



PRELIMINARY PHYTOCHEMISTRY AND PHENOLIC COMPOUNDS OF SOME FOLK MEDICINAL PLANTS

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ABSTRACT

Several species of plants are being used as folk medicine by various tribal and local communities in India as well as all over the world since ancient days. Five medicinal plant species were analysed for their basic chemical composition that makes them medicinal. All the selected plants are found to contain phytochemicals like alkaloids, phenolics, flavonoids, tannins and saponin. It was observed that phenolic compounds are the most active drug content in modern herbal medicine. Therefore, this study is focused on phenolic content in the plants under study.

Key words: Folk medicine, preliminary phytochemistry, phenolic compounds, active drug.

INTRODUCTION

Medicinal plant species are so regarded because they are sources of well known and medically useful secondary products which are being used as pain killers like morphine, stimulants like nicotine, caffeine, cocaine and depressants with high potency in the management of ailments in humans. Generally, plants drugs are unique in containing compounds that are end-products of long biosynthetic pathways and are usually not needed in such plants' metabolic processes. The secondary metabolites are alkaloids, phenolics, flavonoids, essential oils and other organic constituents¹.

These secondary metabolites are usually produced in different parts of the plants like the root, leaves, fruits, and seeds and then translocated to other parts of plant for storage. Knowledge about these medicinally active constituents makes their application as medicine as mentioned in the various pharmacopoeias. Recently, in the field of ethnomedicine it has been discovered that therapeutic efficacy was more pronounced when the active compound was left in a particular combination with other principles naturally present in plant in comparison of isolated and synthesized principle in the laboratory.

The focus of the present study is to analyse the basic preliminary chemical composition and quantitative analysis of phenolic compounds in the leaves of plants under investigation i. e. *Phyllanthis amarus* Schum & Thorn, *Ageratum conyzoides* L., *Carica papaya* L., *Tephrosia hamiltonia* L., *Cymbopogon citratus* L. and The plants under study with their respective families and medicinal uses are presented in Table 1.

MATERIALS AND METHODS

The leaves used for this study were obtained from different plant species growing in their natural habitats. For the study five plants were selected (*Phyllanthis amarus* Schum & Thorn, *Ageratum conyzoides* L., *Carica papaya* L., *Tephrosia hamiltonia* L., *Cymbopogon citratus* L.). Their medicinal importance was confirmed

using the text references². The preliminary chemical composition was analyzed using some standard chemical tests^{3,4} and further the phenolic composition was decided by following routine TLC method followed by quantification as described by Gordon⁵. To each sample solution (1.0 ml) and standard (Gallic acid) was added 5 ml of Folin-ciocalteu and 4 ml sodium carbonate (7 % w/v). The mixture were shaken and allowed to stand for 30 min in the dark at room temperature; after which absorbance was measured at 765 nm using a spectrophotometer. The amount of total phenolics was expressed as Gallic acid equivalent (GAE) in milligram per gram dry plant powder.

RESULT AND DISCUSSION

The analysis of primary chemical composition was done to observe presence of different phytochemicals like alkaloids, flavonoids, tannins, phenols and saponins. It was found that alkaloids, flavonoids and phenolic compounds were present in all five plants while saponin was absent in *A. conyzoides*, *C. papaya* and *C. citratus* and tannin was not observed in *A. conyzoides*, *C. citratus* and *T. hamiltonia*. The data of preliminary phytochemistry is presented in Table 2.

Similar reports were made by several workers indicating the preliminary phytochemical investigation of wild medicinal plants and their quantification for searching bioactivity of specific chemical compounds which give the medicinal property to a plant⁶⁻⁸.

The quantification of phenolic compounds as presented in Table 3 indicates that, these plants are rich in phenolic compounds. *P. amarus* possesses highest phenolic content (3.60 mg/g) while *A. conyzoides* contain least (1.86 mg/g) phenolics in their leaves. Table 2 showed the content of phenolic compounds of each plant species. However, further separation and isolation of phenolic compounds is necessary to ascertain the specific action of the compounds.

Table 1: List of plant species under study

SN	Plant Species	Family	Medicinal uses
1	<i>Phyllanthus amarus</i> Schum & Thorn	Euphorbiaceae	Used against hypertension and kidney stone
2	<i>Ageratum conyzoides</i> L	Asteraceae	Cure wounds and burns, anti-dysenteric, antilithic
3	<i>Carica papaya</i> L	Caricaceae	Use to remove intestinal worms
4	<i>Tephrosia hamiltonia</i> L	Fabaceae	Blood purifier, anthelmintic, anti-tumour
5	<i>Cymbopogon citratus</i> L	Poaceae	Insect repellent, disinfectant, anthelmintic

Table 2: Preliminary chemical composition of leaves of plants species under study

SN	Plant sp.	Alkaloids	Flavonoids	Tannin	Phenolics	Saponin
1	<i>A. conyzoides</i>	+	+	--	+	-
2	<i>C. papaya</i>	+	+	+	+	-
3	<i>C. citratus</i>	+	+	-	+	-
4	<i>P. amarus</i>	+	+	+	+	+
5	<i>T. hemiltonia</i>	+	+	-	+	+

Table 3: Quantification analysis of phenolic compounds in leaves of plants under study

SN	Plant species selected	Amount of phenolic compounds in leaves
1	<i>A. conyzoides</i>	1.86 mg/g
2	<i>C. papaya</i>	2.65 mg/g
3	<i>C. citratus</i>	2.80 mg/g
4	<i>P. amarus</i>	3.60 mg/g
5	<i>T. hemiltonia</i>	2.35 mg/ g

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