Phytochemical screening of ethanolic extract of *Passiflora foetida*(Linn) and medicinal importance

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ABSTRACT

India is enriched with many medicinal plants. *Passiflora foetida* is one of among such medicinal plants. The secondary metabolites present in medicinal plants are used for the treatment of many diseases. The secondary metabolites includes alkaloids, saponins, terpens, plant proteins, glocosides, carbohydrates ect. These phytochemicals have property to reduce the diseases. The ethanolic extract of *Passiflora foetida* linn has many phytochemical compounds. The presence of phytochemical compounds indicates the plant have very importance place in treatment of diseases. Presence of glycosides, saponins, alkaloids, flavonoids, terpens shows the value of *Passiflora foetida* in herbal plants.

Key words: Alkaloids, Ethanol, Glycosides, Flavonoids, Saponins.

Taxonomic position of *Passiflora foetida*:
Domain: Eukaryota
Kingdom: Plantae
Phylum: Spermatophyta
Subphylum: Angiospermae
Class: Dicotyledone
Order: Violales
Family: Passifloraceae
Genus: Passiflora
Species: *Passiflora foetida*.

INTRODUCTION

The genus *Passiflora* belongs to Passifloraceae family and includes the passion fruit, is the largest and the most widespread genus of tropical flora. About 400 species of this genus are grouped into 21 subgenera [8]. More than 350 species have been found in tropical regions and rainforests of South America and 60 of them are edible species. Passion fruit is an important fruit crop in many exotic and subtropical countries due to its edible fruits, ornamental use andmedicinal properties. Some species (*P. edulis, P. Quadrangularis* and *P. ligularis*) are chiefly cultivated for the production of fruit juice. *P. incarnata* is reputed for its sedative properties, and several other species are known for their ethnobotanical uses [13].

In recent years, a significant revival of interest in natural products as a potential source for new medicines has been observed throughout the world. Several modern drugs ~40% in use have been developed from natural products. Nowadays, multiple drug resistance in human pathogenic microorganisms develops due to indiscriminate use of commercial chemical antimicrobial drugs commonly used in the treatment of human diseases. Over the last three centuries, intense efforts have been made to discover clinically useful antimicrobial drugs. [2, 11] The increasing interest on traditional ethno medicine may lead to discovery of novel therapeutic agents. The World Health Organization (2000) estimates that 80% of the population of developing countries still relies on traditional medicines, mostly plant drugs, for their primary health care needs. Herbs are supposed to be safe, but many unsafe and fatal side effects have recently been reported. [12]

The major phytoconstituents of this plant are alkaloids, phenols, glycoside flavonoids, and cyanogenic compounds, passifloricins, polyketides, and alpha-pyrones. [9] One chemical component of a passion flowers Passicol, a polyacetylenic compound has antimicrobial activity [4], which is still not reported in *P. foetida* L. The majority of the active components in this plant are C-glycosyl flavones based on apigenin and luteolin; Harman alkaloids are found in trace amounts along with sucrose and trace amounts of volatile oil. [5, 14, 15]

Traditional medicinal uses of *Passiflora foetida*: Passion flower species have been used in folk medicines against diseases at their native habitats for very long time. Throughout Central America, an infection of leaves from various passiflora species with 2 – lobed leaves are used as a diuretic. India the unripe fruit of *P. foetida* is used as an emetic and a decoction of dried

herbage of *P. foetida* is said to havediuretic effect [20]. The leaves and fruits are useful in treatment of asthma and biliousness. Hysteria can be cured by consumption of leaves and root decoction of *P. foetida* .Giddiness and headache are treated by applying paste of leaves on the head.[6,7] The *P. foetida* is used as or poultices for erysipelas and skin diseases with inflammation in countries like Brazil. Medicinal uses: This species can be helpful in treating digestive problems, including dyspepsia and diarrhea; alternatively, it used as an astringent and expectorant for nervous conditions and spasms.

A good example on the application of Aboriginal herbal knowledge is found through the use of *Ficus opposita* and *Passiflora foetida* by northern coastal communities for the treatment of itchy skin conditions such as scabies and tinea. The leaves of the Ficus are crushed and soaked in water to make a liquid application to relieve the itch. The rough sandpaper-like dry leaves of Ficus are rubbed on the skin for tineaform skin infections such as ringworm. After rubbing the area until the skin begins to bleed, the fruit of *Passiflora foetida* is pulped and smeared over the area and left there for one day. There are many species of Ficus used medicinally throughout Asia. [19] This species can be helpful in treating digestive problems, including dyspepsia and diarrhea; alternatively, it used as an astringent and expectorant for nervous conditions and spasms. Young leaves are used in Surinam and Java as a vegetable. It shows antispasmodic, sedative, anxiolytic and hypotensive activities. [1, 3, 9] The decoction from the leaves and fruits of this plant is used to treat asthma, biliousness and hysteria. The leaf paste of *Passiflora foetida* is applied for headache and to treat skin diseases. Fruit's decoctions of *Passiflora edulis* and *P. foetida* var. albiflora were evaluated for the inhibition of activity of gelatinase MMP-2 and MMP-9. Two metallo-proteases involved in the tumour invasion, metastasis and angiogenesis. Both water extracts, at different concentrations, inhibited the enzymes.

Figure.1.*Passiflora foetida* linn

MATERIALS AND METHODS

Leaves and fruits of *P. foetida* L. was collected from botanical garden of Acharya Nagarjuna University, Guntur, India. The plant was authenticated by a botanist in the university. The fresh leaves and fruits are dried under shady area for two weeks and are taken for further studies.

Phytochemical Analysis: Phytochemical screening of plant extracts was done following the standard procedure by Kokate, (2005) and Harbone (1998). All the prepared plant leaf extracts were subjected to preliminary phytochemical screening for the presence of alkaloids, quinines, resins, tannins, fixed oils, flavanoids, fats, saponins, phenolic compounds, Proteins and carboxylic acids the study of phytochemical analysis, the ethanol extract of the plant leaves was prepared according to standard methods. The plant leaves were air dried and powdered. Transferred the powdered material into solvent extractor and extracted it with 95% ethanol and aqueous solution for 72 h. The extract was obtained as a brown gummy solid. The extract was stored and used for photochemical screening.

Tests for Reducing Sugars:

Benedicts test: 0.5 ml of the extract was placed in a test tube and then 5 ml Benedict's solution was added to it, boiled for 5 min and allowed to cool spontaneously. Red, yellow or green solution is considered as an indication for the presence of reducing sugars.

Fehling's Test: 2 ml of the extract was added in 1 ml of a mixture of equal volumes of Fehling's solutions A and B, and was boiled for few min. Brick red precipitate is considered as an indication for the presence of reducing sugars.

Tests for Tannins:

Ferric Chloride Test: 5 ml of the extract was placed in a test tube and then 1 ml of 5% Ferric chloride solution was added to it. Deep blue colour is considered as an indication for the presence of tannins and phenolic compounds.

Potassium dichromate test: 5 ml of the extract was placed in a test tube and then 1 ml of 10% potassium dichromate solution was added. Red precipitate is considered as an indication for the presence of tannins and phenolic compounds.

Test for Flavonoids 5 ml of 95% ethanol, few drops of concentrated hydrochloric acid and 0.5 gm magnesium turnings were added to 5 ml of the extract. Pink colour is considered as an indication for the presence of flavonoids.

Test for Saponins: 1 ml of the extract was placed in a graduated cylinder and was diluted to 20 ml with distilled water and shaken gently for 15 min. Persistent foam is considered as an indication for the presence of saponin glycosides.

Tests for Steroids:

Libermann-Burchard test: 1 ml of the extract was placed in a test tube and then 2 ml Libermann-Burchard reagent was added to it. Green colour solution is considered as an indication for the presence of steroids.

Salkowski reaction: 2 ml of the extract was placed in a test tube and then 2 ml of chloroform and 2 ml of concentrated sulphuric acid were added to it and shaken well. Chloroform layer appearing red and acid layer showing greenish yellow fluorescence is considered as an indication for the presence of steroids.

Tests for Alkaloids:

Mayer's test: 2 ml of the extract and 0.2 ml of dilute hydrochloric acid were taken in a test tube and 1ml of Mayer's reagent was added to it. Formation of a yellow coloured precipitate indicates the presence of alkaloids.

Dragendroff's test: 2 ml of the extract and 0.2 ml of dilute hydrochloric acid were placed in a test tube and then 1 ml Dragendroff's reagent was added. Formation of orange brown precipitate indicates the presence of alkaloids.

Wagner's test: 2 ml of the extract and 0.2 ml of dilute hydrochloric acid were placed in a test tube. Then 1 ml of iodine solution (Wagner's reagent) was added. Formation of brown/reddish precipitate indicates the presence of alkaloids.

Hager's test: 2 ml solution of the extract and 0.2 ml of dilute hydrochloric acid were placed in a test tube. Then 1 ml of picric acid solution (Hager's reagent) was added. Formation of yellow coloured precipitate indicates the presence of alkaloids.

Tests for Glycosides: A small amount of extract was taken in 1 ml water. Then few drops of aqueous sodium hydroxide were added. Yellow precipitate is considered as an indication for the presence of glycosides in a boiling water bath. Brick red precipitate is considered as an indication for the presence of glycosides.

Tests for cyanogenetic glycosides: Guignard reaction or sodium picrate test: 2ml of the extract was taken in a conical flask in another test, a small amount of extract was taken in 1 ml water and boiled with 5 ml Fehling's solution in a boiling water bath. Brick-red precipitate is considered as an indication for the presence of glycosides. In another test, a small amount of extract was boiled with few drops of dilute sulfuric acid, neutralized with sodium hydroxide solution and boiled with 5 ml Fehling's solution and corked. Filter paper strip soaked in 10% picric acid and in 10% sodium carbonate was placed in the slit in the cork. The filter paper turning into brick red or maroon is considered as an indication for the presence of cyanogenetic glycosides.

Test for anthraquinones:

Bontrager's test: About 0.5 g of the extract was taken in order to dry test tube and 5 ml chloroform was added and shaken for 5 min. The extract was filtered, and the filtrate shaken with an equal volume of 100% ammonia solution. A pink violet or red colour in the ammoniacal layer (lower layer) indicates the presence of free anthraquinones.

RESULTS AND DISCUSSION

Table.1.Preliminary phytochemical analysis of extracts

Phytoconstituents	Ethanol	Aqueous
Alkaloids	+	+
Flavonoids	+	+
Saponins	++	+
Tannins	+	--
Glycosides	+++	+
Anthraquinine glycosides	++	+
Carbohydrates	++	+
Decorboxy sugars	+	--
Reducing sugars	+	-
Proteins	++	+
Amino acids	+	-
+Triterpenoids	+	+
Phenolic compounds	+	-
Steroids	+	-

Discussion: Table present above reveals the phytochemical constituents of *Passiflora foetida.* It shows that saponinsm, tannins, cardiac glycosides, alkaloids, anthraquinones, steroids, carbohydrates, reducucing sugars,amino acids,phenolic compounds and flavonoids are present in the plant. This indicates the efficacy of the plant for medicinal uses.

CONCLUSION

The present study shows that the plant *Passiflora foetida* having the phytochemicals like glycosides, alkaloids, saponins, phenolic compounds, carbohydrates, tannins, proteins, amino acids, and triterpenoids. Each phytochemical have its own medicinal property. The presence of more phytochemicals in *Passiflora foetida* indicates that *Passiflora foetida* have many medicinal properties.

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