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PHYTOCHEMICAL SCREENING OF EIGHT TRADITIONALLY USED ETHNOMEDICINAL PLANTS FROM AKOLA DISTRICT (MS) INDIA

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ABSTRACT

The preliminary phytochemical analysis of eight ethnomedicinal plants from Akola District (MS) was done. The plants were *Ocimum sanctum* L., *Hyptis suaveolens* (L) Poit., *Croton tiglium* L., *Physalis minima* L., *Tephrosia villosa* (L) Pers., *Malachra capitata* L., *Cleome viscosa* L., and *Galphimia glauca* Cav. Qualitative phytochemical analysis of these plants confirms the presence of various phytochemicals like alkaloids, flavonoids, tannins, phlobatannin, terpenoid, saponin, steroid and cardiac glycosides in their aqueous leaf extracts. Some of these phytochemicals were further estimated quantitatively. Present paper deals with the significance of these phytochemicals with respect to the role of these plants in traditional medicinal system.

KEY WORDS

Ethnomedicinal plants, Phytochemical analysis, Traditional medicinal system.

INTRODUCTION

World plant biodiversity is the largest source of herbal medicine and still about 60 – 80 % world population rely on plant based medicines which are being used since the ancient ages as traditional health care system. It is now clear that, the medicinal value of these plants lies in the bioactive phytochemical constituents that produce definite physiological effects on human body. These natural compounds formed the base of modern drugs as we use today^{1, 2, 3}.

Phytoconstituents are the natural bioactive compounds found in plants. These phytoconstituents work with nutrients and fibers to form an integrated part of defense system against various diseases and stress conditions.

Phytochemicals are basically divided into two groups, i.e. primary and secondary constituents; according to their functions in plant metabolism. Primary constituents comprise common sugars, amino acid, proteins and chlorophyll while secondary constituents consists of alkaloids, terpenoids, saponins, phenolic compounds, flavonoids, tannins and so on. The present study revealed the qualitative and quantitative phytochemistry of eight medicinal plants used by the peoples of Akola district (MS) India, to cure various ailments.

MATERIAL AND METHODS

1. Material collection and sample processing:

The plant material was collected from the local area and identified taxonomically in the Department of Botany, Shri Shivaji College, Akola (MS). The voucher specimens were deposited in the Departmental herbarium.

The leaves of the plants are properly washed in tap water and then rinsed in distilled water. The rinsed leaves are dried in an oven at 35°C for 4 days. The dried leaves of each plant were crushed to obtain powder. These powdered samples are then stored in airtight polythene bags protected from sunlight until use. The aqueous extract of each sample was prepared by soaking 10g of powdered sample in 200ml distilled water for 12h. The extracts are then filtered using Whatmann filter paper.

2. Qualitative and Quantitative Analysis of Phytoconstituents:

Preliminary phytochemical tests of aqueous extracts/ powdered sample of each plant was carried out as described by Harborne (1973)⁴, Edeoga et al., (2005)¹ and Krishnaiah et al (2009)⁵. The crude phenols and tannins were estimated spectrophotometrically (Krishnaiah et al., 2009)⁵ while alkaloids, saponins and flavonoids were quantified following the method of Harborne (1973)⁴.

RESULTS AND DISCUSSION

The present investigation was carried out on eight plants to study the presence of medicinally active phytochemicals in the leaves of eight ethnomedicinal plants from Akola District (MS) India (Table-1). The results are summarized in table 2 and 3. Alkaloids, flavonoids, tannins

and saponins are present in all plants investigated, while phlobatannins are present only in *O. sanctum*, *C. tiglium*, *M. capitata* and *T. villosa*. Similarly glycosides give their presence in five plants i.e. *O. sanctum*, *H. suaveolens*, *C. tiglium*, *M. capitata* and *G. glauca*. Terpenoids present in seven plants studied except *P. minima*. The steroids have shown their presence only in *C. viscosa*. (Table 2).

Quantitative estimation of crude phytochemicals from these eight plants is given in table 3. *H. suaveolans* contained highest percentage of alkaloids and flavonoids (14.30± 0.36% and 12.60± 0.48%) respectively followed by *O. sanctum*. *C. villosa* showed highest tannin content 15.30± 0.11 % followed by *C. tiglium* (13.20±0.22%) and least in *H. suaveolens* (0.52 ± 0.12%). *P. minima* possesses highest amount of saponin (2.82±0.22%) while the phenols are present in the low range of (0.05± 0.02% to 0.80± 0.10%).

The above results indicates that, the leaves of the plants investigated are rich in alkaloids, flavonoids, tannins, phenols and saponins and also showed presence of glycosides. They are known to show medicinal potential and physiological activities (Sofowara. 1993). Our results are also in analogy with previous reports^{1, 6, 7, 8}. Thus the plants under investigation showed their medicinal potential and can be a source of useful drugs. However, further studies are required to isolate the active principal from the crude plant extract for proper drug development. The isolation of active principles and elemental detection of these plants are in process.

Table 1
Traditional uses of plants under investigation

Botanical Name	Family	Traditionally use to cure
<i>Ocimum sanctum</i>	Lamiaceae	Skin diseases, respiratory and gastrointestinal disorders, also in cough, cold and fever
<i>Hyptis suaveolens</i>	Lamiaceae	Skin diseases and bronchial disorders
<i>Croton tiglium</i>	Euphorbiaceae	Pain reliever and Dry cough
<i>Physalis minima</i>	Euphorbiaceae	To cure Jaundice
<i>Malachra capitata</i>	Malvaceae	Gastric disorders & Jaundice
<i>Cleome viscosa</i>	Capparadaceae	Earache, expelling roundworms
<i>Galphimia glauca</i>	Malpighiaceae	Mental disorders
<i>Tephrosia villosa</i>	Fabaceae	Liver, heart and post natal disorders

Table 2
Preliminary Phytochemistry of eight selected ethnomedicinal plants

Plant extracts	Alkaloids	Flavonoids	Steroid	Tannin	Phlobatanin	Terpenoid	Saponin	Glycosides
<i>O. sanctum</i>	+	+	-	+	+	+	+	+
<i>H. suaveolens</i>	+	+	-	+	-	+	+	+
<i>C. tiglium</i>	+	+	ND	+	+	+	+	+
<i>M. capitata</i>	+	+	-	+	+	+	+	+
<i>T. villosa</i>	+	+	-	+	+	+	+	ND
<i>P. minima</i>	+	+	-	+	-	-	+	ND
<i>C. viscosa</i>	+	+	+	+	-	+	+	ND
<i>G. glauca</i>	+	+	ND	+	-	+	+	+

Table 3
Quantitative phytochemical estimation of selected ethnomedicinal plants

Plants	Alkaloid	Flavanoid	Tanins	Phenols	Saponins
<i>O. sanctum</i>	11.80 ± 0.22	11.50 ± 0.18	0.72± 0.06	0.05± 0.02	0.58± 0.11
<i>H. suaveolens</i>	14.30± 0.36	12.60± 0.48	0.52 ± 0.12	0.05± 0.03	0.30± 0.02
<i>C. tiglium</i>	1.50± 0.24	0.80± 0.10	13.20±0.22	0.10± 0.06	ND
<i>M. capitata</i>	1.40± 0.11	0.18± 0.10	9.60± 0.20	0.80 ± 0.10	ND
<i>P. minima</i>	0.78± 0.32	0.55± 0.11	12.50± 0.30	0.80± 0.10	2.82± 0.22
<i>C. viscosa</i>	0.40±0.12	0.30± 0.15	15.30± 0.11	0.20±0.10	2.0± 0.10
<i>T. villosa</i>	0.65±0.11	0.34± 0.15	10.22± 0.14	0.24± 0.22	1.80± 0.31
<i>G. glauca</i>	0.85± 0.31	1.26± 0.08	12.15± 0.30	0.15± 0.11	0.80± 0.24

The results are the mean of triplicate estimation ± standard error

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