



PHYTOCHEMICAL INVESTIGATIONS ON VARIOUS PARTS OF PIPER BETEL

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ABSTRACT

Paan is a tropical Asian vine closely related to the common pepper. The betel leaf itself has a spicy taste and yields an essential oil widely used as a medicine. The other constituents are chavicol, chavibetol, allylpyrocatechol, chavibetol acetate and allylpyrocatechol diacetate which is reported as fungicidal & nimatocidal activity. Leaves contained caryophyllene, cardinene, cardinene, gama-lactone, Roots of Piper betle had beta-sitostirole. The leaf is used as carminative, aphrodisiac, tonic, laxative and improves appetites, Head ache, inflammation, boils, and respiratory disorder. In the study undertaken on fresh leaves, root, stem and stalk from the *Piper betle*, belonging to family Piperaceae, an attempt was made to do pharmacognostical studies, successive extraction of constituent from various parts of Piper betel & isolation of pure constituents by column chromatography.

INTRODUCTION:

Leaf of *Piper betle* is also called as Pan, belonging to family Piperaceae. *Piper betle* contains Diosgenin¹, Essential oil i.e. eugenol, methyl eugenol, p-cymene, α -terpine². Triterpenes & β -sitosterol are isolated & shows antiplatelet & anti-inflammatory effects³. It has been seen that betle quid have Alkaloids & Nitrosoguvacoline as mutagenicities⁴. Propenylphenols i.e. chavicol, chavibetol, allylpyrocatechol is isolated from chloroform extract of leaves of Piper betle, exhibited significant antifungal activity⁵. Piperbetol, methylpiperbetol, piperol A, and piperol B, isolated from Piper betle and are effective PAF receptor antagonists⁶. The Reversible antifertility effect is shown by

Piper betle stalk in Swiss albino male mice⁷. Aqueous & ethanolic extracts of *Piper betle* leaves have antidiabetic activity⁸. Radioprotective property in ethanolic extract of leaf is reported⁹. It has antioxidative & antiplatelet effects in aqueous inflorescence of *Piper betle* leaf extract¹⁰ and Inhibitory action due to compound 7, 12-dimethylbenz[a]anthracene-induced mammary carcinogenesis in rats¹¹. Its pregnancy interceptive effect¹² and wound healing activity¹³ also reported. A lot of work has been carried out on various part of Piper betel but very few formulation are available using it. But very lesser effect have been made to develop formulation so therefore the present study is focus on development of formulation .

Hence present work was to find out active constituents of piper betel and prepare a formulation.

METHODOLOGY

Collection of plant material:

Collection, Identification and powdering: The plants of *Piper betel* was collected from the native of Allahabad in the month of September. The root, stem, leaf, stalk, of *Piper betel* were washed; shade dried, coarsely powdered and kept in airtight container for further studies.

Pharmacognostical evaluation: Root, stem, leaf, stalk of *Piper betel* were subjected to microscopical evaluation. Quantitative standards like moisture content, total ash value, alcohol soluble extractive values and water soluble extractive value were determined.

Extraction of plant material

Extraction was done at pilot scale as well as lab scale levels.

Pilot scale extraction: 10 gm of dried powdered root, stem, leaf, stalk of *Piper betel* were extracted successively with 500 ml of petroleum ether, Ethyl acetate, chloroform, ethanol and finally the marc obtained was used for the aqueous extraction by boiling the air dried marc in water and all the extracts were concentrated and yield was noted. Result was tabulated in Table 1.

Preliminary Phytochemical studies of *Piper betel*. Qualitative chemical test for different extracts of *Piper betel* were carried out and the tests have shown the presence of alkaloids, sterols, sugars, flavonoids and phenols in different fractions of root, leaf, stem, aerial part and fruits. (Table 2)

Table 1: Pilot scale extraction of various part of *Piper betel*.

| S.No | Plant part | Extracts | Wt of extracts (Gms) |
|------|------------|---------------|----------------------|
| 1 | Root | Pet.ether | 0.2 |
| | | Ethyl acetate | 1.6 |
| | | Chloroform | 7.6 |
| | | Ethanol | 2.7 |
| | | Aqueous | 5.3 |
| 2 | Leaf | Pet.ether | 11.7 |
| | | Ethyl acetate | 6.3 |
| | | Chloroform | 10.3 |
| | | Ethanol | 8.3 |
| | | Aqueous | 13.1 |
| 3 | Stem | Pet.ether | 0.3 |
| | | Ethyl acetate | 7.9 |
| | | Chloroform | 3.2 |
| | | Ethanol | 8.9 |
| | | Aqueous | 7.2 |
| 4 | Stalk | Pet.ether | 1.6 |
| | | Ethyl acetate | 0.8 |
| | | Chloroform | 17 |
| | | Ethanol | 3.1 |
| | | Aqueous | 12.4 |

Table 2: Phytochemical screening of different extracts of *Piper betel*.

| S.No | Plant part | Extracts | Alkaloids | Sterols | Reducing sugar | Glycoside | Flavonoids | Tannins |
|------|------------|---------------|-----------|---------|----------------|-----------|------------|---------|
| 1 | Root | Pet.ether | + | +++ | + | - | - | - |
| | | Ethylacetate | - | - | - | - | + | - |
| | | Chloroform | + | + | + | - | - | - |
| | | Ethanol | - | +++ | ++ | + | + | + |
| | | Aqueous | - | +++ | ++ | + | + | + |
| 2 | Leaf | Pet.ether | + | + | - | - | - | - |
| | | Ethylacetate | - | - | - | - | + | - |
| | | Chloroform | - | ++ | ++ | + | - | - |
| | | Ethanol | +++ | +++ | ++ | ++ | + | ++ |
| | | Aqueous | ++ | - | ++ | ++ | + | ++ |
| 3 | Stem | Pet.ether | - | - | + | - | - | - |
| | | Ethylacetate | - | - | + | - | + | - |
| | | Chloroform | - | - | - | - | - | - |
| | | Ethanol | - | + | + | + | + | - |
| | | Aqueous | - | + | + | + | - | + |
| 4 | Stalk | Pet.ether | + | ++ | + | - | - | - |
| | | Ethyl acetate | - | - | ++ | - | ++ | - |
| | | Chloroform | - | ++ | - | - | - | - |
| | | Ethanol | - | + | - | ++ | + | - |
| | | Aqueous | - | ++ | + | + | - | + |

SUMMARY AND DISCUSSION: Major constituent of pet ether extract of root of *Piper betel* was sterols; ethanol and aqueous extract showed presence of sterols, reducing sugar, glycosides, flavanoids and tannins; Pet ether extract of Leaf of *Piper betel* shown presence of alkaloids and sterols; ethyl acetate extract shown presence of flavanoids; chloroform extract shown presence of sterols and glycosides; ethanol extract showed presence of sterols, glycosides, and flavanoids; and aqueous extract showed sterols, reducing sugars and tannins. Very less constituents were identified in various extract of stem and stalk.

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