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PHYTOCHEMICAL SCREENING OF THE LEAF AND FLOWER EXTRACTS OF FIVE IPOMOEA SPECIES COLLECTED FROM IN AND AROUND BANGALORE

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ABSTRACT

The preliminary phytochemical analysis of plants will help in the identification of bioactive components present in each species, the knowledge of which, could help in comparing the differences between species and also in drug discovery.. A comparative study of secondary metabolites was done on *Ipomoea obscura, Ipomoea quamoclit, Ipomoea palmata, Ipomoea indica and Ipomoea beraviensis* using the leaf and flower extracts. Qualitative analysis was done for various constituents like Alkaloids, Flavonoids, Tannins, Saponins, Lignin's, Terpenoids, Glycosides, Anthraquinone and Phlobatannins. The phytochemical screening revealed the presence of alkaloids and flavonoids invariably in all the extracts.

KEY WORDS: **Ipomoea species, Secondary metabolites, Active components, Alkaloids and Flavonoids**

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INTRODUCTION

The genus Ipomoea has approximately 500-600 species found throughout tropical and subtropical regions of the world and it comprises the largest number of species within convolvulaceae.[1] Several species of Ipomoea have been used as ornamental plants, food, medicines and in religious rituals. The topography of India which is in the tropical belt with its varied climatic zones makes it a vast store house of medicinal plants. There is a continuous and urgent need to discover new compounds with diverse chemical structures and novel mechanisms of action.[2] Phytochemical investigations of crude plant extracts shows the presence of active principles in the plant parts like bark, leaves, flowers, roots, fruits, seeds etc. phytochemicals are non nutritive plant chemicals that have protective or disease preventive properties.[3] Plants synthesize certain chemicals which may be useful in controlling certain diseases. The present work deals with the phytochemical screening of five species of Ipomoea viz *Ipomoea obscura, Ipomoea quamoclit, Ipomoea palmata, Ipomoea indica & Ipomoea beraviensis.*The preliminary phytochemical analysis of these plants may help in the synthesis of complex chemical structures.

MATERIALS AND METHODS

Preparation of Extracts

Fresh plant parts (leaves and flowers) were collected from in and around Bangalore. The materials were washed with tap water and then rinsed with distilled water. The extracts of the leaf sample were prepared by soaking 25g of fresh leaves (cut into small pieces) in 200 mL of 80% methanol and the flower extracts were prepared by soaking 10g of the flower in 100ml of 80% methanol for 72 hours at 4^{o} c. The extracts were centrifuged and then filtered. The filtrates were stored in airtight bottles for phytochemical analysis.[4]

Phytochemical Screening

The phytochemical tests were carried out on the extracts using standard procedures to identify the constituents as described by Harborne (1973).[5]

Test for Alkaloids – Wagner's Test – Few drops of wagner's reagent was added into 2 mL of the extract.
Test for Flavonoids – Lead Acetate Test – Extracts were treated with few drops of 25% lead acetate solution.
Test for Glycoside – One mL of water was added into a small amount of extract and shaken well. Then an aqueous solution of sodium hydroxide was added.
Test for Phenolics – Ellagic Test – The extract was treated with few drops of 5% glacial acetic acid and 5% $NaN0_2$solution.
Test for Lignin – Two mL of 2% furfuraldehyde was added into the test solution.
Test for Saponin – To the extract add sodium bicarbonate and shake well, honey comb froth formation.
Test for Tannin – One percent gelatin solution was added into the extract.
Test for Terpenoids – The extract is treated with 1 mL of 1% 2,4 di-nitro phenyl hydrazine in 2M HCl.
Test for Anthraquinone – Half an mL of the extract was taken into a dry test tube and 5 mL of chloroform was added and shaken for 5 minutes. The extract was filtered and the filtrate was shaken with equal volume of 10% ammonia solution.
Test for Phlobatannins – One mL of extract was dissolved in distilled water and filtered. The filtrate was boiled with 2% HCl solution

Table 1
Qualitative analysis of various phytochemicals present in the leaf and flower extracts of five Ipomoea species.

Sl no.	TESTS	*Ipomoea obscura*		*Ipomoea quamoclit*		*Ipomoea palmata*		*Ipomoea indica*		*Ipomoea beraviensis*	
		LE	FE	LE	FE	LE	FE	LE	FE	LE	FE
1	Test for Alkaloids Wagner's Test	+	+	+	+	+	+	+	+	+	+
2	Test for flavonoids Lead Acetate Test	+	+	+	+	+	+	+	+	+	+
3	Test for Glycoside	+	_	+	_	+	+	+	+	+	+
4	Test for phenols	+	_	_	_	+	+	+	_	+	_
5	Test for Saponin	+	_	_	_	+	+	_	_	_	_
6	Test for Tannins	_	_	_	_	+	+	+	+	+	_
7	Test for Anthraquinone	_	_	_	_	+	_	+	_	+	_
8	Test for Phlobatannins	_	_	_	+	+	+	_	+	_	+
9	Test for Lignin	_	_	_	+	_	+	_	_	_	_
10	Test for terpenoids	+	+	+	_	_	_	+	+	+	_

Present +, Absent – LE – Leaf extract, FE – Flower extract

RESULTS

The result for the qualitative tests that were carried out with the leaf and flower extract is given in Table – 1.Few drops of wagner's reagent added to the extract shows a reddish brown precipitate indicating the presence of alkaloids. Lead Acetate test was carried out to detect the presence of flavonoids. Extracts were treated with few drops of 25% lead acetate solution, formation of yellow colour precipitate indicates the presence of flavonoids. Ellagic test was carried out to detect the presence of phenols. The extract was treated with few drops of 5% glacial acetic acid and 5% $NaN0_2$ solution the solution turns muddy or a brown precipitate is seen indicating the presence of phenols. 1 mL of water was added into a small amount of extract and

shaken well, then an aqueous solution of sodium hydroxide was added the appearance of yellow colour indicates the presence of glycosides.

DISCUSSION

It is observed that every sample invariably shows the presence of Alkaloids and Flavonoids. Alkaloids have many physiological effects that make them valuable as medicines. Alkaloid which is present in all the 5 species is found to be comparatively lesser in *Ipomoea quamoclit* Flavonoid is one plant metabolite which is found in high quantity in all the five species of Ipomoea under study. Flavonoids have a wide range of biological and pharmacological activities according to in vitro studies, which includes biological activities like anti-inflammatory, antioxidant[6] and anti-allergic[7] properties. Phenols is present in the leaf extract of *Ipomoea obscura, Ipomoea indica* & *Ipomoea beraviensis* but absent in the flower extract of the same. It is present in both the leaf and flower extract of *Ipomoea palmata* and absent in both flower and leaf extract of *Ipomoea quamoclit*. Glycoside was found to be present in all the extracts except in the flower extracts of *Ipomoea obscura* and *Ipomoea quamoclit.* Glycosides play numerous important roles in living organisms. Most chemicals in plants are bound to glycoside and many of these shows pharmaceutical value.[4] Another secondary metabolite observed was tannin, tannins are astringent in nature and hence act as a defence mechanism in plants protecting them from pathogens.

CONCLUSION

The phytochemical screening of the extracts is beneficial to identify the bioactive compounds and necessary for further study.

CONFLICT OF INTEREST

Conflict of interest declared none.

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