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RESEARCH ARTICLE

PHYSICOCHEMICAL AND PHARMACOGNOSTICAL EVALUATION OF ETHANOLIC EXTRACT OF VASAKA LEAF

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ABSTRACT

Background: *Adhatoda vasica* Nees *(Family - Acanthaceae)*, commonly known as Vasaka, Adosa Arusha is found indigenously in India. Vasica is most well-known for its effectiveness in treating respiratory conditions. Yogischews fresh leaves of the plant with ginger because of their stimulant effect on the respiratory system. Vasica is an antispasmodic and expectorant, and has been used for centuries with much success to treat asthma, chronic bronchitis, and other respiratory conditions.
Material and Method: The plant is rich source of polyphenolic compounds, flavonoids which are reported to be responsible for strong anti-oxidant properties. Several researchers has reported several constituents by using different methods. Here 20 gram fresh dried leaves were extracted in ethanol for two days at 50°c.further study include physicochemical and phytochemical evaluation.
Result: From the preliminary study steroid, saponin alkaloids and steroids were confirmed.
Conclusion: study may be valuable as a useful measure in standardization of the plant material, for isolation of valuable phytoconstituents, pharmacological investigations and to ensure its value.

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INTRODUCTION

The vasaka plant perennial, evergreen and highly branched with unpleasant smell and bitter taste. It is a shrub 1.0 m to 2.5 m in height, with opposite ascending branches. It grows all over the India and in the lower Himalayan ranges. In Ayurvedic medicine, *Adhatoda vasica* has been used for a variety of disorders including analgesic, diarrhoea, dysentery, anthelmintic, jaundice, anti-ulcer, antihistaminic effect, cardiac depressant, thrombopoeitic activity, moderate hypotensive activity, sedative, antispasmodic, anti-inflammatory, antioxidant, hepatoprotective, antidiabetic activity, infertility, abortifacient and uterotonic, antibacterial antimicrobial activity, wound healing effect (Vinothapooshan, 2010; Vinothapooshan, 2011). The plant has been reportred to contains alkaloids, tannins, flavonoids, terpenes, sugars, and glucosides.Vasicine and vasicosine has been reported to be present in the alkaloidal fraction of the plant extract. The leaves of the plants are found to be rich in vitiamine C, carotrene and essential oils.whereas vasicinolone, vasicol, peganine, deoxyvasicine, sitosterol are reported tyo be present in roots of the plant (Kavitha, 2012; Bhatt, 2011; Ganguli, 2010). The flowers contain b-sitosterol-D-glucoside, kaempferol, quercetin Minor Adhatonine, Vasinol (The Ayurvedic Phamacopoeia of India, 1990).

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MATERIALS AND METHODS

Plant Collection and Identification

The leaves of Adhatoda vasica were collected from Gharsi village hills (Ethnobotanical survey of medicinal plants from Gharsi village hills and its allied area of district Solan, 2013) of Solan district of Himachal Pradesh India. The collected leaves were then dried in shade and crushed to form coarse powder.

Pharmacognostical Studies

Macroscopic study

Morphological studies of leaves such as color, size, odor, taste, surface characteristic and fracture were examined using

the terms and outlined given in Ayurvedic Pharmacopoeia (The Ayurvedic Phamacopoeia of India, 1990) (Table 2)

Phytochemical Screening

The drug was powdered and its ethanolic extract was prepared. Various tests were performed as per mentioned in the textbook of Practical Pharmacognosy, for detection of different phytoconstituents (Khandelwal, 2010; Kokate, 2007) (Table 1).

Physico-Chemical Study

The percentage of water soluble extractive values, loss on drying, and total ash were determined according to the method described in WHO guidelines on quality control methods for medicinal plants materials (Khandelwal, 2010; Kokate, 2007).

Volatile oil Extraction: Hydro distillation (10) was performed to obtain the volatile oil from the powdered vasaka leaves.

UV Analysis: Two gram of ethanolic and water extract were dissolved in 100 ml of respective solvents and designated as stock solutions. The ethanolic and water extracts were studied at different wavelengths like 265,270,275,280,285 and 290 (Fig.2).The linear curves were reported for different dilutions (fig 3,4). Dilutions were prepared from stock solutions like 0.1,1,3,5 and 10 µl.

Thin layer chromatography: TLC was performed for the extract of vasaka after desolving it in distilled water (11). Total six TLC plates were prepared and R_f vales were calculated for each. Spot (Table 3)

RESULTS

Macroscopic study: The leaves are lanceolate in shape with crenate margin and accumunate apex. Leaves are 10- 28 cm in length and 4-10cm in width with 6-10 pairs of veins. The colour is observed as light green

Fig.1 Showing picture of vasaka leaf with veins

Table 1. Showing Preliminary phytochemical screening

Constituent	Result
Alkaloids	+
Carbohydrates	+
Proteins	_
Phytosterols	+
Tannins	+
Flavonoids	+

Table 2. Physicochemical Evaluation of vasaka leaf

Ash value (%)	Extractive Value	Loss on dry
18	23%	9 %

UV Analysis: in UV analysis the λ max was found to be 281. Two linear curves were reported which shows the validation of the method.

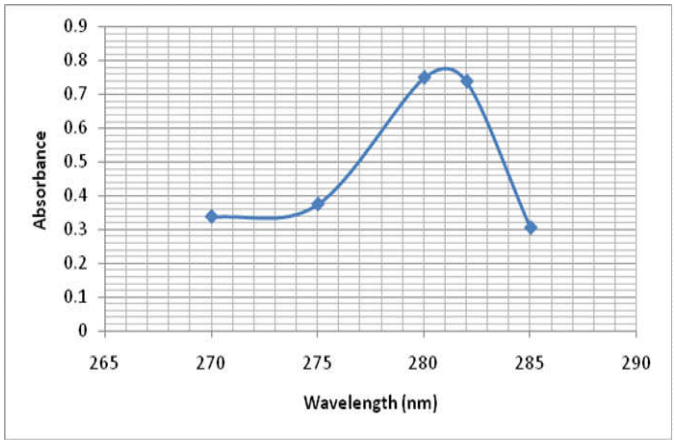

Fig. 2. λ max for vasaka leaf extract

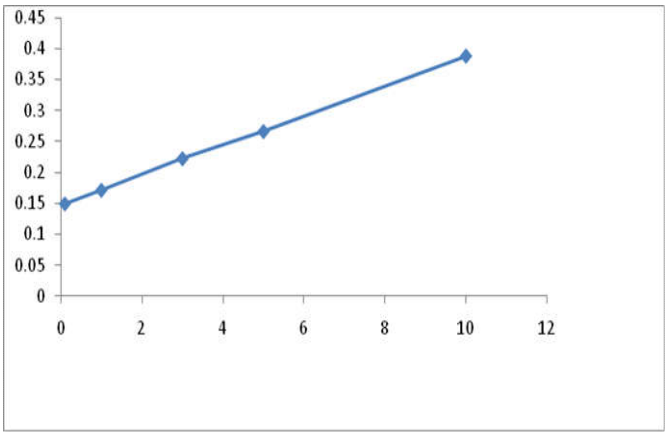

Fig. 3. Linearity curve of vasaka leaf extract in ethanol at 281 nm

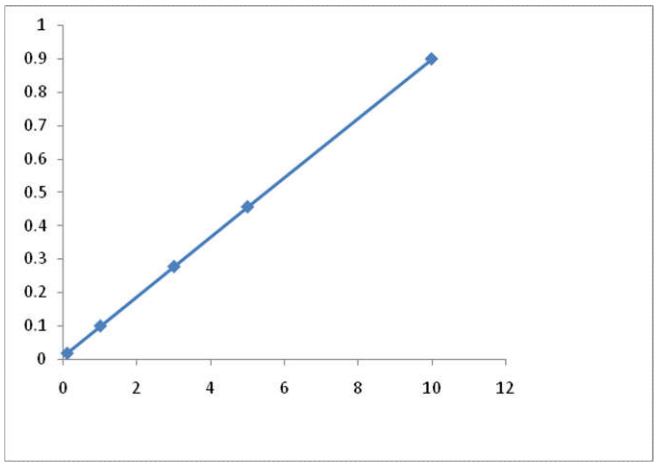

Fig. 4. Linearity curve of vasaka extract in water at 281nm

Volatile oil: After keeping clavenger apparatus continued for whole day not a trace of volatile oil was recorded from the leaves.

Table 3. Rf values from thin layer chromatography of vasaka extract

TLC plate no.	Solvent front	Solute distance							
		Spot 1.	Rf Value	Spot 2.	Rf value	Spot 3.	Rf value		
1.	7.9	7.2	0.9		6.9	0.87		6.3	0.79
2.	8.6	8.3	0.9		7.3	0.85		6.4	0.74
3.	8.8	8.3	0.94		7.9	0.89		4.9	0.55
4.	8.5	8	0.94		4.3	0.5		5.7	0.67
5.	8.5	7.9	0.92		7.9	0.92		4.3	0.5
6.	9	8.5	0.94		8.4	0.9		2.6	0.28

DISCUSSION

In macroscopic pharmacognostical studythe leaf are observed to be light green with bitter taste and characteristic odour. Here, the shape of the leaf was observed to be lanceolate. This observation is confirmed after matching with Ayurvedic pharmacopoeia of India and Indian herbal pharmacopoeia. The leaf has been reported to possess ovate lanceolate shape by few researchers (Thakur Shilpa, 2014).The margin of the leaf is found to be crenate. The same observation has been reported (Thakur Shilpa, 2014). The apex of the leaf was found to be accumunate and similar result has been reported in Indian herbal and Ayurvedic Pharmacopoea. The length of the leaf has mentioned to be 10-20 in Indian Herbal Pharmacopoea and 10-30 cm in Ayurvedic Pharmacopoea of India. In the present study the length was reported as 10-28 cm.

This variation may be because of change in environment. The length was reported as 4-10. Total 6-10 pairs of veins were observed in leaf. In phytochemical screening Alkaloids, carbohydrates, phytosterols, Tannins, Flavonoids and saponins were found to be present in methanlic extract. Carbohydrates, Alkaloids (Thakur Shilpa, 2014; Arabind Kumar; Atul Kumar Gangwar), phytosterols, Flavonoids, Tannis and Flavanols has been reported in methanolic extract of vasaka leaf (Thakur Shilpa, 2014). In a similar experiment cardiac glycosides, vitamine C, Alkaloids, Saponins are found to be present in Methanolic extract (Arabind Kumar).

Physicochemical evaluation: Here, Total ash value (18%), Water soluble extractive value (23%) and loss on drying (9%) has been studied. If the result is compared with previously reported results than total as 12% and loss on drying has been reported as 9.8% (13). Again loss on drying 7%, water soluble extractive value 28.5 and total ash was reported as 14% (Thakur Shilpa, 2014).

UV Analysis: From the UV study here we reoprted the λ- max 281 nm however the TLC dentiometric study of vasicine has been reported at 254 nm several time (Vandanav, 2011). Here total six wavelength were studied from 265,270,275,280,285 and 290. The graph showed maximum peak at 281 nm. The linearity curves for both extracts ethanolic and distilled water were studied by taking different dilutions at 281 nm.

Volatile oil extraction: The assambly of clavenger apparatus for volatile oil extraction was tried to get any positive report for volatile oil but no amount of volatile oil was obtained.

TLC: Total 6 plates were eluted by using TLC method by selecting solvent system Chloroform: methanol (49:1). From the result Rf values 0.9-0.94 seven time, 0.85 to 0.89 three time, 0.74 to 0.79 two time,0.67 one time and 0.5 to 0.55 three time whereas 0.28 one were reported.

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