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PRELIMINARY PHYTOCHEMICAL SCREENING AND PHYSICO-CHEMICAL PARAMETERS OF AERIAL PARTS OF *ARTEMISIA VULGARIS*

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ABSTRACT

Artemisia vulgaris is an annual herb plant is a very common medicinal plant used for the various ailments. The aerial parts of *Artemisia vulgaris* is mainly found in north India (Uttarakhand) and then dried, extracted and calculate the percentage of yield. Phytochemical studies of the Hexane and methanolic extracts showed the presence of carbohydrate, saponins, phytosterol, proteins and amino acid, tannin & phenolic compounds and flavonoids. It was concluded that the all extract contains more important chemical constituents for various pharmacological activities. The present paper deals with the standardization of its aerial parts of plant on the basis of various Pharmacognostic parameters. The determination of these characters will aid future investigators in their Pharmacological analyses of this species.

KEYWORDS: Tannin, Total Phenol, Phytochemical screening, *Artemisia vulgaris*.

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INTRODUCTION

Artemisia vulgaris, family Compositae or Asteraceae commonly called Mugwort pollen (Hindi). Mugwort pollen is one of main sources of hay fever and allergic asthma, in North Europe, North America and in parts of Asia[3]. The fern like leaves of many species are covered with white hairs. The stem is thin woody and the plant produced in an annual aromatic north and south Indian plants. Mugwort pollen is an aggressive and invasive plant. Most of the species are found growng wild and abundantly all over the temperate and cold temperate zones of the world. It is slightly toxic and many Pharmacological activities of Artemisia *vulgaris* have been reported: Prolonged dosage can damage the nervous system[9]. All parts of the plant are anthelmintic, antiseptic, antispasmodic, carminative, cholagogue, diaphoretic, digestive, emmenagogue, expectorant, nervine, purgative, stimulant, slightly tonic and used in the treatment of women's complaints.[5,8,11] The leaves are harvested in August and can be dried for later use. The leaves are also said to be appetizer, diuretic, haemostatic and stomachic[6]. An infusion of the leaves and flowering tops is used in the treatment of nervous and spasmodic affections, sterility, functional bleeding of the uterus, dysmenorrhoea, asthma and diseases of the brain[1]. The leaves have an antibacterial action, inhibiting the growth of Staphylococcus aureus, Bacillus typhi, B. dysenteriae, streptococci, E. coli, B. subtilis, Pseudomonas. The stem is also said to be antirheumatic, antispasmodic, and stomachic[6]. The roots are tonic and antispasmodic[1]. Ethnoveterinary medicines used to treat endoparasites and stomach problems in pigs and pets in British Columbia, Canada[4].

MATERIALS AND METHODS

Plant Materials

The plant (*Artemisia vulgaris*) used for this study was collected from North India (Dehradun) and identified at Department of Pharmacy, Kumaun University Nainital. A voucher specimen has also been deposited in the herbarium of the institute for future references. Pharmacognostical parameters as per Ayurvedic Pharmacopoeia of India[12] and also primary and secondary plant metabolite. All the reagents used were of the analytical and highest purity grade from standard companies.

Extraction

The air dried aerial parts of the plant were cleaned and reduced to powdery form with the help of mechanical grinder after which 250 gm of powdered sample was exhaustively extracted with 2.5 lt of methanol (analytical grade), for 3 days (by sox-let apparatus). The plant material was separated by filtration and the Hexane and methanolic extracts were concentrated (by Rotavapour, Büchi, Switzerland) and lyophilized to preserve it. The residue was obtained 2.1 and 4.2gm and the extract was stored in a refrigerator at 4^0C. Extract were completely air dried and calculate the percentage of yield.

Phytochemical screening

The various extract of the aerial parts of *Artemisia vulgaris* and subjected to preliminary phytochemical screening was carried out on their extract using the standard screening method[10]. The molish's test and fehling's test were carried out for carbohydrate. Foam test for saponins. Salkowiski test & Libermann burchard test for phytosterol. Aq. Sodium hydroxide test, conc^n sulphuric acid test and shinoda's test were carried out for flavonoids. Biuret test, Ninhydrin test and Million's test were carried for proteins & amino acid.

RESULT AND DISCUSSION

Physico-chemical parameters

Various physicochemical parameters such as moisture content and foreign organic matter were determined as Table 01. The total ash of the plant sample, acid insoluble ash and water-soluble ash values were determined as (**Table- 01**).

Extractive values of crude drugs are useful for their evaluation, especially when the constituents of a drug cannot be readily estimated by any other method. Further, these values indicate the nature of the constituents present in a crude drug. The percentage of alcohol soluble extractive value and water-soluble extractive value were determined as (**Table 01**). Estimation of primary and secondary plant metabolite such as tannin, starch, sugar and total phenol values were determined as (**Table- 01).**

Extraction

The various extracts obtained were air dried, weighed and calculated the percentage of yields in the table 02, percentage yield of methanolic extract was found to be higher than hexane extract of aerial parts of *Artemisia vulgaris*. It shows methanolic extract contain much more chemical constituents other than hexane extract.

Phytochemical screening

The results of the phytochemical screening were carried out on the two extracts and recorded as shown in table no. 03. Preliminary phytochemical revealed the presence of saponins, phytosterols, carbohydrates, proteins & amino acid, and flavonoids in methanolic extract of aerial parts of *Artemisia vulgaris*. Phytoconstituents in the various part of the plant vary significantly.

The plant contains ascorbic acid and phenolics both which are powerful antioxidants. The presence of saponins protects plant from microbial pathogens[13]. Flavonoidal extracts of aerial parts of *Artemisia vulgaris* may be shown anti-inflammatory activity.

Flavonoids act as an anti-inflammatory response in the same way as the non-steroidal anti-inflammatory drugs, i.e. by inhibiting the enzymes that cause the synthesis of prostaglandins[2]. Further studies may reveal the extract mechanisms of action responsible for the analgesic and anti-inflammatory activities of *Artemisia vulgaris*.

Results reveals that the all extract has large number of phytoconstituents, which may be responsible for many pharmacological activities; further work is required to investigate the all extracts of aerial parts of *Artemisia vulgaris* for various pharmacological activities.

CONCLUSION

Preliminary phytochemical screening of the methanolic extract shows the presence of flavonoids and saponins. These bioactive agents (flavonoids and saponins) have the ability to inhibit pain perception and they can also serve as anti-inflammatory agents[2,7]. Flavonoids act as an anti-inflammatory response in the same way as the non – steroidal anti-inflammatory drugs, i.e. by inhibiting the enzymes that cause the synthesis of prostaglandins[2]. Further studies may reveal the mechanisms of action responsible for the analgesic and anti-inflammatory activities of *Artemisia vulgaris*.

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Table 01: Quantitative Physico-Chemical Analysis of *Artemisia vulgaris*.

S.No.	Paramaters	Range(%)	Mean(%)	S.D.
1	Moisture content (w/w)	12.54-16.15	13.87	±1.9836
2	Foreign matters (w/w)	0.3-0.6	0.46	± 0.1527
3	Total ash (w/w)	15.42-16.15	15.80	±0.3669
4	Acid insoluble ash (w/w)	0.32-0.38	0.35	±0.0305
5	Water soluble ash (w/w)	0.24-0.27	0.25	±0.0152
6	Alcohol soluble extractive (w/w)	5.21-6.42	5.81	±0.6050
7	Water soluble extractive (w/w)	7.21-9.32	8.36	±1.0686
8	Tannin	0.21-0.22	0.21	±0.0025
9	Sugar	7.52-9.86	8.66	±1.1709
10	Starch	12.62-13.12	12.85	±0.2510
11	Total Phenolic	2.18-2.21	2.16	±0.0508

Table 02: Percentage yield of hexane and methanolic extracts from *Artemisia vulgaris*

S.No.	Part of Plant	Percentage of yield of extracts	
1.	Aerial parts	Hexane 4.31	Methanol 16.35

Table 03: Phytochemical screening of different fractions

S. No.	Constituents	Tests	Hexane	Methanolic
1.	Carbohydrate	Molish's test	_	+
		Fehling's test	_	_
2.	Glycoside	Legal's test	_	_
		Keller killanis test	_	+
3.	Fixed oil & fats	Spot test	+	−
		Saponification test	+	−
4.	Proteins & amino acids	Million's test	_	+
		Ninhydrin test	_	+
		Biuret test	_	_
5.	Saponins	Foam test	_	+
6.	Phenolic compunds & tannins	$FeCl_3$ test	_	+
		Lead acetate test	_	+
7.	Phytosterol	Salkowiski test	_	+
		Libermann burchard test	_	+
8.	Alkaloids	Dragendroff's test	_	_
		Mayer's test	_	_
		Hager's test	_	−
10.	Resin	Resin	_	_
11.	Flavonoids	Aq. NaOH test	+	+
		Conc. H_2SO_4 test	_	+
		Shinoda's test	_	_

Where:- (+) = Presence, (−) = Absence

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