Research Article **ISSN: 2349 – 7106**

Asian Journal of Research in Chemistry and Pharmaceutical Sciences

Journal home page: www.ajrcps.com

https://doi.org/10.36673/AJRCPS.2022.v10.i04.A20

PHYTOCHEMICAL SCREENING, TOTAL POLYPHENOL, FLAVONOID CONTENT AND MINERALS OF *IPOMOEA PURPUREA* ETHYL ACETATE AND CHLOROFORM FLOWERS EXTRACTS

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ABSTRACT

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

KEYWORDS

Ipomoea purpurea, Phytochemical and Antioxidant.

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INTRODUCTON

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 drugs[1].

Flavonoids represent the most common and widely distributed group of plant phenolics[2] and are

abundant in foods; quercetin and rutin are the flavonoids most abundantly consumed[3]. Musa paradisiaca is one of the well known plants of the Musaeae family that have been used in traditional medicine since hundred years to alleviate various diseases and health problems. Active constituent presence in the plants materials might be responsible to the beneficial of human health. The most important of these bioactive compounds of plants are alkaloids, flavonoids, tannins and phenolic compounds[4]. Ethnomedicinal survey around the world revealed that the flowers of Musa spp. have been used to treat many illnesses. Its flowers have been traditionally used to alleviate menorrhagia, dysentery, diabetes mellitus[5], heart pain, diarrhea, stomach cramps and infantile malnutrition[6]. It was reported that the extracts of the flowers possess medicinal properties for illness such as diabetes mellitus, anaemia[7] and malaria[8]. Phenolics are the largest group of phytochemicals that account for most of the antioxidant activity in plants or plant products[9].

Figure1. Shows the *Ipomoea purpurea* L. (Convolvulaceae), known as morning glory, is an annual twiner with a thin and frail stem[10]. It is typically found in the untamed areas of the Chattogram Hill Tracts in Bangladesh. According to India's indigenous medicine system, it belongs to anti-psychotic, antioxidant, anti-cancer, antimicrobial, oxytocic and anti-inflammatory activities. However, no ethno pharmacological study has been conducted on its flowers.

MATERIAL AND METHODS

Plant material- Identification and authentication

Ipomoea purpurea flower was selectively removed from the plant in and around areas of Pudussery, Palakkad, Kerala and identified by a plant taxonomist. BSI/SRC/5/23/2022/Tech/628.

Preparation of *Ipomoea purpurea* flower extract

Ipomoea purpurea 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 ethyl acetate and chloroform soxhalation was performed with 95% chloroform and ethyl acetate 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 screening

The filtrated SP crude extract (200mL) was concentrated under reduced pressure and partitioned by sequential extractions with ethyl acetate and chloroform 70% (V/V). These two fractions were evaluated by phytochemical qualitative reactions for usual plant secondary metabolites. The screening was performed for triterpenes/steroids, alkaloids, coumarins, flavonoids, saponins, tannins, and phenolic acids[11-16]. The color intensity or the precipitate formation was used as analytical responses to these tests.

Total phenol analysis

Total phenol analysis was determined by spectrometry method[17]. 100µl sample was added with 1ml Folin Ciocalteu10% 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 $AlCl_3$ colorimetry method[18]. 100µl sample was added with 0.3ml $NaNO_2$ 5% (b/v), 0.3ml $AlCl_3$ 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 ethyl acetate and chloroform extract of *Ipomoea purpurea* 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 ± 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

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 study[19]. Alkaloids, flavonoids, polyphenols, and tannins were identified in several other investigations of the phytoconstituents of different plant parts of *Ipomoea purpurea*. 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 activities[20]. The total phenolic content (TPC) of the ethyl acetate and chloroform flower extracts of *Ipomoea purpurea* 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 ($p < 0.05$). While in comparison to the literature, it clearly shows that *Ipomoea purpurea* extract has a similar or a slightly higher value of phenolic content[21,22].

Flavonoids are another group of phenolic compounds present in medicinal plants, exhibit antioxidant activity[23]. The results in Figure No.3 showed that the TFC in ethyl acetate and chloroform extract of *Ipomoea purpurea* was in the range of 9.16-9.75mg QE/g of extract. *Ipomoea purpurea* extract showed the highest TFC value ($p < 0.05$). The reported TPC and TFC of *Ipomoea purpurea* were slightly lower in ethyl acetate and chloroform extract, respectively[24]. 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 *Ipomoea purpurea*. However, no single solvent or a mixture of solvents was reported to extract phenolic compounds from these two species effectively. Although the total phenolic content of *Ipomoea purpurea* was higher than that of *Ipomoea purpurea* (Table No.3), there was only a slight difference in the total flavonoid content of the two species. Therefore, these results indicate that the phenolic substances' quality may also have contributed to the higher antioxidant activity. Furthermore, various other phytochemicals such as terpenes are also known to be the major constituent exerting antioxidant activity, as confirmed by different comparative studies of *Ipomoea purpurea*[25].

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[26]. 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 diseases. In the present study *Ipomoea purpurea* ethyl acetate and chloroform ether both flowers extracts macro and micro highly significance (Figure No.4 and Figure No.5).

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

S.No	Qualitative test	*Ipomoea purpurea flowers* extract	
		Ethyl acetate	Chloroform
1	Proteins	-	+
2	Carbohydrates	-	-
3	Phenols	+	+
4	Tannins	+	-
5	Flavonoids	+	+
6	Sapoins	-	-
7	Glycosides	-	-
8	Steroids	+	+
9	Terpenoids	+	+
10	Alkaloids	-	+

Figure No.1: *Ipomoea purpurea flowers* whole plant

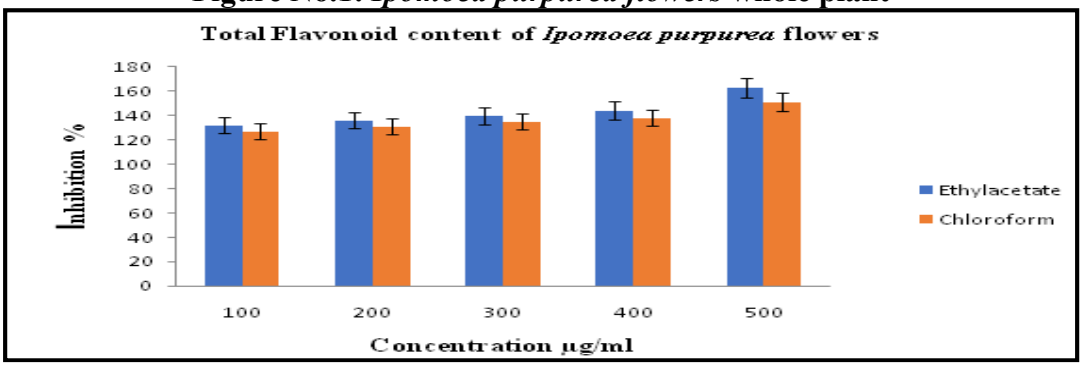

Figure No.2: Shows the total flavonoid content *Ipomoea purpurea flowers* extract

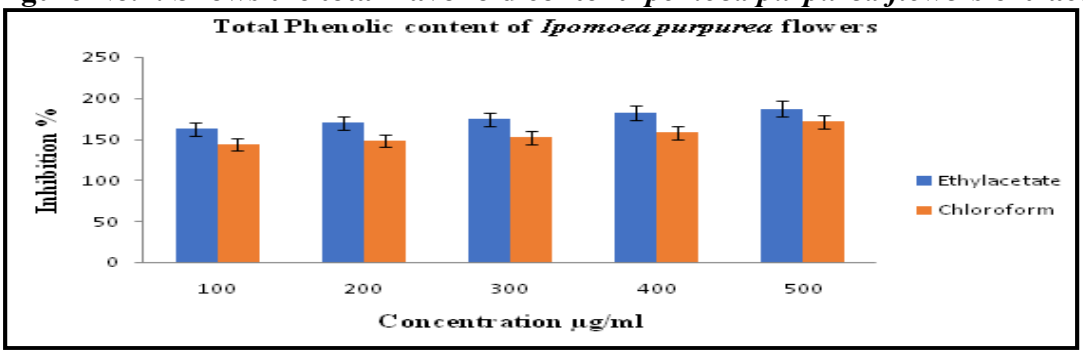

Figure No.3: Shows the total phenolic content *Ipomoea purpurea flowers* extract

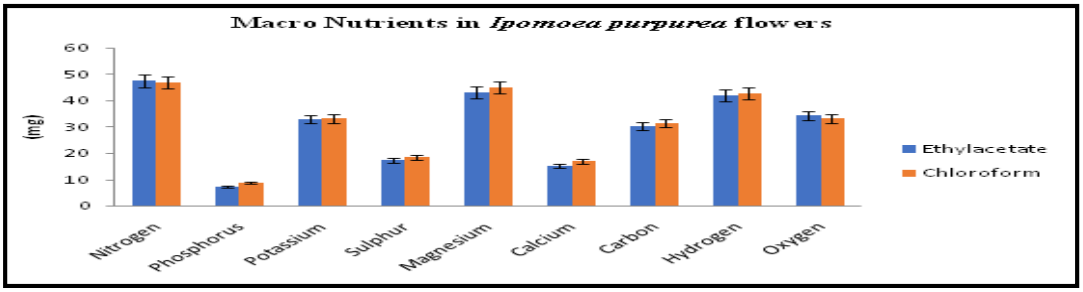

Figure No.4: Shows the Macro nutrients *Ipomoea purpurea flowers* extract

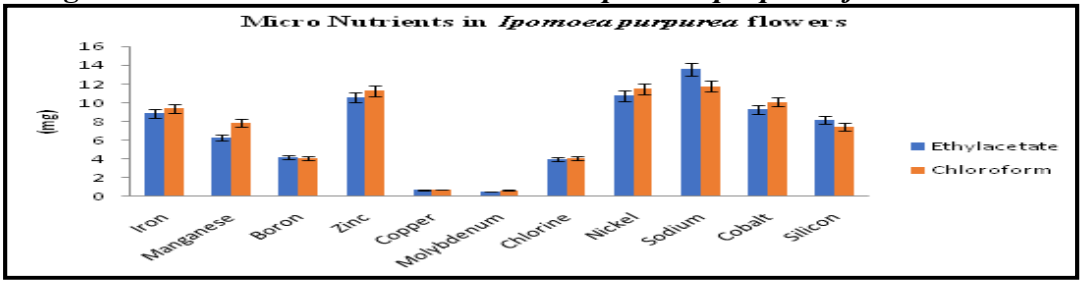

Figure No.5: Shows the Micro nutrients *Ipomoea purpurea flowers* extract

CONCLUSION

The present study shows that the plant *Ipomoea purpurea* 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 *Ipomoea purpurea* ethyl acetate and chloroformflowers extract has higher total phenol, total flavonoid and Macro and micro minerls compared with *Ipomoea purpurea* flowers extract.

ACKNOWLEDGEMENT

We thank Dr. D. Kaplana. Principal, Sree Narayana Guru College, for the facilities provided is gratefully acknowledged.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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Please cite this article in press as: Baskaran K *et al*. Phytochemical screening, total polyphenol, flavonoid content and minerals of *Ipomoea purpurea* ethyl acetate and chloroform flowers extracts, *Asian Journal of Research in Chemistry and Pharmaceutical Sciences,* 10(4), 2022, 222-227.