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Antibacterial Activity and Anti-inflammatory Activity VitexNegundo (Nirgudi) Plant Extract

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Abstract: *Vitexnegundo is commonly known as Nirgundi. It belongs to family Verbenaceae. Its plant is branched, deciduous shrub found in all parts of India. Nirgundi possess various medicinal properties. It is also well known to possess antibacterial properties. The aim of present work is to evaluate the antibacterial property of Nirgundi plant parts. Themethanol extract of Nirgundi stem, leaves and flowers were investigated against Escherichia coli and Staphylococcus aureus. It was reported in the study that the methanol extract of Nirgundi plant parts possess potent antibacterial property compared with the Streptomycin as a standard.Therefore, it is suggested to develop alternative antimicrobial drugs for the treatment of infectious diseases and Nirgundi plant parts can be used more and more for commercial purpose. The present study was undertaken to assess the anti-inflammatory effect of ethanolic extract of Vitexnegundo roots in rats. The anti-inflammatory action was studied by Plethysmometer method. The ethanolic extract of Vitexnegundo roots was screened for phytochemical analysis and revealed the presence of all components. The adult rats were divided into four groups of six each and maintained under ideal laboratory conditions. Group I was taken as control and group II treated with the standard drug Indomethacin (10 mg/kg), the ethanolic extract of Vitexnegundo root 200 mg/kg and 400 mg/kg were fed to group III and IV. It is observed that the ethanolic extract of Vitexnegundo roots shows considerable anti-inflammatory effect by using carrageenan induced rat paw edema method. The higher dose groups of Vitexnegundo root extract (400 mg/kg) were revealed more activity than their corresponding lower dose*

Keywords: Nirgundi, Plethysmometer method, Antibacterial Property, Vitexnegundo, Well Diffusion Method, Anti-inflammatory Property

I. INTRODUCTION

Vitexnegundo Linn is a large aromatic shrub (commonly known as Nirgundi, five leaved chaste tree) belonging to the family Verbenaceae. Almost all the parts of this plant possesses great medicinal values and it is employed as a remedy in various traditional systems of medicine like Ayurveda, Chinese, Siddha and Unani to treat various diseases. A popular quote of India which translates as – A man cannot die of disease in an area where *Vitexnegundo*Linn, Adhatodavasica and Acoruscalamus are found (provided that he knows how to use them). In Indian traditional medicine system *Vitexnegundo*Linn is referred as 'sarvaroganivarani' – the remedy for all diseases.[1]

Morphology

*Vitexnegundo*is an erect shrub or small tree growing from 2 to 8 m (6.6 to 26.2 ft.) in height. The bark is reddish-brown. Its leaves are digitate, with five lanceolate leaflets, sometimes three. Each leaflet is around 4 to 10 cm (1.6 to 3.9 in) in length, with the central leaflet being the largest and possessing a stalk. The leaf edges are toothed or serrated and the bottom surface is covered with hairs. The numerous flowers are borne in panicles 10 to 20 cm (3.9 to 7.9 in) in length. Each is around 6 to 7 cm (2.4 to 2.8 in) long and is white to blue in color. The petals are of different lengths, with the middle lower lobe being the longest. Both the corolla and calyx are covered with dense hairs.[2] The fruit is succulent globose and black when ripe with four seeds, rounded and about 4 mm in diameter.[3]

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Geographical Distribution

It grows in humid places or along water courses in wastelands and mixed open forests and has been reported to occur in India, Pakistan, Afghanistan, Sri Lanka, Thailand, Malaysia, eastern Africa and Madagascar. It is grown commercially as a crop in parts of Asia, Europe, North America and West Indies. It is used as a food crop and also as a source of timber. A large aromatic shrub, the plant is distributed throughout the greater part of India up to an altitude of 1500m in the outer region of Himalayas and some districts of Himachal Pradesh.[4]

Vernacular Names:-[1]

Language	Names
English	Five leaved chaste tree
Tamil	Nirkundi, Vellai-nochi
Telugu	Vaavili
Hindi	Shivari, Nirgundi
Malayalam	Vellanocchi, Indranee, Karunacci
Kannada	Nkkilu, Lakkigida, Nekka, Nakkigida
Punjab	Shwari
Assam	Aslok

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Bengal	Nirgundi, Nishinda
Gujarati	Nagod
Marathi	Nirgundi
Punjabi	Sambhalu, Banna
Sanskrit	Nirgundi

Taxonomic / Scientific Classification:-[1]

Kingdom	Plantae
Sub Kingdom	Tracheobionta
Super Division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Sub Class	Asteridea
Order	Lamilales
Family	Verbenaceae
Genus Species	Vitex Negundo

Medicinal Importance

Herbal medicine, not only preferably curing a particular disease, but aims at returning the body back to its natural state of health. The phytochemical components of medicinal plants often act individually, additively or synergistically for the improvement of health. After evaluating the various chemical components present in different parts of Vitexnegundo, it is essential that focus shifts to the medicinal applications of the plant. Myriad medicinal properties have been ascribed to Vitexnegundo and the plant has also been extensively used in treatment of a plethora of ailments.[5]

Traditional medicine

Traditional medicine mainly comprises of Indian Ayurveda, Arabic Unani medicine and traditional Chinese medicine. In Asia and Latin America, populations continue to use traditional medicine as a result of historical circumstances and cultural beliefs. Traditional medicine accounts for around 40% of all health care delivered in China. Up to 80% of the population in Africa uses traditional medicine to help meet their health care needs.[1]

Ayurveda

The plant finds mention in the verses of the CharakaSamhita which is unarguably the most ancient and authoritative textbook of Indian Ayurveda. Vitexnegundo has been designated as an anthelminthic and is prescribed as a vermifuge in the exposition on the CharakaSamhita by Sharma.

Other Ayurvedic uses of Vitexnegundo are described by Tirtha. People sleep on pillows stuffed with Vitexnegundo leaves to dispel catarrh and headache and smoke the leaves for relief. Crushed leaf poultice is applied to cure headaches, neck gland sores, tubercular neck swellings and sinusitis. Essential oil of the leaves isalso effective in treatment of venereal diseases and other syphilitic skin disorders.[6]

Unani medicine

Khare, outlines the applications of Vitexnegundo, commonly known as Nisinda in Unani medicine. The seeds are administered internally with sugarcane vinegar for removal of swellings. Powdered seeds are used in spermatorrhoea and serve as an aphrodisiac when dispensed along with dry Zingiberofficinale and milk.[1]

Chinese medicine

The Chinese Pharmacopoeia prescribes the fruit of Vitexnegundo in the treatment of reddened, painful, and puffy eyes; headache and arthritic joints.[1]

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Phytochemical Constituents

Phytochemical studies on Vitexnegundo Linn revealed the presence of volatile oil, triterpenes, diterpenes, sesquiterpenes, lignan, flavonoids, flavones, glycosides, iridoid glycosides and stilbenederivative.The detailed of phytochemical constituents is present in each part of the plant is given below.

Leaves: The leaves of Vitexnegundo Linn possess various chemical constituents such as.

SR.NO	PHYTOCHEMICAL CONSTITUENT	REFERENCE
1	Friedelin, vitamin-C, carotene, casticin, artemetin	[1]
2	terpinen-4-ol, α-terpineol, sabenine, globulol, spathulenol, β-farnesene, farnesol, bis(1,1dimethyl) methylphenol, α-pinene, β-pinene, linalool, terpinyl acetate, caryophyllene epoxide, caryophyllenol, vitexicarpin, viridiflorol	[7]
3	4,4″- dimethoxy-trans-stilbene, 5,6,7,8,3′4′5- heptamethoxy, 5-hydroxy-6,7,8,3′4′-pentamethoxy (5-Odesmethylnobiletin), 5-hydroxy-6,7,8,3′,4′,5-hexamethoxy(gardeninA), 5-hydroxy-6,7,8,4′-tetramethoxy (gardeninB), 5- hydroxy-7,3′,4′,5′-tetramethoxyflavone (corymbosin)	[8]
4	terpinen-4-ol, α-copaene, β-caryophyllene, β-elemene, camphene, α-thujene, α-pinene, sebinene, linalool, stearic acid and behenicacid	[9]
5	α-elemene, δ- elemene, β-elemene, β-eudesmol, camphor, camphene, careen, 1,8- cineol, 1-oceten-3-ol, γ-terpinine, α-phellendrene, β-phellendrene, α- guaiene, abieta-7,13-diene, neral, geranial, bornyl acetate, nerolidol, β-bisabolol, cedrol	[10]
6	2′-p-hydroxybenzoylmussaenosidic acid, agnuside, lagundinin, aucubin and nishindaside	[11]
7	viridiflorol, squalene, 5-hydroxy-3,6,7,3′,4′- pentamethoxy flavone, 5-hydroxy-3,7,3′,4′-tetramethoxy flavones, 5,3-dihydroxy- 7,8,4-trimethoxyflavanone, p-hydroxybenzoic acid, 3,4 – dihydroxybenzoicacid, luteolin-7-glucoside, isoorientin	[12]
8	3′-benzoyloxylhydroxy-3,6,7,4- tetramethoxyflavone, 5,3′-dibenzoyloxy-3,6,7,4-teramethoxyflavone,5,3′-Dipropanyloxy-3,6,7,4′-tetramethoxyflavone, 5,3-Dibutanoyloxy3,6,7,4-tetramethoxyflavone,5,3′-Dipenty4enoyloxy-3,6,7,4′ tetramethoxy flavone, 5,3-Dihexanoyl 3,6,7,4-tetramethoxyflavone	[13]
9	betulinic acid, ursolic acid	[14]
10	dimethoxyflavonone, 5,3′-dihydroxy-7,8,4′-trimethoxyflavonone, 7,8-Dimehylherbacetin-3-rhamnoside, vitegnoside	[15]
11	1,4a,5,7a tetrahydro 1βDglucosyl (3′,4′dihydroxybenzoyloxymethyl)-5-ketocyclopenta[c] pyran-4-carboxylic acid, luteolin-7-O-β-D-glucosid	[16]
12	6′-p-hydroxybenzoylmussaenosidic acid	[17]

Seeds

The seeds of *Vitex negundo* Linn have chemical constituents such as

SR.NO	PHYTOCHEMICAL CONSTITUENT	REFERENCE
1	n-Tritriacontane, n-hentriacontanol, n-hentricontane, n-nonacosane, β-sitosterol, phydroxybenzoic acid and 5-oxyisophthalic acid, 3, 4-dihydroxybenzoic acid,artemetin.	[18]

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2	3β-acetoxyolean-12-en-27-oic acid, 5β-hydro-8,11,13-abietatrien-6α-ol, 2α,3α-dihydroxyoleana-5,12-dien-28-oicacid, 2β,3α-diacetoxyoleana-5,12-dien-28-oicacid and 2α,3β-diacetoxy-18-hydroxyoleana- 5,12-dien-28-oic acid	[19]
3	vitedoin A, vitedoamine A, vitedoin B	[20]
4	5,7,3′-trihydroxy 6,8,4′-trimethoxy	[21]
5	6-hydroxy-4-(4-hydroxy-3- methoxy-phenyl)-3-hydroxymethyl-7-methoxy-3, 4-dihydro-2-naphthaldehyde	[22]

Stem and bark

The various chemical constituents present in the stem of *Vitex negundo* are tabulated

SR.NO	PHYTOCHEMICAL CONSTITUENT	REFERENCE
1	3,6,7,3′,4′-Pentamethoxy-5-Oglucopyranosyl-rhamnoside, vitexin cafeate, 4′-O-methyl myricetin- 3-O-[4′-O-β-D-galactosyl]-β-D-galactopyranoside	[23]
2	bark β-amyrin, epifriedelinol and oleanolic acid	[24]
3	Hepta methyl-phenyl-cyclotetra siloxane, Cyclo heptasiloxane,tetra decamethyl Nona methyl, phenyl cyclopenta siloxane, Cyclo octa siloxane,hexadeca methyl, Borazine, 2,4,6- tripheny-l1, 3, 5-tryophl, Nonamethyl, phenyl-cyclopenta siloxane , Tetracosamethylcyclododeca siloxane, penta methyl phenyl Disilane, Heptasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,-tetradeca methyl,3a,3a′-Dichloro-2α,3α - ethano-3β-methyl-cholestan-2a-one, Octadecamethyl, cyclonona siloxanes Cyclo octa siloxane, hexadeca methyl	[25]
4	p-hydroxy benzoic acid, β-sitosterol	[25]
5	5-hydroxy-3,6,7,3′4′-pentamethoxy flavone, 5-hydroxy-3′dihydroxy-7,8,4′-trimethoxy flavanone,3β-acetoxy-olean-12-en-27-oic acid, 3β-hydroxy-olean-5, 12-dien-28-oic acid	[26]

Roots

SR.NO	PHYTOCHEMICAL CONSTITUENT	REFERENCE
1	Vitexoside, agnuside, R-dalbergiphenol	[27]
2	negundin A, negundin B, 6-hydroxy-4-(4-hydroxy-3-methoxy)-3-hydroxymethyl-7-methoxy-3,4-dihydro-2-naphthaledehyde, vitrofolal E, (+)-lyoniresinol, (+)-(−)-pinoresinol, and (+)-diasyringaresinol	[19]
3	2β,3α-diacetoxyoleana-5,12-dien-28-oic acid;2α,3α-dihydroxyoleana-5,12-dien-28-oic acid, 2α,3β-diacetoxy-18-hydroxyoleana-5,12-dien-28-oic acid, vitexin and isovitexin	[23]
4	acetyl oleanolic acid, sitosterol, 3-formyl-4.5-dimethyl-8-oxo-5H-6,7-dihydronaphthofuran (a new furanoeremophilane)	[9]

Essential oil of fresh leaves, flowers and dried fruits

The various chemical constituents of essential oil of from leaves, flowers and dried fruits are listed

SR.NO	PHYTOCHEMICAL CONSTITUENT	REFERENCE
1	δ-guaiene, guaia-3,7-dienecaryophyllene epoxide, ethyl-hexadecenoate; α-selinene, germacren-4-ol;	[28]

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	caryophyllene epoxide, (E)-nerolidol, β-selinene, α-cedrene, germacrene D, hexadecanoic acid, p-cymene and valencene	
2	viridiflorol(19.55%), β-caryophyllene (16.59%), sabinene (12.07%), 4-terpineol (9.65%), γ-terpinene (2.21%), caryophylleneoxide (1.75%), 1-oceten-3-ol (1.59%), and globulol (1.05%)	[22]

Phytochemical testing:

Following tests were performed on the Ethanolic extract

Sr. no.	Test	Observation	Result
1	Alkaloids-Wagner's test	Reddish brown Precipitate	Negative
2	Carbohydrates-Fehling's test	Brick red precipitate	Positive
3	Anthraquinone Glycosides Borntrager's test	Ammonical layer appears Pink	Negative
4	Saponin Glycosides-Foam test	Persistant foam	Positive
5	Flavanoids-Shinoda test	Reddish purple color	Positive
6	Phenolics-Ferric Chloride test	Blue black color	Negative
7	Tannins-Gelatin test	White precipitate	Positive
8	Steroids-Salkowski test	Chloroform layer appears red and acid layer appears yellow	Negative

Organoleptic and Physico-chemical characters of *Nirgundi Ghana* of three samples[29]

	Characters	Result
1	**Color**	Brown
2	**Odor**	Characteristic
3	**Appearance**	Dark
4	**Taste**	Bitter
5	**PH (5% Aqu. solution)**	6.69
6	**Loss on drying at 1050C**	4.96
7	**Total ash**	10.22
8	**Acid insoluble ash**	0.82
9	**Water Soluble extractive**	83.68
10	**Alcohol Soluble Extractive**	52.106

Chromatography:[29]

Mobile Phase	Observations		Rf Value
	Under	**Color**	
Toulene: Ethyl Acetate: Formic Acid (6:4:0.3)	a) Visible Light	Yellow Fluorescence	0.44
	b) UV spectrophotometer short Wavelength(254nm	Light Yellow Fluorescence	
	c) UV spectrophotometer long Wavelength(365nm)	Pink Fluorescence	

Material and Method:-(2)

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Preparation of sample :-The collected samples of,Steam, leaves and flower were dried under the shade at the room temperature. The processed samples were pulverized using electric grinder. The samples were extracted independently using 100g of selected solvents like methyl alcohol in the order of highest extraction yield. The residues were recovered after the extracting with the solvents from a rotary evaporator, after that obtained extracts were suspended in the appropriate solvent for investigation.

Production of extracts:- In method of solvent extraction 30 g of dried powder of stem, leaves and flowers from Vitexnegundu, were separately extracted for 48 hours with methanol using a Soxhlet device. The extracts were filtered using Whatman filter paper No.1 and utilized to determine antibacterial activity.

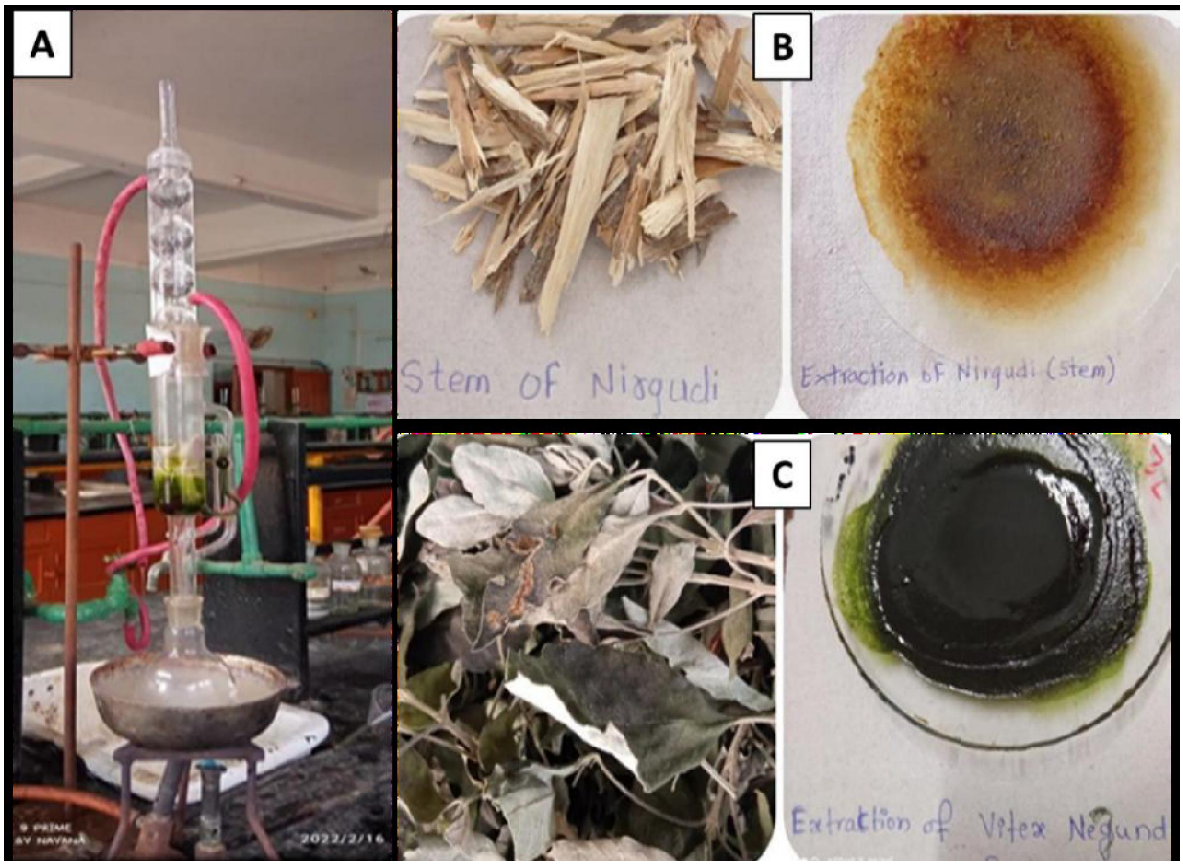

Fig. A. Soxlet extraction, B. Stem extract, C. Leaves extract

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Root Extraction:-About 400 gm of air dried coarse powdered was soaked with petroleum ether for 2 days. At the end of second day the powder was taken out and it was dried. After drying it was packed in 1000 ml soxhlet apparatus and extracted by using ethanol as solvent, till colour disappeared. The temperature was maintained at 55-65 0C. After that extract was concentrated by distillation and solvent was recovered. The final solution was evaporated todryness. The colour, consistency and yield (16.75% w/v) of ethanolic extract were noted.(1)

Antibacterial activity

Table 1: Bacterial cultures used in study

Sr No.	Bacterial Pathogens	MTCC Number
1	Escherichia coli	ATCC 8739
2	Staphylococcus aureus	ATCC 6538

Preparation of nutrient broth slants and sub - culturing of microorganisms:-Agar 1g, beef extract 500mg, peptone 500mg, and NaCl 250 mg were used to make nutrient agar medium and is dissolved in 50ml distilled water, boiled and then placed inside the test tubes, which was then closed with cotton plug and autoclaved at 15 pounds pressure for fifteen minutes. The test tubes which were containing the agar nutritional medium were placed in an inclined position for 30 minutes following sterilization. Thereafter, in an aseptic setting, pure cultures of E. coli (ATCC 8739) and S. aureus (ATCC 6538), were streaked over the surface of slants and the petri dishes were incubated at 370° C for 24 hours.

Production of growth medium for antibacterial sensitivity test: 20gm Agar, beef extract 10gm, peptone 10gm, and NaCl 5gm were mixed together and in 1000 ml boiling distilled water to create nutrient agar medium (pH 7.2). After that it was autoclaved in an autoclave at 15 pounds of pressure (1210 degrees Celsius) for exact 15 minutes. Following sterilization, the medium was allowed to cool to 450° C. before being placed into sterile Petri plates in a sterile manner, an amount of 20 - 25 ml of media poured into each petri plate. Medium from the petri plate was then kept aside to solidify at room temperature.

Inoculation of suspension of microbes on agar medium:

Sterilized, cotton plugs were dipped in to each standardized isolates (turbidity is adjusted so as to get consistent growth on the Petri plates) accompanied by whole petri plate surfaces were streaked with the swab three times exactly, the plates were rotated at 60° angle during streaking. After that the inoculums were dried for 1 - 5 min while covering during entire process. Then bore was punched on theprepared plates by using sterile well (8mm). The 100µl dose of standard medicine Ciprofloxacin was loaded in each bore accordingly in sterile conditions using a sterile micropipette. Plates were kept at an ambient temperature for at least 30 min and then cultured at 37^0 C for at least 24 hours. The diameters of the zones of inhibition were calculated with scale in millimetres.

II. RESULT AND DISCUSSION

The plant extract was tested against gram positive Staphylococcus aureusand gram negative bacteria Escherichia coli. Generally, gram negative bacteria are resistant than gram positive bacteria.[32] For the comparison, Streptomycin drug is used as standard with zone of inhibition 18 mm Methanolic extract of stems, leaves and flowers of Vitexnegundo had shown antimicrobial activity against E. coli with zones of inhibition 25 mm, 24 mm, 26 mm respectively. Maximum antimicrobial activity against E.coli was exhibited by flower extract of Vitexnegundo with zone of inhibition-26 mm. Methanolic extract of stem, leaves and flowers of Vitexnegundo had also shown antimicrobial activity against Staphylococcus aureus with zone of inhibition 18 mm, 19 mm, 19 mm respectively. Maximum antimicrobial activity against Staphylococcus aureus was exhibited by leaves and flowers extract of Vitexnegundo with zones of inhibition 19 mm. These zones of inhibition for various plant parts are higher while compared with the standard Streptomycin showing remarkable and potent activity. Several factors are known to influence the active principle present in the plant. Polarity of the extracting solvent greatly influences the antimicrobial property. The activity of plant extracts against both gram positive and gram negative bacteria may be an indicative of the presence of broad spectrum antibiotic

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compounds or simply general metabolic toxins([33] in the plant . Findings of the present study and previous works implicate the indication of the trial drug as a potent therapeutic agent for antibacterial property.

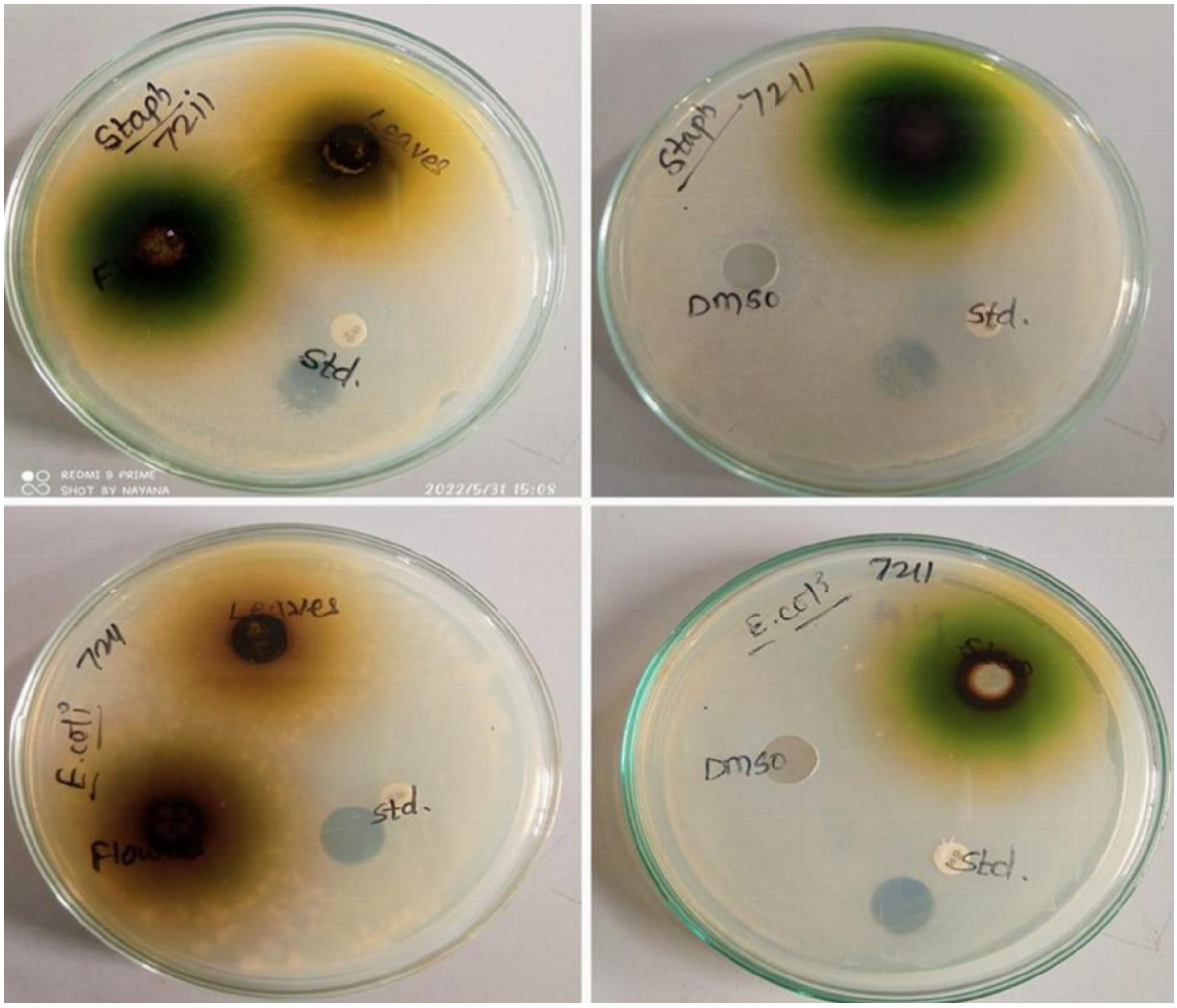

Fig Zones of inhibition

Sr. No.	Name of the microorganism	Diameter of zone of inhibition(mm)			
		Stem	Leaves	Flower	Streptomycin
1	Eschericia coli	25	24	26	18
2	Staphylococcus aureus	18	19	18	18

Table 2 Zone of inhibition for Escherichia coli and Staphylococcus aureus

Anti-inflammatory activity:-

Animals: Adult male albino rats weighing about 200-220 g were used for study. The animal room was well ventilated with a 12 h light/ dark cycle throughout the experimental period. They were maintained in clean, polypropylene cages and fed with Mona Laboratory animal feeds for rats/mice (Manufactured by Raman Dairy VikashUdyog and Marketed by PashuAahar Kendra, Varanasi, UP, India) and water ad libitum[34] Institutional Animals ~ 2 ~ International Journal of Herbal Medicine Ethics Committee (IAEC) approved the experimental protocol and care of animals was taken as per guidelines of CPCSEA, Department of Animal Welfare and Government of India.

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Carrageenan Induced Paw Edema:-[31]

Anti-inflammatory activity was evaluated by using theCarrageenan induced rat paw edema method13-14. After 16 hrof fast the rats were divided into four groups of three each.Group I - served as control group, received 1% CMC w/v. Group II - served as standard, received Indomethacin (10 mg/kg) Group III - served as test, received ethanolic extract of Vitexnegundo roots (200 mg/kg) Group IV - served as test received ethanolic extract of Vitexnegundo roots (400 mg/kg) After one hour the respective treatment 0.1 ml of 1% w/v Carrageenan suspension was injected subcutaneously into the plantar surface of the right hind paw. The paw volume was measured by using a plethysmometer immediately after 1, 2, 3, 4 h of carrageenan treatment. The anti-inflammatory effect of ethanolic extract of Vitexnegundo root was calculated by following equation. The anti-inflammatory (%) inhibition = [(A-B)/A] ×100 (ie) = [(1-B/A)] ×100 Where,

A- Represents the paw volume of control group.

B- Represents the paw volume of treated group.

Table : Anti-inflammatory activity by Carrageenan induced paw oedema method

Drug	**Dose**	**Carrageenan induced paw oedema (volume in ml)**					
		0hr	**60min**	**120min**	**180min**	**240min**	**300min**
Control	-	0.314±0.0082	0.31 ± 0.0057	0.34±0.0021	0.402± 0.0034	0.374 ±0.004	0.366±0.003
Vitexnegundo root extract	200 mg/kg	0.207 ± 0.006 (34.07)	0.265± 0.003 (14.51)	0.292± 0.003 (14.11)	0.23±0.0057 (42.78)	0.218 ±0.003 (41.71)	0.194±0.002 (46.99)
	400 mg/kg	0.22 ± 0.003 (29.93)	0.261±0.008 (15.80)	0.251±0.003 (26.17)	0.21± 0.005 (47.76)	0.179 ±0.004 (52.13	0.159±0.007 (56.55)
Standard	10 mg/kg	0.204± 0.003 (35.03)	0.264±0.008 (14.83)	0.261± 0.003 (23.23)	0.224± 0.006 (44.27)	0.15 ± 0.005 (59.89)	0.144±0.003 (60.65)

Statistical Analysis:- The results were presented as Mean ±S.E.M. One way analysis of variance (ANOVA) was followedby Dennett's-test for multiple comparisons statistical evaluation.

Result and Discussion

The result of anti-inflammatory activity by Carrageenan induced paw oedema method was tabulated in Table.The extract found to have significant ($P < 0.05$) antiinflammatory activity in rats. The extract at the test doses 200 and 400 mg/kg body weight reduced the oedema induced by Carrageenan by 46.99% and 56.55% respectively, where as the standard drug showed60.65% 5 h in table.

III. CONCLUSION

Methanol has stronger extraction capacity which could be helpful in extracting greater no of active constituents responsible for antibacterial activity. Our findings prove that, the stem, leaves and flowers of *Vitexnegundo*plant have medicinal antimicrobial activities and can use against microorganism under study. The results obtained in this study are promising which can be employed for commercial purpose. The ethno botanical use of plant origin is into existence since they were tested for their potentiality and also they were safe for human use. Thus the Sanskrit word for *Vitexnegundo* i.e. Nirgundi describes its medicinal importance. *"Nirgundishareeramrakshatiroghhyahtasmadnirgund"* literally means that which protect the body from disease.Therefore it can be used as antibacterial supplement and for the development of new therapeutic agent.TheVitexnegundo Linn extract found to have significant ($P < 0.05$) anti-

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inflammatory activity in rats. In the present study, the results revealed that administration of ethanolic extract of Vitexnegundo. Linn inhibited by edema starting from the first hour and during all phases of inflammation.

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