probable anticancer property²⁸. The essential oils which contains in the leaves are antibacterial, antiprotozoal

and antifungal properties. Therefore, the oil kills or inhibits expansion of outrageous bacteria causing typhoid, cholera and tuberculosis etc. and helps in proper evaluation and exploitation²⁹.

CONCLUSION

Piper betel is very known to worldwide and consumed frequently as mouth freshener. These leaves are rich in nutrients, antioxidant and phytochemical due to therapeutic properties but less familiar to everyone. Removing the betel quid, areca nut, tobacco and other ingredients from the 'Paan' if we consume its leaves with aniseed, clove, cardamom and coconut only it will increase its health beneficial and or its juice will be more valuable to our body. Basically the side effects of the 'Paan' are due to the other ingredient chewed along with it not by betel leaves. It is too remedial for cancer, diabetic, immunity, radio protective, gastric problems, stomach pain and swelling. Therefore it can be conclude that the betel leaves are helpful to our health as well as protect us to different diseases and disorders.

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