

Phytochemical Identification and Antioxidant Activity of *Passiflora Foetida* Hexane, Petroleum Ether Flowers Extracts

*Baskaran. K, Dinesh raja. S, Sijo henry, Namitha. V, Safana. A, Abishek. M, Haseera and N, Shalet Varghese,

Department of Biochemistry, Sree Narayana Guru College, Coimbatore, Tamil Nādu, India.

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*Corresponding Author Email: baskar.bio86@gmail.com

Abstract

The objective of this study was to compare the phytochemical composition and antioxidant activity of *Passiflora foetida* flowers extract. The parameters observed in this study were phytochemical compounds including alkaloid, flavonoid, phenolic, sterol, triterpenoid, saponin, tannin, and cardiac glycoside, total phenolic, total flavonoids content and macro, micro elements. *Passiflora* flowers extract has phytochemical compound such as alkaloids, phenolics, flavonoids, saponins, and cardiac glycosides, , total phenol was 96.92 ± 0.18 mg GAE/g sample dry base, total flavonoids were 145.53 ± 1.02 mg CE/g sample dry base, Hence the ethanol and chloroform flower extract of *Passiflora foetida* shows many compounds and may have been used in traditional medicine for prevention of several diseases.

Keywords

Passiflora foetida, phytochemical, Antioxidant

INTRODUCTION

Passiflora foetida, usually called rambusa is a wild plant usually found in the tropical region and found creeping on another plant. *Passiflora foetida* can be eaten raw as lalapan or used as medicine to cure many diseases like fever, headache and asthma (1). *Passiflora foetida* is grouped in the Passifloraceae family and generally grows in humid places like rivers and swamp.

Passiflora foetida can be used as a traditional medicine because it contains phytochemical compounds. The phytochemical compound in *Passiflora foetida* is an alkaloid, phenolic, glycoside, flavonoid and cyanogenic compound that can be used as an antioxidant (2). The major phytoconstituents of this plant are alkaloids, phenols, glycoside flavonoids, and cyanogenic

compounds, passifloricins, polyketides, and alpha pyrones (3). One chemical component of a passion flowers Passicol, a polyacetylenic compound that 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, 6, 7). Traditional medicinal uses of *Passiflora foetida*: Passionflower species have been used in folk medicines against diseases in their native habitats for a 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 have diuretic effect (8). Figure 1

shows the flowers 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 (9,10). 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 is used as an astringent and expectorant for nervous conditions and spasms.



Figure.1 *Passiflora foetida* flowers whole plant

Passiflora foetida has many biological activities such as anti-inflammation, antitumor, anticancer, antimicrobe and many pharmacological activities (11). Therefore, it is necessary to conduct further research on *Passiflora foetida* flowers as a source of antioxidants. This research was conducted to compare the phytochemical compound and antioxidant activity of *Passiflora foetida* flowers extracts.

MATERIALS AND METHOD

Plant material- Identification and authentication

Passiflora foetida flower was selectively removed from the plant in and around areas of Sree Narayana guru college, KG. Chavadi. Coimbatore and identified by a plant taxonomist. BSI/SRC/5/23/2022/Tech/629.

Preparation of *Passiflora foetida* flower extract

Passiflora foetida flower was washed, dried in a hot air oven at 40°C and subsequently ground into powder in an electric grinder. Delipidation was performed with hexane and petroleum ether (60-80°C) overnight. Soxhlation was performed with 95% ethanol. Ethanol was evaporated in a rotary evaporator at 40-50°C under reduced pressure. The yield of the flower extract was around 13.5 % dry weight.

Phytochemical identification

Phytochemical identification was done to determine phytochemical content in samples such as alkaloid, flavonoid, phenolic, sterol, triterpenoid, saponin, tannin, and cardiac glycoside in *Passiflora foetida* leaves and fruits extracts (12).

Total phenol analysis

Total phenol analysis was determined by spectrometry method (13). 100 µl sample was added with 1 ml Folin Ciocalteu 10% and 2 ml Sodium Carbonate 7.5%. The mixture was added with water in a 10 ml volumetric flask and shook. The solution was incubated at ambient temperature for 30 min and the absorbance of the sample was measured at λ 760 nm. The total phenolic content of the sample was stated by gallic acid equivalence (GAE)/g sample dry base.

Total flavonoid analysis

Total flavonoid analysis was determined by the AlCl₃ colorimetry method (14). 100 µl sample was added with 0.3 ml NaNO₂ 5% (b/v), 0.3 ml AlCl₃ 10% (b/v), and 2 ml NaOH 1 M in 10 ml volumetric flask. The mixture shook and diluted with water until volume 10 ml. The absorbance of the sample was measured at λ 510 nm. Total flavonoid content of the sample was stated by catechin equivalence (CE)/g sample dry base.

Mineral concentration

Trace minerals, namely Cu, Co, Fe, Mg, Na, K, Ca, and Zn were estimated in concentrate hexane and petroleum ether extract of *Passiflora foetida* flowers by using an atomic absorption spectrophotometer (AAS 4141, ECIL-Elements, India, Model no. 1381, ESPIO, Japan Accucare™ Magnesium Xylidyl Blue, ECIL-Elements AAS 4141). All the results were expressed as µg mg⁻¹ of extract.

Statistical analysis

All the assays were carried out in triplicate. Experimental results are expressed as mean ±

standard deviation. The results were analyzed using one-way analysis of variance and the group means were compared using Duncan's multiple range tests using SPSS version 16.

RESULTS AND DISCUSSION

Passiflora foetida dried leaves flowers had moisture around respectively. *Passiflora foetida* hexane and petroleum ether flowers extracts contained phytochemical compounds that were shown in Table 1.

Table. 1 shows the Phytochemical screening of *Passiflora foetida* flowers extract

SNo	Qualitative test	<i>Passiflora foetida</i> flowers extract	
		Hexane	Petroleum ether
1	Proteins	-	+
2	Carbohydrates	+	-
3	Phenols	-	+
4	Tannins	+	+
5	Flavonoids	+	+
6	Sapins	-	+
7	Glycosides	+	+
8	Steroids	+	+
9	Terpenoids	-	+
10	Alkaloids	+	-

Data-informed that flowers contained alkaloid, flavonoid, phenolic compound and cardiac glycoside. Terpenoid and sterol were nonpolar compounds and the solvent used to extract was aqua dest which is a polar solvent (15). Tannin is a water-soluble active compound that can be found in the plant. In this study, tannin wasn't detected in both extracts. A different result was obtained from those who found tannin in both extract and found tannin in *Passiflora* flowers (16,17). The difference result was caused by a different place of plant growth that can influence the nutritional value and phytochemical content of plants (18). Total phenol, Flavonoid, is shown in figures 2, 3 respectively. Total phenol and flavonoid of *Passiflora* flowers hexane extract (96.92 ± 0.18 mg GAE/g Sample dry base and 82.01 ± 0.10 mg CE/g Sample dry base respectively) was higher compared with *Passiflora* flowers petroleum ether extract (145.53 ± 1.02 mg GAE/g Sample dry base and 120.56 ± 0.27 mg CE/g Sample dry base respectively). Total phenolic content of determined by some factors like enzyme activity of Phenylalanine Ammonia-Lyase (PAL) and Chalcone Synthase (CHS) in plants and the number of free hydroxyl group in the sample (19,20). The formation of flavonoids is influenced by the action of CHS enzymes that form

chalcone compounds which are subsequently isomerized by CHI enzyme (chalcone isomerase) into another flavanol compounds (21). Total phenol and flavonoid from *Passiflora* flowers extracts were different because a different part of the plant has different functions and nutritional content. Flowers have a function for photosynthesis and place to storage nutrition meanwhile fruit has the function to protect the seeds by surrounding it with flesh containing mineral, simple organic compound, and substrate and facilitate its dispersal (22). Trace minerals maintain various reactions of the body which help to construct and maintain DNA, required for the growth and repair of body tissues, important element of ligaments and tendons (23). Macro and micro minerals play important role in the formation and function of bones, muscles and prevents chronic disorders, high blood pressure and depression also Mg plays important role in enzyme activity, deficiency interfere with transmission of nerve and muscle, impulses, causing irritability and nervousness, prevent heart diseases (24). In the present study *Passiflora foetida* hexane and petroleum ether both flowers extract macro and micro highly significance (Figures 4,5).

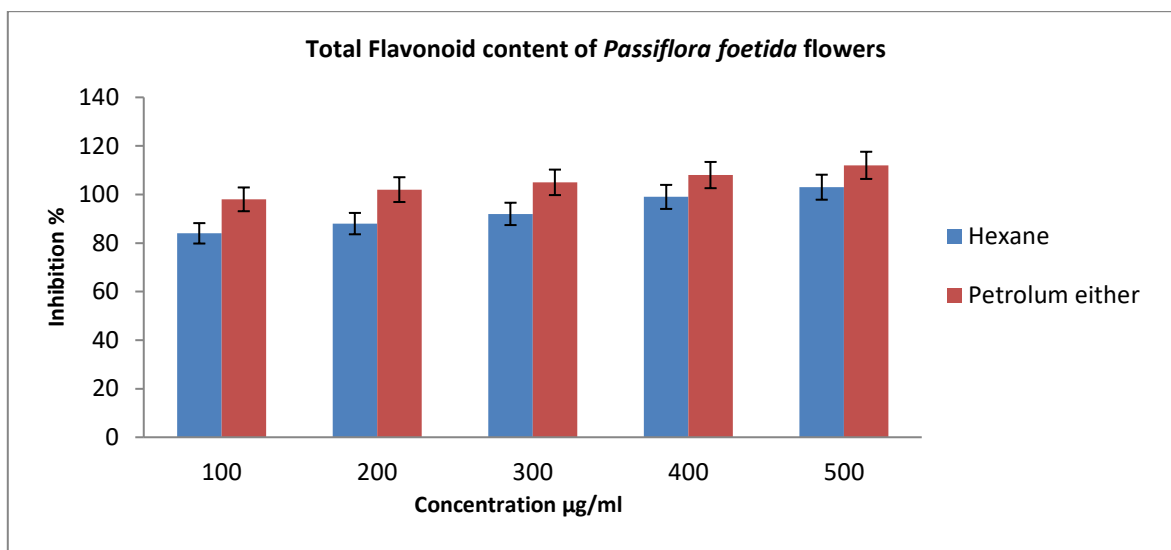


Figure.2 shows the total flavonoid content of *Passiflora foetida* flowers extract.

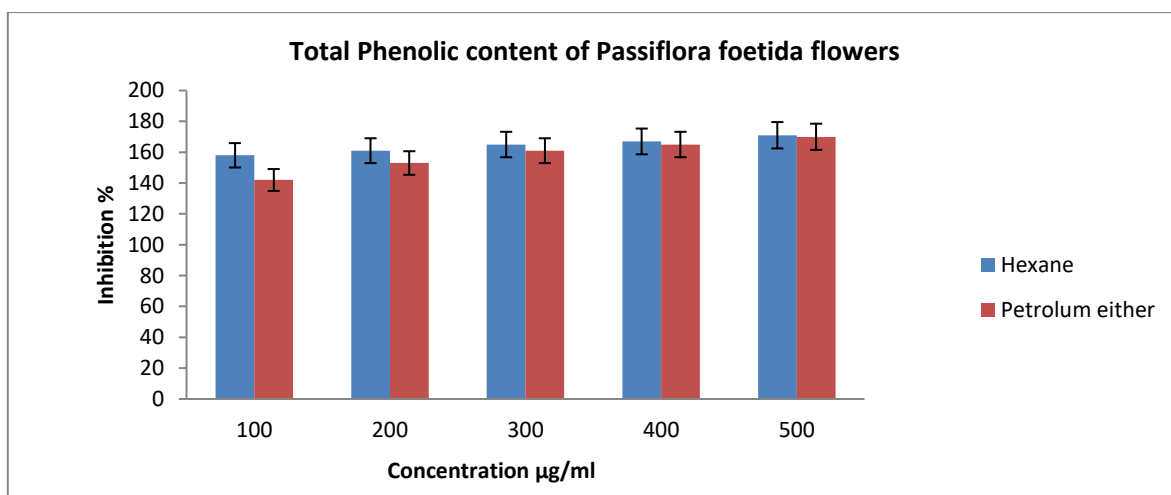


Figure.3 shows the total phenolic content of *Passiflora foetida* flowers extract.

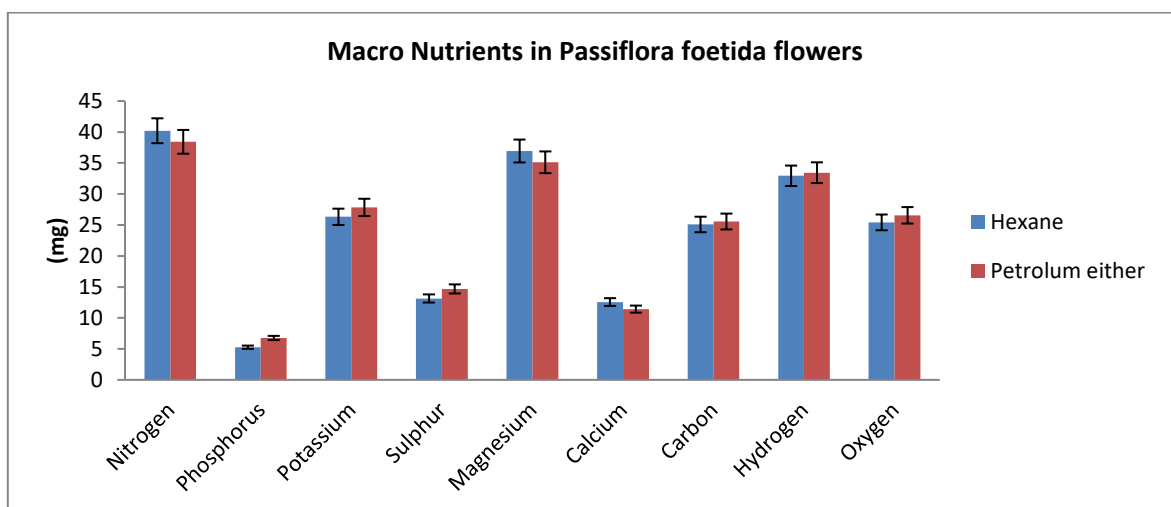


Figure.4 shows the Macro nutrients *Passiflora foetida* flowers extract.

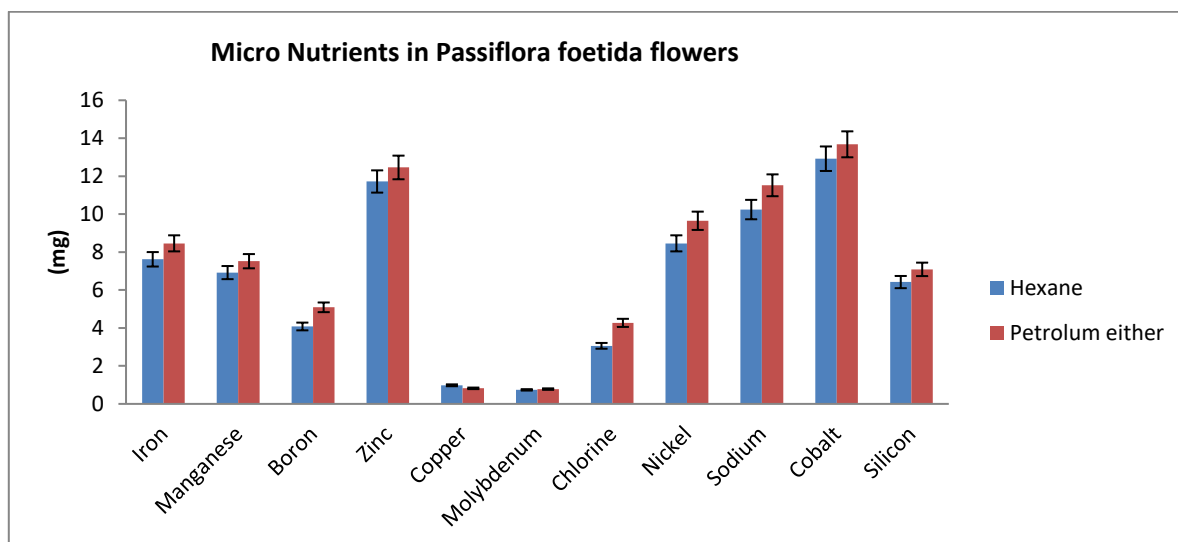


Figure.5 shows the Micronutrients *Passiflora foetida* flowers extract.

CONCLUSIONS

The present study shows that the plant *Passiflora foetida* has phytochemicals like glycosides, alkaloids, saponins, phenolic compounds, carbohydrates, tannins, proteins, amino acids, and triterpenoids. Each phytochemical has its own medicinal property. The result obtained in this study showed that *Passiflora* flowers extract has higher total phenol, total flavonoid and Macro and micro minerals compared with *Passiflora* flowers extract.

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