


PHYTOCHEMICAL ANALYSIS OF *BEGONIA CORDIFOLIA*Amutha S^{1*} and Sree Devi Kumari T²¹Register Number: 8172, Research Centre: Vivekananda College, Agasteeswaram- 629 701 Kanyakumari – Dist., Tamilnadu, India.²Assistant Professor, Department of Zoology Vivekananda College, Agasteeswaram- 629 701 Kanyakumari – Dist., Tamilnadu, India. Affiliated to Manonmaniam Sundararar University, Abishekapatti, Tirunelveli- 627012, Tamilnadu, India.

ABSTRACT

The present work enumerates the preliminary phytochemical analysis, fluorescence analysis, physicochemical character and quantitative estimation of leaf extract of *Begonia cordifolia*, which belongs to Begoniaceae. The leaf sample of *B. cordifolia* was extracted using different solvents such as Hexane, Ethyl acetate, Acetone, Methanol and Aqueous. The preliminary phytochemicals, saponin, protein, phenol, steroid, catichin, triterpenoids, sugar, and reducing sugar were predominantly present in sample. In fluorescence analysis, the leaf powder showed different colours in various extracts. The physicochemical determinations of the methanol extract of *Begonia cordifolia* leaves showed the maximum extractive values and hexane extract showed the minimum value. The quantitative analysis of *B. cordifolia* leaves contained high quantity of phenols and flavonoids.

Keywords :- *Begonia cordifolia*, Fluorescence analysis, Physicochemical character.

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INTRODUCTION

The traditional use of medicinal plants is most important for developing countries, as a normative basis for the maintenance of good health, has been widely observed [1]. The medicinal plants are highly useful for detecting as well as curing various diseases from time immemorial because of the presence of phytochemical constituents [2]. The phytochemicals which are naturally present in the medicinal plants possess a very great amount of defense mechanism which in turn protects the mankind from various diseases. They are primary and secondary compounds. The primary constituents consist of chlorophyll, proteins and common sugar whereas the secondary compounds consist of terpenoid, alkaloids and phenolic compounds[3]. The presence of a phytochemical may lead to further isolation, purification and characterization. Consequently, it can be used as the basis for a new pharmaceutical product. With this background,

the present paper enumerates the phytochemical estimation of leaf extract of *Begonia cordifolia* using different solvent system.

MATERIALS AND METHODS

The fresh leaves of *Begonia cordifolia* were collected from Courtallam hills, Tirunelveli District, Tamil Nadu during the month of August 2015 and their identity was confirmed through literature available in the Department of Botany, St.Xavier's College (Autonomous), Palayamkottai, TamilNadu. The leaves of *Begonia cordifolia* were washed thoroughly and blotted on the blotting paper, then spreaded out at room temperature in shade to remove the excess water contents. The shade dried plant samples were ground to fine powder using mechanical grinder. The powdered samples were stored at 4°C for further use. The dried and powdered leaves of *Begonia cordifolia* were extracted successively with 100 g

of plant powder and 500 ml of Hexane, Ethyl Acetate, Acetone, Methanol and Distilled water each by using soxhlet extractor for 8 hours at a temperature not exceeding the boiling point of the solvent. The extracts were filtered using Whatman (No.1) filter paper and then concentrated in vacuum at 40°C using rotary evaporator. The residues obtained were stored in a freezer for further tests.

Phytochemical screening

The freshly prepared crude extracts of *Begonia cordifolia* was qualitatively tested for the presence of chemical constituents. These were identified by characteristic color changes using standard procedures [4].

Fluorescence Analysis

The selected plant powder were examined under ordinary white light and in ultra-violet light (UV 255nm and 365nm). The fluorescent characters were determined using the methods of Chase and Pratt (1949) [5]. These powders were also treated with various chemical reagents viz., acetone, ethyl alcohol, 1N NaOH, 1N HCl, 50% H₂SO₄ and 50% HNO₃ and subsequently the changes in colour were recorded.

Determination of the Physico-Chemical Characters

The physico-chemical characters such as total ash, acid insoluble ash, water soluble ash, sulphated ash, moisture content, alcohol soluble extractive values and water soluble extractive values were determined by employing standard methods of analysis as described in *Pharmacopoeia of India* [6]. The percentages of extractive values in various solvents were also determined and presented.

RESULTS

The preliminary phytochemical screening of *Begonia cordifolia* leaves showed that the plant contains different types of chemical constituents and the results are presented in Table 1. Saponin, protein, phenol, steroid, catachin, triterpenoids, sugar, and reducing sugar were predominantly present in selected samples. Majority of compound like tannin, triterpenoids, flavones, alkaloid,

protein, phenol, catachin, anthroquinone, sugar and reducing sugar present in methonolic extract. Saponin, phenol, steroid, triterpenoids, catachin, reducing sugar were reported in Hexane extract and Ethyl acetate extract. Saponin, protein, phenol, steroid, triterpenoids, catachin, sugar and reducing sugar were present in acetone extract. In addition, amino acids were also reported in acetone extract. The fluorescence properties of *Begonia cordifolia* leaves have been studied and the colour changes were also observed. The results are presented in Table 2. Owing to the emission of the fluorescent light, the leaf powder showed different colours in various extracts.

The physico-chemical determinations of powder *Begonia cordifolia* leaves are shown in the table 3. The amount of total ash value is 10 %, water soluble ash is 6.25%, acid insoluble ash is 8.8 %, sulphated ash is 22.5%, Moisture content is 68.25%, Water soluble extractive is 4.4%, alcohol soluble extractive is 6.6%, Hexane extract is 2.9%, Ethyl acetate extract is 5.5%, Acetone extract is 6.3% and Methanol extract is 7.8%. The percentages of extractive values (successive extraction) in different solvents vary from one another. The methanol extracts show the maximum extractive value and Hexane extracts show the minimum extractive value (Table 3).

The high quantity of phenols and flavonoids are found in *Begonia cordifolia* leaves. The values of glycosides and serpentines are found only in a very meagre quantity in this plant. Carbohydrates are the more abundant than all the organic compounds in the biosphere. The amount of starch is high in this plant (37.33 mg/gdw). The total sugar content (3.05 mg/g dw). The total alkaloids as well as the flavonoid content of methanol extract of the plant leaf is 3.56 and 3.65 mg/kg⁻¹ respectively. In the present findings, the presence of flavonoid has been reported in the selected species. The phenolic content of the plant extract is 1.39 mg/g/dry wt. The existence of amino acids also has been reported in this plant leaf and the quantity of its content 2.30 mg/g dw. The richest source of total alkaloid (3.56 mg/kg/dry wt) were reported in this plant (Table 4).

Table 1: Preliminary phytochemical analysis

S. No	Extract	Saponin	Tannin	Alkaloid	Flavones	Amino acids	Protein	Phenol	Steroid	Triterpenoid	Catachin	Anthoquinone	Sugar	Reducing Sugar	Aromatic Acids
1.	Hexane extract	+	-	-	-	-	-	+	+	+	+	-	+	+	-
2.	Ethyl acetate extract	+	-	-	-	-	+	+	+	+	+	-	+	+	-
3.	Acetone	+	-	-	-	+	+	+	+	+	+	-	+	+	-
4.	Methanol	-	+	+	+	-	+	+	-	+	+	+	+	+	-
5.	Water	+	+	+	+	-	-	+	-	-	+	+	+	+	-

+ present, - absent

Table 2: Fluorescence characters of leaf powder extract of *B. cordifolia*(Wight) Thw.

S. No.	Treatment	Leaf		
		Visible light	Short UV light	Long UV light
1.	Powder + acetone	Yellowish Green	Florescent Green	Reddish Orange
2.	Powder + ethyl alcohol	Yellowish Green	Florescent Green	Reddish Orange
3.	Powder + 50% H ₂ SO ₄	Yellowish Green	Dark Green	Dark Red
4.	Powder + 1N HCl	Yellowish Green	Dark Green	Dark Red
5.	Powder + 1N NaOH	Yellowish Green	Dark Green	Dark Red
6.	Powder + 50% HNO ₃	Reddish Orange	Florescent Green	Dark Red
7.	Hexane extract	Greenish Red	Dark Green	Reddish Orange
8.	Ethyl acetate extract	Greenish Red	Dark Green	Reddish Orange
9.	Acetone extract	Greenish Red	Dark Green	Reddish Orange
10.	Methanol extract	Light Yellow	Florescent Green	Yellowish Red
11.	Powder + H ₂ O	Light Brown	Green	Reddish Orange

Table 3: Physico – chemical characters of leaf of *B. cordifolia* (Wight) Thw.

S. No	Type of Ash	% of Ash
1.	Total ash	10±0.21
2.	Water soluble ash	6.25±0.38
3.	Acid insoluble ash	8.8±0.71
4.	Sulphated ash	22.5±0.26
5.	Moisture content	68.25±0.58

Table 4: Quantitative estimation of leaf of *B. cordifolia* (Wight) Thw.

S.No	Name of the extract	Extractive Value(%)
1.	Water soluble extractive	4.4±0.16
2.	Alcohol soluble extractive	6.6±0.12
3.	Hexane extract	2.9±0.14
4.	Ethyl acetate extract	5.5±0.16
5.	Acetone extract	6.3±0.15
6.	Methanol extract	7.8±0.74

Values are means of three independent analyses of the extract ± standard deviation.

DISCUSSION

Plants are important source of functional components for the development of new chemotherapeutic agents. As phytochemicals often play an important role in plant defence against prey, microorganism, stress as well as interspecies protections, these plant components have been used as drugs for millennia. Hence, phytochemicals screening serves as the initial step in predicting the types of potential active compounds from plants.

Pharmacognosy is a simple and reliable foot, by which complete information of the crude drug can be obtained [7-9]. The evaluation of a crude drug is an integral part of establishing the correct identification of plant material. For this, physiochemical parameters must be determined. The ash values are generally index of the purity as well as identify of the drug.

Herbal medicines are free from side effects, adverse effects and they are economical and easily available will be beneficial over the centuries. Qualitative phytochemical studies on the *Begonia laciniata* plant revealed flavonoids, alkaloids, triterpenoids, glycosides and steroids which is similar to our study. Wadood *et al.*,

2013 analysed the phytochemicals in ten different medicinal plants such as *Acacia nilotica*, *Psidium guajava*, *Luffa cylindrical*, *Morus alba*, *Morus nigra*, *Monordia charantia*, *Fagonia cretica*, *Punica granatum*, *Ficus palmate* and *Prunus persica* and found the presence of terpenoids, tannins, reducing sugar, flavonoids and alkaloids.

The present result indicates that *Begonia cordifolia* hold promises as source of pharmaceutically important phytochemicals. Alkaloids generally present in root and bark of *Dennetia tripefala* play some metabolic role and control development in living system. They are also involved in protective function in animals and are used as medicine especially the steroidal alkaloids. Tannins are known to inhibit pathogenic fungi. The flavonoids and phenolic compounds in *Dennetia tripefala* have been reported to exert multiple biological effects including antioxidant, free radical scavenging abilities, anti inflammatory, anti carcinogenic etc [3].

Analysis of previous literature report [3,10,11] indicated the ethno botanical importance, phytochemical and pharmacological properties of different *Begonia*

species. Haydon (1975) studied the photophysical characters of coumarins. Hydroxy methyl coumarin fluoresced in the 420-440 nm when observed in different solvents with increasing polarity [12]. The fluorescent analysis of the crude drugs of *B. cordifolia* exhibited clear fluorescence behavior at different radiations in the event of it can be taken as standard fluorescent pattern. Analysis of the previous literature reports of the Solomon & Johnson, 2012; Jagtap *et al.*, 2009 and Ramesh *et al.*, 2002 [13,14,15] indicated the ethno botanical importance and also the phytochemical and pharmacological properties of different Begonia species.

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CONCLUSION

Phytochemicals found in leaf extract of *B.cordifolia* indicates their high quality of potentiality that starts as a source of principles that may supply novel medicines. Studies are in progress to have further evaluation on the mechanisms of action of *B. cordifolia* leaf extracts on some organisms associated with fish. The continuous research work on the same topic will emphasize the isolation and characterization of active principles responsible for bio-efficacy and bioactivity.

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