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PHYTOCHEMICAL SCREENING, TOTAL POLYPHENOL, FLAVONOID CONTENT AND MINERALS OF *HISBICUSVITIFOLIUS* WATER AND ACETONE FLOWERS EXTRACTS

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ABSTRACT

The objective of this study was to compare the phytochemical composition and antioxidant activity of *Hisbicusvitifolius* 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. *Hisbicusvitifolius* flowers extract has phytochemical compound such as alkaloids, phenolics, flavonoids, saponins and cardiac glycosides, total phenol was 110.92 ± 0.18 mg GAE/g sample dry base, total flavonoids were 148.53 ± 1.02 mg CE/g sample dry base, hence the water and acetone flower extract of *Hisbicusvitifolius* shows many compounds and may have been used in traditional medicine for prevention of several diseases.

KEYWORDS

Hisbicusvitifolius, Phytochemical, Antioxidant and Traditional medicine.

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INTRODUCTON

Plants are one of the most important sources of medicines. The medicinal plants are extensively utilized throughout the world in traditional system of medicines “Ayurveda”¹. Medicinal plants continue to be an important therapeutic aid for alleviating the ailments of human kinds. India is rich source of medicinal plants and is called “Botanical Garden of the World” with enormous wealth of biodiversity. There are almost 45,000 plant species recorded in India so far² of which 7,500 species have been used for medicinal purposes³. The use of plant-based natural products

in the treatment and prevention of diseases and health enhancement has led to the significant attention of the scientific community and the public nowadays. The availability of these medicinal plants provides a cost-effective source with lesser side effects to develop new drugs has drawn much attention among the researchers. Plant-based traditional medicine has a long history since ancient civilization and uses plant materials as a major ingredient in synthesizing drugs⁴. Figure No.1 shows the widely accepted fact that the rapid development of deriving pharmacologically active drugs from medicinal herbs has a tremendous impact on current medicinal practices. Therefore, current research of exogenous natural antioxidants focuses on herbs. Spices and herbs have been identified as sources of diverse phytochemicals and many of them have potent antioxidant activity. The aim of this research is to use phytochemical analysis to evaluate antioxidant activity of chloroform and ethyl acetate extracts of the *Hisbicusvitifolius L* flower.

MATERIAL AND METHODS

Plant material- Identification and authentication

Hisbicusvitifolius 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/631.

Preparation of *Passiflora foetida* flower extract

Hisbicusvitifolius 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 water and acetone (60-80°C) for 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% of 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 *Hisbicusvitifolius* flowers extracts⁵.

Total phenol analysis

Total phenol analysis was determined by spectrometry method⁶. 100µl sample was added with 1ml Folin Ciocalteu 10% and 2ml Sodium Carbonate 7.5%. The mixture was added with water in a 10ml volumetric flask and shook. The solution was incubated at ambient temperature for 30 min and the absorbance of the sample was measured at λ 760nm. 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 method⁷. 100µl sample was added with 0.3ml NaNO₂ 5% (b/v), 0.3ml AlCl₃ 10% (b/v), and 2ml NaOH 1M in 10ml volumetric flask. The mixture shook and diluted with water until volume 10ml. The absorbance of the sample was measured at λ 510nm. 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 water and acetone extract of *Hisbicusvitifolius* flowers by using an atomic absorption spectrophotometer (AAS 4141, ECIL-Elements, India, Model No.1381, ESPIO, Japan Accucare TM 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 \pm 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

Medicinal plants are rich in essential phytochemicals and many secondary plant metabolites accountable for the antimicrobial, antiinflammatory effects, and various other known biological activities. Freshly prepared ethanolic extracts of *Hisbicusvitifolius* were subjected to phytochemical analysis for the presence of various primary and secondary metabolites) responsible for the antibacterial properties. Phytochemical

screening of the plant extracts under this study revealed a similar phytochemical profile, as depicted in Table No.1. Alkaloids, flavonoids, triterpenes, tannins and unsaturated steroids are the most critical types of phytochemicals found in these species. Previous studies have also reported the absence of saponins in the curry leaf species under the study⁸. Alkaloids, flavonoids, polyphenols and tannins were identified in several other investigations of the phytoconstituents of different plant parts of *Hisbicusvitifolius*. Plant-derived flavonoids possess antidiarrheal, antimicrobial, antioxidant, and anti-inflammatory properties. Therefore, the individual phytochemicals possess various biological activities, including antimicrobial, antioxidant, anti-inflammatory, antiplasmodial and anticancer activities⁹. The total phenolic content (TPC) of the acetone leaf extracts of *Hisbicusvitifolius* was determined by the Folin Ciocalteu method, as depicted in Figure No.2. Both species under study were rich in polyphenol content, and the TPC of the tested plants was significantly different ($p < 0.05$). Flavonoids are another group of phenolic compounds present in medicinal plants, exhibit antioxidant activity¹⁰. The results in Figure No.3 showed that the TFC in actone extract of *Hisbicusvitifolius* was in the range of 9.16-9.75mg QE/g of extract. *Hisbicusvitifolius* extract showed the highest TFC value, significantly different from *Hisbicusvitifolius* ($p < 0.05$).

The reported TPC and TFC of *Hisbicusvitifolius* were slightly lower in acetone extract, respectively¹¹. The successful isolation of phenolic and flavonoid compounds may depend on various factors, sample size, storage conditions, weather, extraction method, and the presence of any interfering substances and the solvent. Aqueous methanol and ethanol at various percentages have been widely used as solvents to extract phenolic compounds from *Hisbicusvitifolius*.

Macro and micro minerls plays 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 diseases¹². In the present study *Hisbicusvitifolius* hexane and petroleum ether both flowers extracts macro and micro highly significance (Figures No.4 and Figure No.5).

Table No.1: Shows the Phytochemical screening of *Hisbicusvitifolius* flowers extract

S.No	Qualitative test	<i>Hisbicusvitifolius</i> flowers extract	
		Water	Acetone
1	Proteins	+	-
2	Carbohydrates	+	+
3	Phenols	+	+
4	Tannins	-	-
5	Flavonoids	+	+
6	Sapoinis	-	+
7	Glycosides	+	-
8	Steroids	-	+
9	Terpenoids	-	+
10	Alkaloids	+	-



Figure No.1: *Hibiscus vitifolius* flowers wholeplant

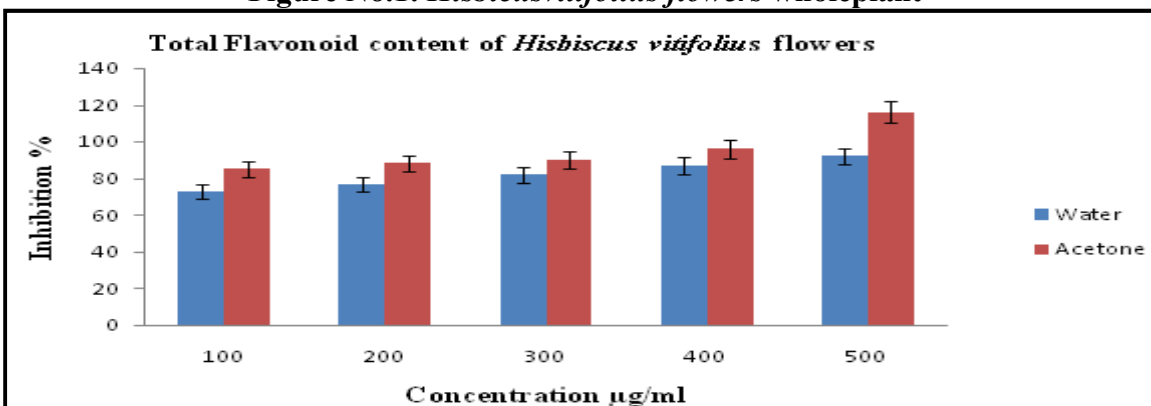


Figure No.2: Shows the total flavonoid content *Hibiscus vitifolius* flowers extract

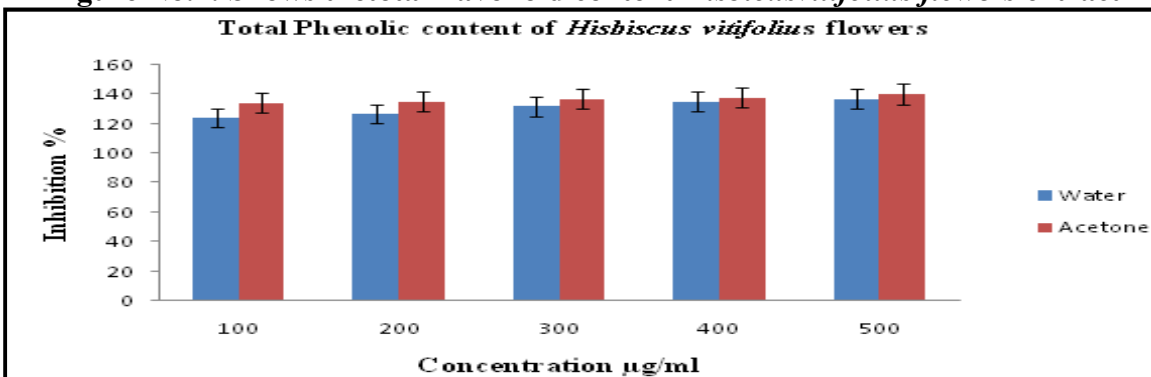


Figure No.3: Shows the total phenolic content *Hibiscus vitifolius* flowers extract

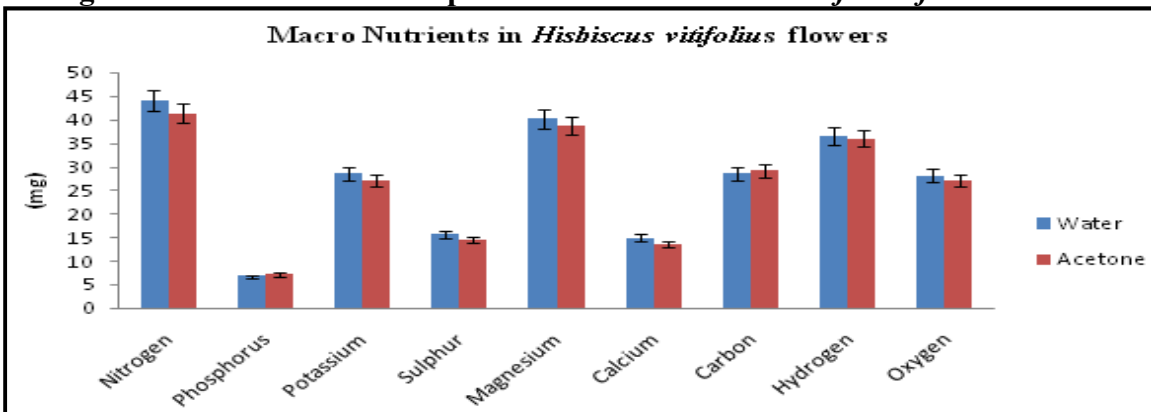


Figure No.4: Shows the Macro nutrients *Hibiscus vitifolius* flowers extract

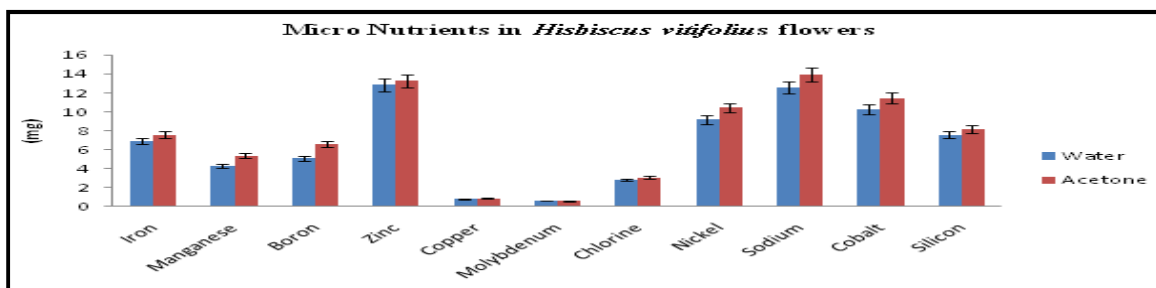


Figure No.5: Shows the Micro nutrients *Hibiscusvitifolius* flowers extract

CONCLUSION

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

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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