



Screening of Antioxidant Property and Phytochemical Constituents of Ethereal Extract of *Vitex negundo* Linn Leaves

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Abstract : *Vitex negundo* belongs to the family Verbenaceae. Literature survey of the plant reveal that the *vitex negundo* possess antimicrobial, anti-inflammatory, analgesic, antibacterial, antifungal, anti-insects activities. In the present study the phytochemical compounds present in the ether extract of *vitex negundo linn* leaves extract analyzed and the free radical scavenging capacity of the extract. The experimental data showed that the ether extract of *vitex negundo linn* contain alkaloids, carbohydrate, glycosides, amino acids, proteins, tannins and phenolic compounds. The free radical scavenging capacity of the sample was measured by DPPH (2, 2-diphenyl-1-picrylhydrazyl) method. The IC₅₀ value of the ascorbic acid which is used as the standard is 14.97 while for sample is 46.84. the ether extract of *vitex negundo* leaves shows good antioxidant property.

Keywords : Nirgudi, phytochemical, antioxidant, Ether extract.

Introduction :

Plants having great potential to produce new drugs, through which humans can take benefit for the good healthy life [1]. Several infectious diseases can be treated with the traditional remedies [2]. The drugs which are used in the last 20 years to cure different type of diseases from which more than 25% are directly drive from plants [3]. The medicinal plants have been characterized for their bioactive compounds, which have been separated and subjected for their detailed structural analysis in the area of phytochemistry [4]. Naturally occurring drugs are easily available, less expensive, safe and having very less side effects [5].

Vitex negundo which belongs to the Verbenaceae commonly known as Nirgudi in India [6, 7]. It is having large and aromatic shrub with bluish purple flowers [8] spered in the region of Himalaya. It is genus tree and *vitex* have near about 800 species [9]. *Vitex* species are traditionally used in Indian system of medicine [10].

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Literature survey of *vitex negundo* revealed that various extracts of *vitex negundo* shows the cytotoxicity [11], antimicrobial [12-14], anti-inflammatory, analgesic [15], anti-bacterial [16, 17], anti-fungal [18-20], anti-insect [21], anti-oxidant [22, 23] mosquito repellent [24], anticancer activities [25]. Reema Murthy et al [26] also reported the presence of phytoconstituents like tannins, flavonoids, flavones and coumarins, Sahajaya et al [27] also reports the presence alkaloids, phenolic compounds, saponin of various extracts of *vitex negundo* Linn.

Many researchers have studied and report the different activities of *vitex negundo* Linn. from the different regions throughout the world. For the present study we have selected the leaves of *vitex negundo* Linn. to know it medicinal properties from the Aurangabad region.

Material and Methods:

The plant material was collected from Vasantrya Naikcollege Aurangabad. The leaves were dried in the shadow, grinded in grinder and extracted using ether as a solvent by Soxhletextracter. The solvent was evaporated and solid mass obtained was tasted for various phytochemical parameters such as alkaloids(Mayer's test, Wagner's test,Hager's test). Carbohydrates (Molish test, Fehling's test, Benedicts's test, Barfoad's test), Glycosides (Borntrager's test, Legal's test), proteins and amino acids (Millon's test, Nitric acid test,Biuret test, Ninhydrine test), Foam test, Phenolic compounds and tannin (Ferric chloride test, Gelatin test, Lead acetate test, alkaline reagent test). The procedures involved is describe in earlier reports [28].

Result and Discussion:

In the present study, ether extract of leaves of *Vitex negundo* Linn .was tested for Phytochemical constituents present in the it, and antioxidant activity also measured and IC₅₀value was calculated.

Evaluation of Phytochemical Constituents:

The medicinal properties of the plants are due to some chemical substances that produced some certain definite physiological action in the human body these non-nutritive components are called as phytochemicals [29]. The secondary metabolites found in plants are active principles of many drugs. Therefore the investigation for the basic phytochemicals of the extracts for the major phytoconstituents is also vital [30]. Traditionally used medicinal plant produced variety of 432compounds which are known for the therapeutic action [31]. Saponins one of the phytoconstituents used to stop bleeding and in treating wounds and ulcers as it helps in red blood cell coagulation [32]. Tannins are reported for their anti-bacterial and anti-herpetic activities and provides defense [33].alkaloids defense from chronic disease [34]. Steroids and triterpenoids shows the analgesic properties [35].

The present study reveal that ether extract of *Vitex negundo* Linn shows the presence alkaloids, carbohydrates, proteins, amino acid, phenolic compounds and tannins the results showed in table 1.

Table 1: Preliminary phytochemical screening of *vitex negundo* ether extract.

Sr. No.	Reagent	DEE
1.	Detection of Alkaloids	
A.	Mayer's test	-ve
B.	Wagner's test	+ve
C.	Hager's test	-ve
2.	Detection of carbohydrate	
A.	Molish test	+ve
B.	Fehling's test	+ve
C.	Benedic test	-ve
D.	Barfoad's test	+ve
3.	Detection of Glycosides	
A.	Borntrager's test	-ve
B.	Legal's test	-ve
4.	Foam test	+ve

5.	Detection of proteins and amino acid	
A.	Millon's test	-ve
B.	Nitric acid test	+ve
C.	Biuret test	-ve
D.	Ninhydrine test	-ve
6.	Detection of phenolic compound and tannins	
A.	Ferricchlorid test	+ve
B.	Gelatin test	-ve
C.	Lead acetate test	+ve
D.	Alkaline reagent test	+ve

The three test out of four are positive for carbohydrate , glycoside are found to be absent. The positive foam test indicate presence of saponin. The phenolic compounds are tannins are found to be present and hence it was decided to carry out screening of antioxidant activity.

Evaluation of Antioxidant Property:

Antioxidants are the chemicals that neutralize or scavenges free radicals or reactive oxygen species (ROS) [36]. Antioxidants may be defined as radical scavenger which protects the human body against free radicals that may causes pathological conditions [37] It is also reported that ROS is implicated is a wide range of human disease like atherosclerosis and certain cancer [38]. O_2^- and OH play an important role in the maintenance of process of inflammatory and as well as pain causing tissue damage [39].

In the present study free radical scavenging capacity of the extract is measured by DPPH (2, 2-diphenyl-1-picrylhydrazyl), showed in table 2. The IC_{50} value of ethereal extract was found to be 46.84 % which is more compared to IC_{50} value of ascorbic acid. The extract shows antioxidant property but less effective though it test positive for phenolic compounds and tannins.

Table 2: Radical scavenging capacity of the ether extract of *Vitex negundo linn* leaves.

Sr. no.	Concentration ($\mu\text{g/ml}$)	% Inhibition Ascorbic acid	% Inhibition Extract
1.	5	40.48	42.30
2.	10	45.09	43.39
3.	20	55.15	45.45
4.	30	59.39	46.466
5.	40	67.15	48.36
6.	50	68.00	50.78
IC_{50} value ($\mu\text{g/ml}$)		14.97	46.84

Conclusion:

The result of the present study reveal that the ether extract of the *vitex negundo linn* leaves extract shows the positive result for the alkaloids, carbohydrate, glycosides, proteins, amino acid, tannins and phenolic compounds. The sample also shows the good antioxidant property. The IC_{50} values of the ascorbic acid which is used as the standard reference is 14.97 and for the sample is 46.84.

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