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International Journal of Current Research
Vol. 9, Issue, 08, pp.56330-56332, August, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

PHYTOCHEMICAL SCREENING OF *VITEX NEGUNDO* SPECIES (LOCAL NAME – URIKSIBI) FOUND IN IMPHAL WEST DISTRICT OF MANIPUR

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ARTICLE INFO

Article History:
Received 29th May, 2017
Received in revised form
14th June, 2017
Accepted 16th July, 2017
Published online 31st August, 2017

Key words:

Vitex negundo Linn,
Phytochemical analysis,
Methanol etc.

ABSTRACT

Vitex negundo Linn. is a large aromatic shrub distributed throughout India. *Vitex negundo* Linn. has also been extensively used in treatment of ailments as traditional medicine, folk medicine and pharmacological evidence. Traditionally the leaves of *Vitex negundo* Linn. are documented to possess antibacterial, anti-inflammatory, analgesic and antihistamine properties tonic, vermifuge. It has been reported to posses potent pharmacological properties like mosquito repellent effects as well as antiulcerogenic, antiparasitic, antimicrobial and hepatoprotective potentials, snake venom neutralization and anti-allergic activities. Phytochemical analysis revealed the presence of Proteins, Carbohydrate, Flavonoids, Phenols, Saponins and Tanins.

Citation: Ch. Helini Devi, Renuka Devi, N. and Premila Chanu, O. 2017. "Phytochemical screening of *Vitex negundo* species (local name – Uriksibi) found in Imphal west district of Manipur", *International Journal of Current Research*, 9, (08), 56330-56332.

INTRODUCTION

Medicinal plants since from prehistoric times played a most important character in world health. The use of traditional system of herbal medicine is the ancient form of healthcare and it has been used by all traditions and cultures throughout history (Barnes *et al*., 2007). Plants have been utilized as folk medicine throughout the world for centuries and indigenous communities have developed their own specific knowledge on plant resources, uses, management and conservation. Today, around 25% of all prescribed medicines in the developed world contain ingredients derived from medicinal plants (Raman N., 2006; and Wanger and Balted, 1996). *Vitex negundo* belonging to the family Verbenaceae is a large aromatic shrub or a small tree of about 3m in height (Kirtikar and Basu, 1976). It commonly bears tri- or penta-foliate leaves on quadrangular branches, which give rise to bluish-purple coloured flowers in branched tomentose cymes. It thrives in humid places or along water courses in wastelands and mixed open forests and has been reported to occur in Afghanistan, India, Pakistan, Sri Lanka, Thailand, Malaysia, eastern Africa and Madagascar. It is grown commercially as a crop in parts of Asia, Europe, North America and the West Indies (de Padua, *et al*., 1999). *Vitex negundo* L. (Verbenaceae) commonly known as nirgundi chiefly occurring throughout India (Watt, 1972; Gupta *et al*., 2005) is widely distributed in Similipal Biosphere Reserve, Orissa. *Vitex negundo* Linn (Verbenaceae) consists of 250 species of which 14 species found in India. Almost all parts of *V. negundo* are used; the leaves and the barks are the most important in the field of medicine (Chandramu *et al*., 2003). *V. negundo* leaves may have both central and peripheral analgesic action and also possesses anti inflammatory activity by acting through inhibition of prostaglandin biosynthesis (Telang *et al*., 1999). The mature fresh leaves of *V. negundo* have oral anti-inflammatory, analgesic and antihistamine properties (Dharmasiri *et al*., 2003).The decoction of leaves is considered as tonic,vermifuge and is given along with long pepper in catarrhal fever (Chandramu *et al*., 2003). Water extract of mature fresh leaves exhibited anti-inflammatory, analgesic and antihistamine properties (Dharmasiri *et al*., 2003).Leaves of this plant have been shown mosquito repellent effects (Hebbalkar *et al*., 1992) as well as antiulcerogenic (Sahni *et al*., 2001), antiparasitic (Parveen, 1991), antimicrobial (Rusia and Srivastava, 1998) and hepatoprotective (De *et al*., 1993) potentials. The methanolic root extract possessed potent snake venom (*Viper russellii* and *Naja kaouthia*) neutralizing capacity (Alam and Gomes, 2003). The acetone extract of *V. negundo* was found to possess insecticidal, ovicidal, growth inhibition and morphogenetic effects against various life stages of a noxious lepidopteran insect-pest (Prajapati *et al*., 2003). In Manipur, *V. negundo* (Local name- Uriksibi) is grown in

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plenty along the hill sides and is used since times immemorial in the treatment of various ailments. But medicinal plants unless thoroughly investigated for its composition, it is dangerous to be used widely. Traditional herbal medicine is a global phenomenon especially in the resource poor economy where only the very rich can access orthodox care. These herbal products are associated with complications such as acute renal failure and liver damage with a high incidence of mortalities and morbidities. Acute renal failure from the use of herbal remedies is said to account for about 30–35% of all cases of acute renal failure in Africa (Effiong Ekong Akpan and Udeme E. Ekrikpo, 2015). So in the present work, photochemical screening is done in *V. negundo* Linn.

MATERIALS AND METHODS

Collection of Plant material

The leaves of *Vitex negundo* were collected from Imphal West District, Manipur, India. The leaves were air dried for 20 days, crushed into coarse powder with a grinder and passed through 40-mesh sieve. They were stored in a well enclosed container.

Extraction of Plant material

The methanol extracts were prepared by soaking 100g of the dried powdered plant materials in 1L of methanol at room temperature for 48 hours. The extracts were filtered after 48 hours, first through a Whatmann filter paper No. 42 (125mm) and then through cotton wool. The extracts were concentrated using a rotary evaporator with a water bath set at 40^{o}C.

Test for Flavonoids

Alkaline reagent test: To the test solution, a few drops of sodium hydroxide solution were added. Formation of intense yellow colour which turns to colourless by addition of few drops of dilute acetic acid indicated the presence of Flavonoids.

Test for phenolic compound

Lead acetate test: To the test solution, a few drops of 10% lead acetate solution were added. Formation of white precipitate indicated the presence of phenolic compounds.

Test for tannins

Ferric chloride test: To the test solution, a few drops of ferric chloride solution were added. An intense green, purple, blue or black colour indicated the presence of tannin.

Test for steroids and terpenoids

Salkowski's test: Extract were treated with chloroform and filtered. The filtrate was treated with few drops of concentrated sulphuric acid, shaken well and allowed to stand. Appearance of red colour in the lower layer indicated the presence of steroids. Formation of reddish brown colour of interface after addition of concentrated sulphuric acid to the side (without shaking) indicated the presence of terpenoids.

Test for saponin

Froth test: Extract was added to 2-3 ml of distilled water. The mixture was shaken vigorously. Formation of foam indicated the presence of saponin.

Test for reducing sugar

Fehling's test: 0.5 g of the aqueous methanol extract in 5 ml of water was added to the boiling Fehling's solution (A and B) in a test tube. The solution was observed for a colour reaction.

RESULTS

The photochemical screening of the plants showed the presence of carbohydrates, proteins, tannins, saponins, flavonoids and phenolic compounds (Table 1). *Vitex negundo* tested negative for the presence of alkaloids, terpenoids and steroids (Table 1).

Table 1. Results of phytochemical screening present in the leaf of *Vitex negundo*

Solvent used	Part used	Phytochemicals	Test performed	result
Methanol	Stem and leaf	Alkaloids	Hager's Test	- ve
Methanol	Stem and leaf	Carbohydrates	Fehling's Test	+ ve
Methanol	Stem and leaf	Amino acids	Ninhydrin Test	+ ve
Methanol	Stem and leaf	Proteins	Biuret Test	+ ve
Methanol	Stem and leaf	Phenolic compounds	Alkaline Reagent Test	+ ve
Methanol	Stem and leaf	Tannins	Lead Acetate Test	+ ve
Methanol	Stem and leaf	Tarpenoids	Salkowski's test	- ve
Methanol	Stem and leaf	Saponins	Froth Test	+ ve
Methanol	Stem and leaf	Flavanoids	Alkaline Reagent Test	+ ve

+ve indicates the presence and –ve indicates the absence of the data

DISCUSSION

The phytochemical screening of the plants showed the presence of carbohydrates, proteins, tannins, saponins, flavonoids and phenolic compounds (Table 1). *Vitex negundo* tested negative for the presence of alkaloids, terpenoids and steroids (Table 1). Carbohydrates, along with lipids or fats and proteins provide the fuel that burns to get the necessary energy (calories) for the body to function properly. The main function of carbohydrates or carbohydrate is to provide and store energy (www.botanical-online.com/english/carbohydrates.htm. Replacing 3 percent of protein from red meat or eggs with plant proteins, regardless of other lifestyle habits, can reduce the risk of death (Stephen Feller, 2016). The presence of proteins and carbohydrates in *V. negundo* is positive for human health. The phenolic compounds are groups of plant metabolites (Singh et. al., 2007). They possess biological properties such as, antiaging, antiinflammation, and cardiovascular protection (Han *et al*., 2007). Flavonoids are wide range of phytochemical with various pharmacological effects including antioxidant, anti inflammation, anti-platelet, anti-allergic, cytotoxicity, reduce risk for heart disease or cancer etc. (Mohammad *et al*., 2013). Saponins which are known to produce inhibitory effect on inflammation (Just *et al*., 1998) Saponins have the property of precipitating and coagulating red blood cells. Some of the characteristics of saponins include formation of foams in aqueous solutions, hemolytic activity, cholesterol binding properties and bitterness (Sodipo *et al*., 2000). Tannins are polyphenolic substances found in many plants product of secondary metabolism. Its water-soluble nature allows easy extraction and is useful in various applications in the chemical and pharmaceutical industry. They are of variable chemical composition, are distinguished by the common characteristic of being astringent. Are used to interfere in alkaloids and heavy

metals absorption, due to its coagulant properties. Plants containing tannins have astringent, hemostatic, antiseptic and toning properties. The tannins have the property of coagulate proteins and mucosal tissues, by creating an insulating and protective layer that soothes irritation and pain on the skin (Tannins - Pharmacognosy - Medicinal Plants).

Conclusion

The medicinally important phytochemical constituents in Vitex negundo are bioactive in nature. The bioactive compounds are important medicinally in the treatment of different diseases.
From the above results and discussions it can be concluded that the Vitex negundo can be used for further pharmaceutical analyses for producing new drugs.

Acknowledgement

Authors are thankful to Department of Biotechnology, Government of India, New Delhi for financial assistance to conduct the present experiment.

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