



Research Paper

Phytochemical study on *Andrographis echinoides*

Jyoti Pandey¹, Vimal K. Saini² and Shashi Tiwari³ and Wasim Raja⁴

¹Shri Guru Nanak Mahila Mahavidyalya, Jabalpur, Madhya Pradesh, India

²Government M.H. College of H.Sc. and Sc. for Women Autonomous, Jabalpur, MP, India

³Central Laboratory Facility, Chhattisgarh Council of Science and Technology, Raipur, Chhattisgarh, India

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Abstract: This study conducted to evaluate the phytochemical study of *Andrographis echinoides*. The plant belongs to genus *Andrographis*, family *acanthaceae*. Leaf and stem of plant of *A. echinoides* subjected to Soxhlet extraction using methanol. *Andrographis echinoides* (L) Nees is an important herb, this is commonly known as false water willow. It has antibacterial, antioxidant, antidiabetic, antipyretic, and anti-virus properties. The aim of this study is to find out phytochemicals of *Andrographis echinoides*

Keywords: *Andrographis echinoides*, phytochemical, terpenoids.

INTRODUCTION:

As we all know, India is a country of Rishi muni (sage monks). Since ancient times, they have been using trees, plants, and herbs. Some herbs are used to treat diseases, some are used to enhance the energy of the body and some are being taken as food. If we talk about Rig Veda, then the description of the plants used to cure various diseases is found in it. Susruta Samhita and Charaka Samhita is the most important literature which provides

information about uncountable herbs. Because of the huge topographical condition and climatic diversity, our country is rich with botanical wealth, there are dense forests and diversity in flora, which yields a variety of medicinal plants. According to WHO, 80% of the world population depends on traditional medicine for its primary health care (Hiremath et al, 2013). Hence in our Ayurveda system plants are being used considerably medication for many centuries. Jabalpur city is known and considered as Sanskardhani. It is situated in the East direction of the state capital Bhopal in the North of the district is Katni, Damoh in the West, Narsingpur in the south-west, Seoni in the south, Mandla in the south-east, Umaria in the north-east and Dindori in the East. It extends from 22°49' to 24°08' north latitudes and from 79°21' to 80°58' east longitude. About 13.43% of the total area comes under forest. (Census 2011). In this district has a very good climatic condition that's why the role of medicinal plants becomes very vital and significant. *Andrographis echinoides* belongs to family *Acanthaceae*, genus *Andrographis* which

consist about 40 species. In traditional Indian medicine, several *Andrographis* species have been used in the treatment of dyspepsia, influenza, malaria and respiratory infections, and as astringent and antidote for poisonous stings of some insects. (Kirtikar et al., 1886; Chopra et al., 1980). Our old literature like Ayurveda Unani and Siddha has a description of medicinal plants which can be cured of many diseases. Some studies show that in our country, ancient Vaidya people used more than 2500 plants species for their regular medicines. (Pei,2001) Some studies have shown that drinking the juice of this plant in fever immediately provides relief. (Kirtikar et al.,1975). The whole plant extract is given for the treatment of fever and applied leaf paste in case snake bite. (Alagesaboopathi 2014). Anti-inflammatory (Shen et al.,2013) Anti-oxidant (Quadria et al.,2011) antibacterial (Kanchana et al., 2014).

MATERIAL AND METHOD:

Plant material- *Andrographis echinoides* was collected from Jabalpur, (Madhya Pradesh) India.

Reagent and authentic samples – The reagents used were of highest purity (>99.95%) and were purchased from Sigma Chemical Co. (Germany).

Extract preparation: *Andrographis echinoides* leaves and stem (100g) were defatted in methanol (50%ml) with the help of Soxhlet extraction unit. The sample was collected and concentrated in water bath at 40-50°C and dried in hot air oven at 40°C. The dried powder was kept in air tied box.

Phytochemical screening of the extract:

The portion of the dry extract was subjected to the Phytochemical screening using the method adopted by Treasa, Evans, and Harborne. Phytochemical screening was performed to test for alkaloids, saponins, glycoside, proteins,

Phytosterols, flavonoids terpenoids, tannins fixed oil and fats.

Test for Alkaloids: A small portion of the extract was stirred separately with 1 ml of dilute Hydrochloric acid and filtered. The filtrate was treated with Dragandroff's reagent. Appearance of organic precipitate shows the presence of alkaloids.

Test for saponin: About 2 g of the powdered sample was boiled in 20 ml of distilled water in a water bath and filtered. 10ml of the filtrate was mixed with 5 ml of distilled water and shaken vigorously for a stable persistent froth. The frothing was mixed with 3 drops of olive oil and shaken vigorously, then observed for the formation of emulsion.

Test for Glycosides: Small quantity of the extract was hydrolysed with 5ml Hydrochloric acid for few hours on a water bath and the hydrolysate was subjected to Fehling's test. To 2ml of Fehling's solution (1ml of Fehling's A and 1 ml of Fehling's B solution), 2ml of extract was added, mixed well and boiled. Appearance of yellow or red colour precipitate indicates the presence of reducing sugars.

Test for Proteins: Small quantity of the extract was dissolved in 5 ml of water and subjected to Xanthos protein test. To 3 ml of the extract, 1ml of concentrate Nitric acid was added. A white precipitate was obtained. The solution was heated for 1minute and cooled under tap water. It was made alkaline by excess of 40% NaOH. Appearance of orange precipitate indicates the presence of protein.

Test for Phytosterol: Salkowski test was done for the detection of phytosterols. In this test, 1 ml of concentrated Sulphuric acid was added to the 1g plant extract and allowed to stand for 5 minutes. After shaking, formation of golden yellow colour in the lower layer indicates the presence of phytosterols.

Test for Flavonoids: The extract was treated with concentrated Sulphuric acid. Appearance of yellowish orange show the

presence of anthocyanins, yellow to orange colour show the presence of flavones, and orange to crimson show the presence of flavanones.

Test for terpenoids (Salkowski test): 5 g of each extract was mixed in 2 ml of chloroform, and concentrated H₂SO₄ (3ml) was carefully added to form a layer. A reddish-brown colouration of the inter face was formed to show positive results for the presence of terpenoids.

Test for tannins: About 0.5 g of the dried powdered sample was boiled in 20 ml of water in a test tube and then filtered. A few drops of 0.1% ferric chloride was added and observed for brownish green or a blue-black colouration.

RESULT:

The plant extract was screened for the presence of major secondary metabolite classes such as Alkaloids, Flavonoids Saponin, Terpenoids, Tannin, Glycosides, Phytosterol, and proteins according to common phytochemical methods. The test was based on visual observation of the change in colour or formation of precipitate after the addition of specific reagent. The results of phytochemicals tests carried out for *Andrographis echioides* with methanol solvents are present in Table 1. The present study exhibited the presence and absence of phytochemical compounds in each solvent extract.

Table 1. The present study exhibited the presence and absence of phytochemical

Serial no.	Components	<i>Andrographis echioides</i> Major Secondary metabolite Methanolic Extract	
		Leaf	stem
1	Alkaloids	+	+
2	Saponin	+	+
3	Terpenoids	+	+
4	Flavonoids	+	+
5	Protein	+	-
6	Glycoside	+	+
7	Phytosterol	+	+
8	Tannin	+	-
9	oils and fats	+	+

compounds in each solvent extract.

Presence=+

Absence = -

CONCLUSION:

After going through comprehensive study experimental results analysis, it can be concluded that *Andrographis echiooides* is a traditional remedy for fever, cold, and various infections. The plants have shown antibacterial, antiviral activity and anti-diabetic property. In our experiment, the plant extract was screened for the presence of major secondary metabolite classes such as Alkaloids, Flavonoids, Saponin, Terpenoids, Tannin, Glycosides, Phytosterol, and Protein according to common phytochemical methods. The study shows anti-oxidant, anti-inflammatory attributes of this plant, there is much more property in this plants hence the plant *Andrographis echiooides* need worthy for further investigation as used as a natural drugs development.

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