



“PHYTOCHEMICAL ANALYSIS OF VITEX *NEGUNDO* LINN.”

Project Report

Under

**DBT Star College Scheme Department of
Biotechnology, New Delhi**

By

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Academic Year 2020-21



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Certificate

This is to certify that the work incorporated in the project report on “**Phytochemical analysis of Vitex Negundo Linn.**” by Miss. Rawade Kaveri Namdev, Miss. Kardile Dhanshri Sakhahari, Miss. Gaike Rupali Dnyaneshwar, Miss. Gawade Aarti Tabaji, Miss. Take Samiksha Sanjay are students of Arts, Commerce and Science College Sonai, Tal. Newasa, Dist. Ahmednagar. Affiliated to the Savitribai Phule Pune University Pune successfully completed project.

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Acknowledgment

It gives pleasure to express my sincere thanks to my research project guide **Prof. K. B. Arangale** for his timely help, constant support, encouragement, valuable suggestion and generous treatment right from beginning till the end of project.

We convey our special thanks to Hon. Shri. Prashant Patil Gadakh President of Mula Education Society, Sonai, Shri. U.M. Londhe (Secretary of MES, Sonai) and Dr. V.K. Deshmukh Joint Secretary of MES, Sonai.

We are also thank-full to Dr. S.L. Laware Principal and Dr. A.R. Tuwar Head of Department of Botany of the college.

We completed this project under DBT Star College Scheme so we are thankful to Department of Biotechnology, Government of India. Our sincere thanks to all our teachers of chemistry department for their encouragement and support. We are indebted to our parents and best friends for their support and encouragement whatever we invented to be in future is becomes of them.

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Declaration

We hereby declare that the work done in this thesis entitled “**Phytochemical analysis of Vitex Negundo Linn.**” is submitted to Department of Botany, Arts, Commerce and Science College Sonai. This project is completed under the DBTStar College Scheme and the supervision of **Prof. K. B. Arangale**. The works is original and not submitted in part or full by me or any other to this or any other University.

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INTRODUCTION:

Plants used in traditional medicine contain a vast array of substances that can be used to treat chronic and even infectious diseases. According to a report of World Health Organization, more than 80% of world's populations depend on traditional medicine for their primary health care needs. Our general public is gradually advancing towards natural formulations, which practically speaking are known to be very significant against an enormous exhibit of illnesses (Salehi et.al. 2020). Each culture all through the world has been utilizing home grown and characteristic results of people medication from hundreds of years. Different plant parts like leaves, bark, natural products, roots and seeds are utilized in treatment of different sicknesses. Nature comprises of various assets of chemical constituents and pharmaceutical uses and the normally accessible assets give an option in contrast to current medication in drug revelation (Koirala et. al. 2014). It had been accounted for that watery and methanolic removes from plants utilized in allopathic meds were possible wellsprings of antiviral, antitumor and antimicrobial specialists (Vlietinck et al., 1995). Normally accessible plants in conventional medication are the most cheap and effectively reachable wellspring of the managing in the essential medical care framework (Aryal et.al. 2019). Therapeutic plants are utilized to treat various illnesses (Panthi et. al. 2020), with in excess of 85,000 plant species being now perceived for clinical use universally, known to have antimicrobial, cell reinforcement, antidiabetic, antimalarial, anthelmintic, anticancer impacts (Koirala et.al. 2016) The demand for more and more drugs from plant sources is continuously increasing. It is therefore essential for systematic evaluation of plants used in traditional medicine for various ailments. Hence, there is need to screen medicinal plants for promising biological activity.

Home grown medications have become progressively famous and their utilization is far and wide. Obvious verification of their adequacy in microorganisms including pathogenesis is yet to be investigated. There is a need to create elective medications for the treatment of irresistible sicknesses from therapeutic plants (Mohanta et al., 2007). Normal antimicrobials can be gotten from plants (Zaika, 1975). The symptoms of medications accessible today constrain the revelation of new pharmacy co-restorative specialists from therapeutic plants (Cordell, 1993).

Five leaf caste tree *Vitex negundo* Linn. belongs to the Verbenaceae family, comprises 75 genera and nearly 2500 species and locally known as Simali in Nepali, Nirgandi (Hindi), and Nirgundi (Sanskrit) an important medicinal plant (Rizwan et.al. 2012), It is a deciduous shrub, occur in tropical to temperate regions (up to 2200 m from east to west). *Vitex negundo* Linn. is a woody, aromatic deciduous shrub growing to a small tree. It is an erect, 2-5 m in height, slender tree with quadrangular branchlets. The leaves have five leaflets in a palmate arrangement, which are lanceolate, 4-10 cm long, hairy beneath, and pointed at both ends. This plant is commonly found near bodies of water, recently disturbed land, grasslands, and mixed open forests. (Raghavendra et.al. 2010, Rahman et.al.1982). It thrives in humid places or along with watercourses in wastelands and mixed open forests and Native from tropical Eastern and Southern Africa and Asia, it is also found in Afghanistan, Bangladesh, India, Bhutan, Pakistan, Myanmar, Malaysia, and Nepal. It is grown commercially as a crop in parts of Asia, Europe, North America, and the West Indies, also finds use as a food crop and a source of timber (Vishwanathan et. al. 2010).

Ethno botanically, it is accepted that *Vitex negundo* Linn. is utilized for the treatment of jaundice (Kadir et. al. 2013), injuries (Halevy et. al. 1994), body throb (Sharma et. al. 2004), toothache (Hebbar et. al., 2004), asthma (Basavaraju et.al. 2009), eye treatment (Jain et al., 1984), and migraine (Bhandary et.al. 1995). *Vitex negundo* Linn. the bark is utilized as vaginosis and ophthalmopathy, while blossoms are utilized for cholera and the organic product as an anthelmintic. The whole plant is utilized for diuretic irritations, antipyretic, and sterile (Raama et.al. 2010, Rahman et.al., 1982, Alam et.al. 2003). *Vitex negundo* Linn. contains the distinctive class of auxiliary metabolites, as polyphenolic compounds, terpenoids, glycosidic iridoids, and alkaloids. Its leaves comprise viridiflorol, sabiene, 4-terpineol, and gamma-terpiene (Singh et.al., 1999), butanoic corrosive, p-hydroxybenzoic corrosive, oleanolic corrosive (Surveswaran et.al. 2007), angusid, nutrient C, nishindine, sitosterol (Khare, 2004). This plant likewise comprises of vetugnoside, negundoside, 5 hydroxy-7,4'- dimethoxy flavones (Gautam et.al, 2008). To the polyphenolic intensifies present in this plant, a high cancer prevention agent potential has been proposed, investi- gated by applying different perceived in vitro frameworks (Kumaravel et.al., 2010). p-Hydroxybenzoic corrosive and β -sitosterol have been the most regularly detached phenolic compounds from *Vitex negundo* Linn. Other than the above alluded bioactive impacts, it additionally shows against HIV, larvicidal (Gautham et.al, 2013), and mosquito repellent movement (Amancharla et. al, 1995). In this sense,

the current examination intended to describe the phytochemical and nourishing structure of *Vitex negundo* Linn. and to survey their cancer prevention agent and antimicrobial impacts.

Classification -

- Kingdom - *Plantae* - Plants
- Sub Kingdom - *Tracheobionta* - Vascular plants
- Super division - *Spermatophyta* - Seed plant
- Division - *Magnoliophyta* - Flowering plants
- Class - *Magnoliopsida* - Dicotyledons
- Subclass - *Asteridea*
- Order - *Lamiales*
- Family - *Verbenaceae*
- Genus - *Vitex* Linn.
- Species - *Vitex negundo* Linn. (Chaste tree).

MATERIALS AND METHODS:

Plant material

Fresh plants were collected from Sonai Tal. Newasa Dist. Ahmednagar (M.S.) India The plant *Vitex negundo* Linn. It was identified and authenticated at Department of Botany, MES, Arts, Commerce and Science College Sonai (Maharashtra). The leaves were separated from the plant washed, and shade dried then milled in to fine powder be a mechanical grinder.

Preparation of extract

Preparation of aqueous plant extracts: The plant material was wash tap water remove soil and dust particles and then dry in shady place temperature ($25 \pm 2^\circ\text{C}$). Plants leaves were crush in mixture and to make fine powder. Fifty grams of leaves powder was crush in 50ml of sterile distilled water using mortar and pestle. The extracts were filter double layered cheese cloth, and then through Whatman filter paper No.1. The Filter extracts centrifuged at 5000 rpm for 20 minutes supernatant was stored in sterilized bottle and labeled properly. Finally the filtrate was passed through syringe filter of $0.2 \mu\text{m}$ pore size for sterilization. The standard solution was stored at 4°C for further use [Kulshrestha *et.al.* 2015].

Preparation of ethanol /methanol plant extract: Leaves of the plants were thoroughly washed and dried under shade at the room temperature ($20 \pm 2^\circ\text{C}$). The dried leaves were then ground to a fine powder in an electric grinder. Stock solutions of the extract were prepared by adding ground leaf powder to 200 ml of each solvent (w/v, 1 g/ 10 ml). Methanol/ethanol solvents were used for extraction. Prepared extracts were then shaken for 6 hours for homogenous mixing of ground leaf powder in the solvent. After that each extract was passed through Whatman filter paper no.1. Final crude extract on a mini rotary evaporator under vacuum at 20°C and was utilized for the experiments [Edeoga *et al.* 2005].

Phytochemical Analysis: Phytochemical screening of ethyl acetate extract for the presence of these secondary metabolites: Alkaloids (Draggendorff's), flavonoids (Shibat'as reaction), Saponins (Frothing test), tannins (5% ferric chloride), Terpenoids (2, 4-dinitro-phenyl hydrazine), glycosides (fehling's solution), steroids (Liebermann's Burchard test) were evaluated according to the methods described by Edeoga *et al.* 2005.

RESULT AND DISCUSSION:

The phytochemical analysis of Ethanol and Methanol extract shows the presence of Alkaloids, Flavonoids, Tannin, Saponins and Terpenoids. Aqueous extract had showed the presence of Alkaloids, Flavonoids, and Saponins. In previous findings flavonoids were found to be effective antimicrobial substances against a wide range of microorganisms, probably due to their ability to form a complex with extra cellular, soluble protein and bacterial cell wall: In addition more lipophilic flavonoids may also disrupt microbial membrane. Secondary metabolites of plant origin appear to be one of the alternatives for the control of these antibiotic resistant human pathogens. The most important of their bioactive compounds of plants are such as alkaloids, flavonoids, tannins and phenolic compounds. This antibacterial activity may be due to the presence of secondary metabolites.

Table 1: Phytochemical analysis of different solvent extracts of *V. negundo* Linn.

Plants	Extract	Alkaloids	Flavonoids	Tannin	Saponins	Terpenoids	Glycosides	Steroids
<i>Vitex negundo</i>	Ethanol	+	+	+	+	+	+	+
Linn.	Methanol	+	+	+	+	+	+	+
	Aqueous	+	+	-	+	-	-	-

CONCLUSION:

The present study showed the phytochemical analysis the leaves of *Vitex negundo* Linn. Pharmacognostical studies like phytochemical analysis of leaf of *Vitex negundo* Linn. Provides valuable information to the identification and authentication of this plant materials. Preliminary phytochemical investigation of the phytochemical analysis of Ethanol and Methanol extract shows the presence of Alkaloids, Flavonoids, Tannin, Saponins and Terpenoids. Aqueous extract had showed the presence of Alkaloids, Flavonoids, and Saponins.

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