



Thermo-physicochemical investigation of molecular interactions in binary combination (dimethyl carbonate + methyl benzoate)

Measurements and correlation

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Abstract

To probe the nature of interaction and its deeds with temperature in the binary combination (dimethyl carbonate + methyl benzoate), the density (ρ)/speed of sound (u) be established for the total mole fraction array at $T = (308.15, 313.15$ and $318.15)$ K and at atmospheric pressure. Sign with magnitude of evaluated excess molar volume (V_m^E) was inspected and comprehensive analysis elucidated not only pervasiveness of strong molecular interactions between molecules but also its transform with temperature. Additional, strong interactions are properly hold up by partial and excess partial molar volume ($\bar{V}_m, \bar{V}_m^E, \bar{V}_m^{E,\infty}$). Additionally, relative association (R_A), Lennard-Jones repulsive power (n), excess isentropic compressibility (κ_s^E), partial and their excess partial molar isentropic compressibility (K_m, K_m^E), excess values of isobaric thermal expansion coefficient (α_P^E), isothermal compressibility (k_T^E), intermolecular free length (L_f^E), acoustic impedance (Z^E), ultrasonic speed (u^E) were evaluated and confirmed the deductions of V_m^E . By Redlich–Kister equation, standard deviations are computed through coefficients for excess parameters. At $T = 308.15$ K, V_m^E is correlated by theories of Prigogine–Flory–Patterson (PFP)/topology/Soave–Redlich–Kwong (SRK)/Peng–Robinson (PR) cubic equation of states; prophesied first-order derivatives of thermodynamic potentials; using semi-empirical equations, excess chemical potential/activity coefficients/theoretical speeds are estimated and correlated. Further, microscopic molecular properties are assessed at all temperatures by Sehgal's equations on nonlinear relations.

Keywords Density · Sound speed · Excess parameters · Prigogine–Flory–Patterson theory · Theory of topology · SRK/PR EoS · Activity coefficients · Nonlinear equations

Introduction

The thermo-physicochemical properties of the fluid and their combinations are explored for several reasons, mainly to predict the knowledge pertaining to molecular

interactions in liquid amalgamation [1], which comprise enormous employ in theoretical and applied sciences. It is accurately accepted information that the volumetric property is crucial in numerous manufacturing industries in assessments such as in modelling the magnitudes of boilers, condensers and storage deposits etc., [2, 3]. Acoustic examination in liquid blend can be used to ascertain the consequence of arrangement of donor constituents and

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Investigation of molecular interactions in binary liquid mixture: Measurements and correlation through thermo physicochemical study

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ABSTRACT

Density (ρ)/acoustic speed (u) of sound have been experimentally measured over the complete mole fraction on (dimethyl carbonate + diisopropyl ether) mixture at $T = (308.15/313.15/318.15)$ K and atmospheric pressure. Investigational data have been used to gauge excess molar volume /partial molar volume/excess partial molar volume/excess values of intermolecular free length/isentropic compressibility/acoustic impedance/isobaric thermal expansion coefficient/isothermal compressibility/surface tension. Extended Langmuir model pertinent to surface tension was applied to check the depth of penetration of molecular interactions between molecules. The excess values were fitted to Redlich-Kister equation and subsequently standard deviations are evaluated from coefficients. The departures of computed excess properties were explored in terms of molecular interactions. Experimental excess molar volume in the existing adventure was correlated by Prigogine Flory Patterson (PFP) theory/Souze-Rodriguez-Kwong (SRK) CEoS/Peng-Robinson (PR) CEoS at 308.15 K. Theoretical excess chemical potentials are computed and correlated by Margules/Porter/Wilson and VanLaar models at 308.15 K. Furthermore, vital thermodynamical potential derivatives are worked out at all temperatures through physicochemical properties rather calorimetric experiments. Contemporary study also consists of estimation and correlation of cohesive energy ΔA , Van der Waals constants (a , b), distance of closest approach (d) by Hartmann, Balizar and Ballou non-linear equations at all temperatures.

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1. Introduction

With the wide range of indispensable properties, binary and multi component liquid mixtures rather than pure liquids are of great significance in several chemical, industrial and biological processes. The study and dependency of volume/acoustic properties of multi-component mixtures on concentration/temperature is a useful indicator in chemical engineering estimations [1]. Further, thermodynamics are essential for prediction of the complicated molecular interactions and mechanisms of the liquid mixtures [2]. The check of the obtainable empirical relations and the progress of new techniques for prediction of molecular interactions/derivatives of potentials, have exacting implication because they are the only way to ensure precise results and are having immense use in theoretical, practical considerations. Furthermore, the advantages of information of physicochemical parameters over calorimetric experiment in liquid systems have importance in both theoretical and investigational portions [1]. The conclusions of such study are frequently used in diverse processes of chemical and industrial sectors.

In this paper we report excess properties and derivatives of thermodynamic potentials for binary mixture of dimethyl carbonate (DMC) +

diisopropyl ether (DIPE) in the temperature range from 308.15 K to 318.15 K. The liquids are selected basing on their industrial applications. Dimethyl carbonate (DMC) is an eco-friendly, low toxic chemical and used in petroleum [3]/battery science [4]. Diisopropyl ether (DIPE) is secondary ether and being used as solvent in various chemical processes. It is colorless and slightly soluble in water, but more soluble with organic solvents. It is categorized under Oxygenated compounds. It is generally added to gasoline to enhance fuel ignition competence/antiknocking property and to lower emanation of carbon monoxide/hydrocarbons.

Organized explorations of the physicochemical properties of dimethyl carbonate (DMC) with molecular organic solvents have been available in literature [5–8]. Lugo et al. [5] gauged the p/u in (DMC + octane) system. They derived $k_2/\alpha_p/\eta_1$ at (278.15–353.15) K up to 25 MPa pressure range. Shin et al. [6] gauged p /refractive indices/viscosity (η) in (DMC + DPC) system. Iglesias et al. [7] measured p /refractive index in (DMC + Bmim)[BF₄] system. Chen et al. [8] gauged p/u at temperatures (293.15 to 333.15) K in the atmospheric pressure in (DMC + γ -GBL) system.

Methodical explorations of the physicochemical properties of diisopropyl ether (DIPE) with single or with other liquids have been reported. The authors Zhao and Jiangtao Wu [9] studied surface tension and density of diisopropyl ether from (248 to 373) K. Gonzalez-Olmos et al. [10] reported experimental data of density

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A study on physico-biochemical efficiency of LBG 17 a Blackgram (*Vigna mungo* L. Hepper) genotype against powdery mildew

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Abstract: LBG 17 is a resistant inbred of Blackgram developed from susceptible parents *Nethiminumu* and *chikkuduminumu* to defend the damage due to powdery mildew. In present study the physiological efficiency of LBG 17, *Nethiminumu* and *chikkuduminumu* over powdery mildew was studied in terms of chlorophyll, phenols, soluble proteins, soluble carbohydrates, total carbohydrates, peroxidase, superoxide dismutase and polyphenol oxidase. Powdery mildew effect on yield efficiency was also studied in LBG 17, *Nethiminumu* and *chikkuduminumu* in terms of seeds per pod, 100 seed weight, number of pods and yield per acre and correlated with the respected physiological and biochemical parameters. The chlorophyll content (mg/g), soluble proteins (µg/mg), total carbohydrates (µg/mg) were highest in resistant variety on fungal infection whereas these characters recorded less in susceptible cultivars. The activity of phenols (µg/mg), peroxidases (µg/mg), super oxide dismutase (µg/mg) and polyphenol oxidase (µg/mg) were significantly increased in tolerant genotype compared to its susceptible parents. Significant variation in the protein molecular mass of LBG 17 was also observed at 66 KD over its parents. The regression analysis studies revealed that the increased physico, biochemical activities in LBG 17 showed a positive correlation with the increased yield which in turn confirm the inherent ability of this genotype over its parents against powdery mildew.

Keywords: Blackgram, Powdery mildew, Hybrid vigour, LBG 17, Biochemical, Superoxide dismutase

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I. Introduction

The reactive oxygen species (ROS) such as superoxide radicals (O_2^-), hydrogen peroxide (H_2O_2), OH, are chemically active molecules which were produced by the plants during pathogen attack [1]. Formation of these ROS indicates that these are initial cellular responses exhibited by plants upon successful pathogen recognition. However, the enhanced ROS inside the cells results in cellular damage and destroy macromolecules like proteins, pigments, lipids and nucleic acids [2]. In order to overcome the damage caused by ROS, plants accommodate with antioxidant enzymes like POX, PPO, SOD and CAT [3]. On the other side phenolic compounds can assist plants in protecting cells from free radicals formed due to reactive oxygen species [4, 5]. Yield loss in pulses is increasing year by year due to these unwanted biotic factors [6].

Blackgram (*Vigna mungo* L. Hepper) is one of the most ancient and important pulse crop of Asia, found to be originated in India. It is having more nutritional quality and suitable to all types of cropping systems. It is commonly known as "poor man's meat" as it is dietary protein for the large section of vegetarian population of Indian Sub Continent with a seed protein content of 24% [7]. In India, Andhra Pradesh is one of the major blackgram cultivating states with an yield of 13.74 lakh tonnes from an area of 32.99 lakh ha with a productivity of 417 kg/ha. In spite of cultivating in large area, the productivity was decreasing year by year; this decrease in productivity is may be due to the low genetic yield potentiality, different biotic and abiotic stresses. Among the biotic stresses, diseases due to fungal or bacterial are responsible for an estimated yield loss of about 20 to 30% [8]. Among the foliar fungal diseases of blackgram powdery mildew found to be significant caused by *Cercospora* results in major yield losses. The powdery mildew occurs throughout the year under favourable conditions and it is more severe in late sown *kharif* crop. Hence, the use of fungicides has become inevitable in controlling the foliar diseases in the absence of suitable resistant cultivars. On the other hand development of powdery mildew tolerant varieties found to be a good remedy to stabilize the blackgram yields. Regional Agricultural Research Station (RARS), Lam, Guntur had developed a variety of blackgram LBG 17 resistant against powdery mildew by crossing *Nethiminumu* and *Chikkuduminumu*. In present study we aimed at to determine and compare the physiological, biochemical and yield alterations during powdery mildew infection in tolerant LBG 17 and recessive parents *Nethiminumu* and *Chikkuduminumu*.



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PHYTOCHEMICAL ANALYSIS OF *OROXYLUM INDICUM* LEAF EXTRACTS ALONG WITH SCREENING FOR ANTIMICROBIAL AND ANTIOXIDANT PROPERTIES

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Abstract

Oroxylum indicum belongs to family: Bignoniaceae (Jacaranda family) commonly known as Broken bones tree is widely distributed throughout South East Asia and India. The endangered forest tree known as *Oroxylum indicum* is having many unexplored medicinal properties. To report different phytochemicals like sterols, saponins, glycosides, flavonoids, alkaloids, tannins, phenols and quinones various tests were performed. The results of these phytochemical testing of crude methanol and ethanol extracts from leaves of *Oroxylum indicum* showed the presence of many important compounds used in the cure of various human ailments. The preliminary phytochemical screening study revealed that the leaf of *Oroxylum indicum* has presence of Flavonoids, Saponins, Alkaloids, Sterols, Tannins, Phenolic Compounds, Fats and Oils, Glycosides, lignins. Whereas Anthraquinones, Anthocyanides, Coumarins, Proteins, Carbohydrate, Indoles, Reducing sugars and Aminoacids are found to be absent in both the extracts. The extracts from *O. indicum* leaves collected from different provinces in Panchalokana of Nellore district were prepared by decoction and maceration with methanol, ethanol and evaluated their antimicrobial effects on three clinically isolated bacteria, *Bacillus subtilis* MTCC 441, *Staphylococcus aureus* MTCC 731, *Pseudomonas aeruginosa* MTCC 1033 and a fungal pathogen *Candida albicans* MTCC 3048 using disc diffusion assay. Methanol and ethanol extracts from *O. indicum* leaves at the concentration of 1000 mg/mL exhibited maximum antibacterial activity against *Staphylococcus aureus* with an inhibition zone of 15.9 mm and 14.1mm respectively. But it has no inhibitory effect on *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Candida albicans*. The methanol and ethanol extracts from the leaves of this plant scavenged DPPH(1, 1-Diphenyl-2-picrylhydrazyl) free radicals with 65% and 63% inhibition and nitric oxide free radicals are scavenged by 72% and 71% respectively. The present study revealed the antioxidant potential of leaves of *Oroxylum indicum*. 2,2-diphenyl 1-picrylhydrazyl (DPPH), and Nitric oxide are used as free radicals and scavenging potential and reductive ability assay of methanol and ethanol extract of leaves were performed to evaluate the inhibition percentage. From the results, it is clearly understood that the extracts from *O. Indicum* leaves have antioxidant effect along with antimicrobial nature, on clinically isolated pathogenic bacteria and it could be used for medicinal and pharmaceutical purposes in the future.

Keywords: *Oroxylum indicum*, Phytochemical analysis, Bioactive compounds, Antimicrobial and Antioxidant properties, Free radical Scavenging activity, Disc diffusion assay.

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INFLUENCE OF SOIL ELEMENTS ON PHOTOSYNTHESIS AND SECONDARY METABOLITES IN SELECTED MEDICINAL PLANTS

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ABSTRACT: The influence of mineral nutrients on photosynthesis and production of secondary metabolites was studied and analyzed in the plants *Alstonia scholaris*, *Tabebuia argentea* and *Jacquinia barbasco* growing in Botanical Garden of Acharya Nagarjuna University, Guntur during 2015 and 2016. Of all the plants maximum mineral nutrients uptake was observed in *T. argentea*. The rate of photosynthesis (A_{max}), rate of transpiration (E) and stomatal conductance (g_s) were found to be more in *T. argentea* i.e $7.09 \mu\text{moles m}^{-2}\text{s}^{-1} \text{ CO}_2$, $2.95 \text{ mmol m}^{-2}\text{s}^{-1}$ and $0.07 \text{ mmol CO}_2 \text{ m}^{-2}\text{s}^{-1}$ respectively. Results also indicated that an optimum accumulation of mineral nutrients increased the rate of photosynthesis and secondary metabolite production in *T. argentea*.

KEYWORDS: photosynthesis, soil nutrients, phytochemicals, secondary metabolites.

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1.INTRODUCTION

Photosynthesis is a key physiological process influences all other cellular activities by providing ATP requirements. Adenosine tri phosphate produced during phosphorylation reactions not only utilized in sugars production but also involved in synthesis of so many metabolic intermediates and precursors for various secondary metabolites [1,2,3]. But the rate of photosynthesis depends on so many factors. Availability of minerals is one of such factors regulating the photosynthetic process [4]. These mineral nutrients may include both macro and micro elements/nutrients such as N, P, K, Zn, Fe, Mn, Mg, Cu and S. Of these mineral nutrients some are metal ions. These metal



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A STUDY ON PHYTOCHEMICAL COMPOSITION, GC-MS ANALYSIS AND ANTI-MICROBIAL POTENTIAL OF METHANOLIC LEAF EXTRACT OF *ALSTONIA SCHOLARIS* (L.) R. BR.

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Keywords:

Alstonia scholaris, Bio-active compounds, Spectrophotometer, UV-Vis, FTIR, GC-MS

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ABSTRACT: The present study was carried out to assess the various phytochemical composition, GC-MS analysis, and antimicrobial potential of methanolic leaf extract of *Alstonia scholaris* (L.) R. Br. by using different solvents. Phytochemical analysis revealed the presence of alkaloids, coumarins, flavonoids, glycosides, phenols, quinines, saponins, tannins, steroids and terpenoids. Susceptibility testing by Agar well diffusion assay showed significant antimicrobial activity with ethyl acetate and methanol extracts of leaves against bacterial strains such as *Bacillus subtilis*, *Bacillus cereus*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli* and fungal strain *Candida albicans*. The methanolic leaf extract exhibited better antimicrobial activity than ethyl acetate extract. The UV-Vis, FTIR, and GC-MS have been employed to characterize the bioactive compounds present in methanolic leaf extract of *Alstonia scholaris*. The crude extract was scanned in the wavelength ranging from 200-900 nm by using Perkin Elmer Spectrophotometer, and the characteristic peaks were detected. The FTIR spectrum confirmed the presence of alcohol, alkanes, amides, alkyl aldehydes, halogen, and aromatic compounds. The results of the GC-MS analysis provide different peaks determining the presence of 9 phytochemical compounds with different therapeutic activities. The major phyto constituents were oxime-methoxy-phenyl, 2-methoxy 4-vinyl phenol, 2(4H)-Benzofuranone 5, 6, 7, 7a-tetrahydro-4, 4, 7a trimethyl, (-)-Loliolide, Neophytadiene, Hexahydrofarnesyl acetone, Phytol, 4, 8, 12, 16-Tetramethylheptadecan-4-olide, and Squalene.

INTRODUCTION: The use of plants as therapeutic agents, in addition to being used as food, is age-long and there is a great awareness in the use and significance of these medicinal floras¹. Plants are a rich source of secondary metabolites with interesting biological activities.

In general, these secondary metabolites are an important source with a variety of structural arrangements and properties².

Natural products from microbial sources have been the primary source of antibiotics. But with the increasing recognition of herbal medicine as an alternative form of health care, the screening of medicinal plants for active compounds has become very significant³. The active substances of many drugs found in plants are secondary metabolites⁴ such as alkaloids, phenols, tannins, saponins, flavonoids, terpenoids, glycosides and lactones⁵.

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RESEARCH ARTICLE

GC-MS PROFILE, ANTIBACTERIAL, ANTIFUNGAL, AND ANTICANCER ACTIVITY OF ROOT OF
VANDA TESSELLATA AN EPIPHYTIC ORCHIDNunna Venkata Ramana¹, P.K Ratna Kumar² and Bandaru Venkateswara Rao³

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Abstract

Background: The presence of phytochemical constituents has been reported from species of the Orchidaceae. Hitherto no reports exist on the GC-MS Profile of *Vanda tessellata* Hook. Ex G. Don which was an epiphyte from the sacred grove of Penchalikona of Andhra Pradesh.

Objective: The current study was to determine the antibacterial, antifungal, anticancer activities, and GC-MS profiles of the root of *Vanda tessellata* Hook. Ex G. Don.

Materials and Methods: The root of the *Vanda tessellata* Hook. Ex G. Don which was an epiphytic orchid from the sacred grove of Penchalikona of Andhra Pradesh.

An *in-vitro* evaluation of antibacterial and antifungal activity was performed by disc diffusion method and dilution technique, and anticancer activity was performed by SAB assay.

Gas chromatography-mass spectrometry (GC-MS) analysis of the root extracts of *Vanda tessellata* Hook. Ex G. Don was performed on GC-MS equipment (GCMSQP2010, SHIMADZU).

Results: The GC-MS profile has shown the presence of different phytochemical compounds in the epiphytic root of *Vanda tessellata* Hook. Ex G. Don. A total of 33 compounds were identified. Furthermore, the results of antibacterial and antifungal tests (both primary and secondary) shown that substantial antibiotic activity, and the anticancer activity results are shown inactivity.

Conclusion: From the results, it is evident that epiphytic root extracts of *Vanda tessellata* Hook. Ex G. Don has shown substantial antibacterial, and antifungal activity and GC-MS profile revealed the 33 analytes confirming the root was a source of therapeutic compounds useful for the pharmaceutical applications.

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Introduction:-

Epiphytes are extreme specialists adapted various morphological and physiological characters for their survival. Scientists summarised some important applications of orchids in controlling fevers, curing eye diseases, treating fatigue, headaches and their function as anticancer agents [15]. Orchidaceae is the second-largest angiosperm family in India, consisting of about 990 Genera. Nine species of orchids used for medicine in south India [25].

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GC-MS profile, antibacterial, antifungal and anticancer activity of leaves and roots of *Vanda testacea* an epiphytic orchid

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ABSTRACT

The presence of phytochemical constituents has been reported from species of the Orchidaceae. Hitherto no reports exist on the antibacterial, antifungal and anticancer activity and GC-MS Profile of *Vanda testacea* which was an epiphyte from the sacred grove of Srisailem of Andhra Pradesh. The current study was to determine the antibacterial, antifungal, anticancer activities, and GC-MS profiles of the leaves and roots of *Vanda testacea*.

The test material was the leaf and root of the *Vanda testacea* which was an epiphytic orchid from the sacred grove of Srisailem of Andhra Pradesh. An *in vitro* evaluation of antibacterial and antifungal activity by disc diffusion method and dilution technique, and anticancer activity by SAB assay. Gas chromatography-mass spectrometry (GC-MS) analysis of the effective leaf and root extracts of *Vanda testacea* was performed on GC-MS equipment (GCMSQP2010, SHIMADZU).

The GC-MS profile has revealed the presence of different phytochemical compounds in the leaf and root extracts of *Vanda testacea*. A total of 19 compounds were identified. The finding of the majority of antiviral compounds with GC-MS Peak area% 71.1% and 27.4% Dimethyl sulphide in methanolic leaf and root extracts, similarly 99.94% and 99.88% of Di-malic disodium salt in ethyl acetate leaf and root extracts indicated the antiviral nature of the species. Furthermore, the results of antibacterial and antifungal tests (both primary and secondary) shown antibiotic activity, and the anticancer activity results are shown inactivity.

From the results, it is evident that bioactive compounds present in the leaf and root extracts of *Vanda testacea* has shown strong antibacterial, and antifungal activity confirmed the pharmaceutical applications of the leaves and roots. GC-MS profile of leaf and root extracts revealed the presence of a majority of antiviral compounds proven that species has potent antiviral properties.

Keywords: Epiphytes, Orchidaceae, antibacterial activity, antifungal activity, methanol, n-hexane and ethyl acetate, Disc diffusion method, Dilution technique, SAB assay, GC-MS analysis.

INTRODUCTION

Epiphytes are extreme specialists adapted various morphological and physiological characters for their survival. Scientists summarized some crucial applications of *Vanda* genus in controlling fevers, curing eye diseases, treating fatigue, headaches and their function as anticancer agents [1]. Orchidaceae is the second-largest angiosperm family in India, consisting of about 990 Genera. Nine species of orchids used for medicine in south India [2]. *Vanda testacea* and its medicinal uses presented in Table-1

MATERIALS AND METHODS

This species (Fig-1) was collected from the Srisailem forest region. Where Lord Shiva temple, the famous shrine located which was present on the right bank of the Krishna river in Kurnool district of newly formed state Andhra Pradesh. It was located at an altitude of 476 m above the sea level, at Latitude 16 12" N and Longitude of 78 5" E.

Table 1: *Vanda testacea* and medicinal uses

Plant name	Part	Uses	Reference
<i>Vanda testacea</i>	leaves	Antiviral, Ear-ache	[3]
		Bone fracture	[4]
	hydro-alcoholic extracts of leaves	peripheral neuropathy, antioxidant activity,	[5]



IN VITRO EVALUATION OF ANTIBACTERIAL ACTIVITY OF CERTAIN EPIPHYTIC ORCHIDS

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ABSTRACT

In vitro evaluation of antibacterial activity by disc diffusion method carried out on epiphytic roots and leaves of *Vanda tessellata* Hook. Ex G. Don (NV01) from Penchalikona, *Vanda tessellata* Hook. Ex G. Don (NV16) and *Vanda testacea* Rchb.f.(NV03) from Srisaillam, *Acampe praemorsa* (Roxb.) Blatt. & McCann (NV06) and *Vanda tessellata* Hook. Ex G. Don (NV14) from Talakona and *Acampe praemorsa* (Roxb.) (N V11) Blatt. & McCann from Tirumala with three solvents Methanol, N-Hexane and Ethyl acetate. Except N-Hexane roots and Leaves of these plants shown substantial anti - bacterial activity.

KEYWORDS: Epiphytes, Orchidaceae, Antibacterial activity, Methanol, N-Hexane, Ethyl Acetate, Disc diffusion method

INTRODUCTION

An exhaustive survey of literature revealed that studies on the epiphytes which are special groups of plants are comparatively limited. Epiphytes are extreme specialists adapted to climatically and ecologically harsh conditions in the canopy; they represent an important and interesting plant group. A global assessment of the uses and misuses of orchids including epiphytic species in medicine was made and summarised some important uses of orchids in controlling fevers, curing eye diseases, treating fatigue, headaches and their function as anticancer agents. Even though there are several scattered works on the ethnobotanical and ethnomedicinal aspects related to the epiphytes of several other parts of India and neighbouring areas, only a few are available on those of Andhra Pradesh.

Orchidaceae is the second largest family in India, consisting of about 990 Genera. Rajendran *et al.*, (1997) reported medicinal uses of nine species of orchids of southern India.

MATERIALS AND METHODS

In the present study, (four species of genus *Vanda*) and two species of genus *Acampe*) ecotypes were collected from different forest regions of Andhra Pradesh. All the plant species selected for the present study are epiphytes belong to the Orchidaceae family. The tested species are collected from different regions are duly authenticated by Botanical Survey of India (B.S.I), Deccan regional center, Hyderabad. Herbarium specimens of each of the species have been maintained separately in the lab. The list of the species tested is presented in Table.1. The three different species tested in the present study are viz 1. *Vanda tessellata* (NV01) (Penchalikona forest region) 2. *Vanda testacea* (NV03) (Srisaillam forest region) and 3. *Acampe praemorsa* (NV06) (Talakona region). Besides, two *Vanda tessellata* (NV14 and NV16) species have also been collected from two different regions (Talakona forest region and Srisaillam forest regions respectively), and one *Acampe praemorsa* (NV11) collected from Tirumala forest region, which are morphological variants to 1 and 3 respective species referred to as 'ecotypes'. (Fig-1)



IN-VITRO STUDIES ON ANTIBACTERIAL ACTIVITY OF SOME MISTLETOE SPECIES.

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ABSTRACT

In vitro evaluation of antibacterial activity was carried out on leaf extracts of *D. falcata*, *D. falcata* var *pubescens*, *V. monilicum* and *V. orientale* and stem extracts of *D. falcata*, *D. falcata* var *pubescens*, *V. articulatum* and *V. orientale* in three different solvents viz., methanol, n-hexane and ethyl acetate against four bacterial strains viz., *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli* and *Pseudomonas aeruginosa* by using disk diffusion method. Among the test species, all the three solvent extracts of *V. monilicum* were shown to be effective against the four bacterial strains. Overall, ethyl acetate extracts of both leaf and stem of the tested species exhibited higher inhibitory activity compared to its methanol and n-hexane counterparts.

KEYWORDS: mistletoe, Antibacterial activity.

INTRODUCTION

Mistletoes are semi-parasitic evergreen shrubs prevail in tropical and subtropical climates worldwide and are widely distributed throughout India. Of about 1300 species of Mistletoes, majority of them fall into two families Viscaceae and Loranthaceae in the order Santalales (Calder, 1983). Mistletoe, with distinct habit, have been reported to exist on more than 300 different host plants (Sampatkumar and Selvaraj, 1981) & (Shanavaskhan *et al.*, 2012).

Mistletoes considered to be hemiparasites as they live on host plants and derive water and minerals by haustorial connections. However, they perform photosynthesis activity at some point of time in their life cycle (Barlow, 1987) (Richter & Popp, 1992, 1998). As there is no phloem connection with the host, organic substances of the host are only transported via xylem that includes amino acids, cyclohexoids and thiols etc. Often the quality and quantity of various phytoconstituents of a hemiparasite influenced by its host plant. Many reports indicate that mistletoes have higher nutrient concentrations than their host (Lamont, 1983) (Karunaichami *et al.*, 1993).

Though various species of Mistletoe have been used historically as a medicinal herbs in the curative methods of high blood pressure, infertility, epilepsy, cancer and

arthritis problems etc., however, exhaustive exploration of their ethanomedicinal values are comparatively very meager (Karola Maul *et al.*, 2018). (O'Neill *et al.*, 2019).

MATERIAL AND METHODS: In the present study, (one species and one variety of genus *Dendrophthoe*) and three species of genus *Viscum*) were collected from different forest regions (Srisailem & Talakona) of Andhra Pradesh. All the plant species selected for the present study are Hemi parasitic flowering plants belong to the families Loranthaceae and Santalaceae. The tested species are collected from different regions (Srisailem & Talakona) are duly authenticated by Botanical Survey of India (BSI), Deccan regional centre, Hyderabad. Herbarium specimens of each of the species have been maintained separately in the lab. The list of the species tested is presented in Table.1 & Fig-1



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RESEARCH ARTICLE

IN-VITRO STUDIES ON ANTIFUNGAL ACTIVITY OF SOME MISTLETOE SPECIES

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Mistletoes, Antifungal Activity, Disc-Diffusion Method

Abstract

In vitro evaluation of antifungal activity by disc diffusion method was carried out on leaf extracts of *D. falcata*, *D. falcata* var *pubescens*, *V. monoicum* and *V. orientale* and stem extracts of *D. falcata*, *D. falcata* var *pubescens*, *V. articulatum* and *V. orientale* using three different solvents viz., methanol, n-hexane and ethyl acetate. The antifungal activity was tested on three fungal strains include *Fusarium oxysporum*, *Phytophthora infestans*, *Sclerotium rolfsii*. Overall leaf extracts exerted better inhibitory activity than stem counterparts. Among all, only *V. orientale* was effective against the three fungal species. Compared to stem extracts, leaf extracts of *D. falcata* var *pubescens* have shown higher antifungal activity.

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Introduction:-

About 80% of the world's population depend on traditional medicine for primary health care (Ekhaie and Okoruwa, 2001). Traditional medicine involves the plant extract-derived medicines for about 85% (Si-Yuan Pan et al., 2013). About 250,000 to 300,000 plant species which exist on Earth, around 5000 plant species only were investigated for chemical compounds with pharmacological and biological activities and more than 25% of pharmaceutical molecules are plant based. The 200,000 known secondary metabolites are grouped into phenolics, terpenoids, steroids and alkaloids which have significant functions in plants and the bioactive secondary metabolites identified with a broad range of pharmacological and therapeutic potentials (Pandita and Pandita 2021).

The plant derived antifungal compounds will create promising antimycotics for human mycotic diseases. Fungal infections can lead to death, particularly for immune compromised patients and with opportunistic infections (Rathi Sanjesh Kumar Gotam 2013). The number of patients suffering from invasive fungal infection is increasing among organ transplant recipients, haematological patients undergoing hematopoietic stem cell transplantation, AIDS, cancer, immunosuppressive therapy, chronic pulmonary diseases, major surgery, etc. (Ibanez-Martinez et al., 2017). Due to its high mortality rate, there is a need for discovery of new and potential antifungal drugs.

Pathogenic fungi are the infectious agents in plants and humans, causing alterations during developmental stages, including post-harvest. In fruit and vegetables, there is a wide variety of fungal strains, causing certain aspects such as decline in quality, nutritional value, organoleptic characteristics, and limited shelf life (Agrios, 2004). Phytopathogenic fungi are controlled by synthetic chemicals on usual practice; however, synthetic chemicals are not ecofriendly and use of such synthetic chemicals is restricted due to the harmful effects on human health and the environment (Harris et al., 2001). The spread of multidrug-resistant strains of fungus and the poor number of

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Bio active compounds, Antibacterial activity, Antifungal activity and anticancer activities of the leaf of *Vanda tessellata* Orchid epiphyte.

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Abstract

The presence of phytochemical constituents has been reported from species of the Orchidaceae. Hitherto no reports exist on the GC-MS profile of the leaves of *Vanda tessellata* Hook. Ex G. Don which was an epiphytic Orchid from the sacred grove of Penchalikona which was in the SPSR District (Nellore) of Andhra Pradesh. The current study was to determine the antibacterial, antifungal, anticancer activities and bio active compounds of the leaf of *Vanda tessellata* Hook. Ex G. Don. The leaf of the *Vanda tessellata* Hook. Ex G. Don from the sacred grove of Penchalikona of Andhra Pradesh. An *in vitro* evaluation of antibacterial and antifungal activity was performed by disc diffusion method and dilution technique, and anticancer activity was performed by SAB assay. Gas chromatography-mass spectrometry (GC-MS) analysis of the leaf extracts of *Vanda tessellata* Hook. Ex G. Don was performed on GC-MS equipment (GCMSQP2010, SHIMADZU). The GC-MS profile has shown the presence of different bioactive compounds in the leaf of *Vanda tessellata* Hook. Ex G. Don. A total of ten compounds were identified. Furthermore, the results of antibacterial and antifungal tests (both primary and secondary) shown that substantial antibiotic activity and the anticancer activity results are shown inactivity. From the results, it is evident that epiphytic leaf extracts of *Vanda tessellata* Hook. Ex G. Don has shown substantial antibacterial and antifungal activity and GC-MS profile revealed the 10 analytes confirming the leaf was a source of therapeutic compounds useful for the pharmaceutical applications.

Keywords: Epiphytes, Orchidaceae, Antimicrobial activity, ethyl acetate, Disc diffusion method, Dilution technique, SAB assay, GC-MS analysis.

Introduction

Epiphytes are great specialists having various morphological and physiological adaptations for their survival. Scientists concluded some important applications of genus *Vanda* in controlling fevers, curing eye diseases, treating fatigue, headaches and their function as anticancer agents [1]. Orchidaceae is the second-largest angiosperm family in India, consisting of about 990 Genera. Nine species of orchids used for medicine in south India [2].

Materials and Methods

This species was collected from the Penchalikona area. Penchalikona is located in Sri Potti Sri Ramulu district of Andhra Pradesh (Latitude 14° 18' N, Longitude 70° 28' E) 3000 ft (900m) above sea level. It is an epiphytic herb belongs to the family Orchidaceae (Fig-1).



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REVIEW

Acoustic and volumetric investigations in aromatic, cyclic and aliphatic ketones with dimethyl sulphoxide at 308.15 K

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Abstract Ultrasonic velocities, u , and densities, ρ , of binary liquid mixtures of dimethyl sulphoxide (DMSO) with ketones such as acetophenone (AP), cyclohexanone (CH), and 3-pentanone (3P), including pure liquids, over the entire composition range have been measured at 308.15 K. Using the experimental data, deviation in ultrasonic velocity, Δu , deviation in isentropic compressibility, Δk_s , excess molar volume, V_m^E , excess intermolecular free length, L_f^E and excess acoustic impedance, Z^E , partial molar volumes, $\bar{V}_{m,1}$, $\bar{V}_{m,2}$, and excess partial molar volumes, $\bar{V}_{m,1}^E$, $\bar{V}_{m,2}^E$ have been calculated. Molecular interactions in the systems have been studied in the light of variation of excess/deviation values of calculated properties and these properties have been fitted to Redlich–Kister type polynomial equation. The observed positive values of V_m^E , Δk_s , L_f^E and negative values of Δu , Z^E for all the binary liquid mixtures studied clearly indicate the presence of the dominance of weak physical interactions between the components of molecules. Further, FTIR spectra support the conclusions drawn from deviation/excess properties. Moreover, theoretical values of ultrasonic velocity in the mixtures have been evaluated using various theories and such values were compared with experimental velocities to verify the applicability of such theories to the systems investigated. © 2015 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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Binary mixtures of 2-methylcyclohexanone with various functional groups (m-cresol, p-cresol and o-chlorophenol)



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ABSTRACT

The densities, speeds of sound and viscosities including those of pure liquids, were measured for the binary mixtures of 2-methylcyclohexanone with various functional groups (m-cresol, p-cresol, and o-chlorophenol) over the entire composition range at different temperatures (303.15 - 318.15) K and atmospheric pressure 0.1MPa. Using this experimentally determined data, the values of excess molar volume, excess isentropic compressibility, partial molar volumes, partial molar isentropic compressibilities and deviation in viscosity of these components at infinite dilution were calculated. The results are discussed both in terms of acid-base interactions and the formation of π - π complexes between the, unlike molecules. Excess molar volume values have been analyzed with Prigogine-Flory-Patterson.

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Specifications Table

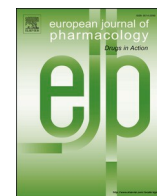
Subject area	Physical chemistry & Chemical Thermodynamics
Compounds	2-methylcyclohexanone, m-cresol, p-cresol and o-chlorophenol
Data category	Spectral synthesized
Data acquisition format	IR
Data type	Process and analysis
Procedure	Measurement of density, viscosity, and speed of sound of above-mentioned compounds, Estimate Partial molar volumes and Partial molar isentropic compressibilities.
Data accessibility	Data is provided with this article

1. Rationale

The Monumental features of Ionic Liquids (ILs) have a great plausible utilization in contemporary epoch. Remarkably, the thermo physical distinctive features of ILs at ambient temperatures play a juggernaut role in many sectors such as industrial engineering, pharmaceutical manufacturing and waste management treatment. Hydrogen bonding between molecules of an individual component or between molecules of different components of a mixture may be treated as an extreme case of dipolar

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Full length article

Computational and theoretical exploration for clinical suitability of Remdesivir drug to SARS-CoV-2

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ABSTRACT

A methodology for the exploration of clinical suitability of Remdesivir drug to SARS-CoV-2 main protease based on the computational, theoretical analysis pertinent to Gibb's free energy computed from the Molecular Dynamic simulations with OPLS-AA force field at 300 K/atmospheric pressure and the variation of thermodynamic potentials over the entire simulation run of 100 ns. This study emphasized the suitability of Remdesivir drug to SARS-CoV-2 protein and the same is emphasized by the results of global clinical trials. This methodology can be applied for future design, development of more specific repurposed inhibitors for the treatment of SARS-CoV-2 infection.

1. Introduction

Coronavirus disease (COVID-19) is an infection causing the severe acute respiratory syndrome. Coronavirus 2 (SARS-CoV-2), a recently revealed novel coronavirus is genetically different from viruses that trigger influenza. These are encased, single-stranded RNA viruses whose exterior is enclosed by a halo of protein spikes (corona). The SARS-CoV-2 fits in to the cysteine protease family and the fatality due to this has reached thousands and been mounting step by step, which is a major crisis in the world (Chen, 2020; Chen et al., 2020; Roberts et al., 2007). Since SARS-CoV-2 is rapidly spreading worldwide, World Health Organization (WHO) has declared it as a pandemic disease (Organization, 2020). Further, the devastation (de Wit et al., 2020; Xu et al., 2020) caused by this virus had raised high and critical interest to screen for expected medications through either sedate repurposing or novel medication advancement (Beck et al., 2020; Li and De Clercq, 2020; Lim et al., 2020; Novel, 2020; M. Wang et al., 2020). It is to be noted that the viruses need host-cell functional receptors in humans to accumulate and attack the immune system. As per the important studies (Cao et al., 2020; Gralinski and Menachery, 2020), the spike protein SARS-CoV-2 attacks the Angiotensin-converting enzyme 2 (ACE2) target protein on the surface of pulmonary epithelial cells of humans (Paraskevis et al.,

2020; Tipnis et al., 2000). Consequently, the challenge to search for medicines to prevent novel COVID-19 is of immense concern for all scientists around the globe. In this connection, Governments and pharmaceutical companies are paying much attention on probing and developing the unambiguous vaccine or antiviral drug to avert or manage budding infection of SARS-CoV-2. However, drug repurposing permits to quickly examine medical management, at lower costs and with diminished danger of disappointment as the wellbeing profile of the medication is commonly entrenched.

As of late, in view of its positive outcomes in clinical preliminaries, Remdesivir was affirmed by Food and Drug Administration to treat COVID-19 through emergency use authorization. With regards to Remdesivir, it is a monophosphoramidate prodrug of an adenosine simple that has an expansive antiviral range including filoviruses, paramyxoviruses, pneumoviruses, and coronaviruses (Gralinski and Menachery, 2020; Lo et al., 2017). In vitro, Remdesivir represses all human and creature corona viruses tried to date, including SARS-CoV-1 & 2, (MERS)-CoV and MERS infections (Brown et al., 2019; Sheahan et al., 2020, 2017; Warren et al., 2016). Furthermore, the inhibiting action of Remdesivir drug on Ebola (Chang et al., 2020; Warren et al., 2016) and on ACE2 is already proven (Zhang and Zhou, 2020). The principal prescription experience of the recuperated patients in the US

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Target SARS-CoV-2: theoretical exploration on clinical suitability of certain drugs

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ABSTRACT

We propose a unique theoretical methodology because of the global high priority rating to search for the repurposed drugs that outfit clinical suitability to SARS-CoV-2. The approach is based on the exploration of structural analysis, computation of biothermodynamics, interactions and the prediction of entropy sign successively via molecular dynamics. We tested this methodology for Favipiravir/Dolutegravir drugs on the apo form of SARS-CoV-2 main protease. This theoretical exploration not only suggested the presence of strong interactions between (SARS-CoV-2 + Favipiravir/Dolutegravir) but also emphasized the clinical suitability of Favipiravir over Dolutegravir to treat SARS-CoV-2 main protease. The supremacy of Favipiravir over Dolutegravir is well supported by the results of global clinical trials on SARS-CoV-2 infection. Thus, this work will pave the way for incremental advancement towards future design and development of more specific inhibitors to treat SARS-CoV-2 infection in humans.

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KEYWORDS

Apo form of SARS-CoV-2 main protease; Favipiravir; Dolutegravir; molecular dynamics; GROMACS; biothermodynamics; entropy; interactions

1. Introduction

In recent times, myriads of people have been suffering from a novel SARS-CoV-2 (COVID-19) infection, and the death rate toll has reached thousands and been heading step by step, which is a topmost crisis across the globe (Chen, 2020). Accordingly, the demand for an investigation of the drug to forestall SARS-CoV-2 is of enormous interest for all scientific communities worldwide. The vital topic appropriate to annihilating activity of SARS-CoV-2 virus is concomitant to a variety of viruses which caused MERS (Middle East respiratory syndrome), SARS (Severe acute respiratory syndrome) (Roberts et al., 2007). These viruses, which inception the common cold in human beings over and over again. However, the new COVID-19 cause earnest evidence compared to Middle East respiratory syndrome and severe acute respiratory syndrome (Chen, 2020).

SARS-CoV-2 is a betacoronavirus, such as SARS-CoV and MERS-CoV, all of which have their beginning in chiropterans. For the aesculapian indicant, SARS-CoV-2 pathologic process reason out in fatal pneumonia with the technological provision aggravated similar to SARS-CoV-2 malady. Endure infected with COVID-19 might likewise fortify acute respiratory distress syndrome, leading to a full admittance rate to an intensive care unit and finally death in austere cases (Chen et al., 2020).

The COVID-19 virus is suited to the cysteine protease family unit. Hitherto, various business firms and scholarly people followed a line of the probe on the globe paying care on inquisitory and processing the monosemous vaccine or

antiviral drug to obviate or pull off the budding pathological process of SARS-CoV-2. Conversely, such selections need much time for the developing procedure. For the imperative prerequisite to get rid of the SARS-CoV-2 virus, the use of repurposed on hand antiviral drugs is authorized to cure another viral contagion for example HIV, hepatitis B/C and influenza is to some degree anticipatory. It is based on the early action of healing after administration relevant to viruses of Middle East respiratory syndrome and severe acute respiratory syndrome (Clercq & Li, 2016; Huang et al., 2020; Liu & Wang, 2020).

As per the studies (Gralinski & Menachery, 2020; Paraskevis et al., 2020; Tipnis et al., 2000), the COVID-19 virus chooses Angiotensin-converting enzyme 2 (ACE2) of humans and from there, it gradually attacks the immune system. This enzyme is an integral casing of glycoprotein which lies in the essential issues of human beings. In this work, we used the Favipiravir/Dolutegravir drugs, which are crucial for the management of HIV. Further, the suppress activity of Favipiravir/Dolutegravir drugs on ACE2 is already proven (Tikellis & Thomas, 2012). In the present study, PDB6M03 pertinent to apo form of main protease apt to COVID-19 is the captivating drug prey for the remedy of COVID-19 pathologic process. As of late, given its positive outcomes in clinical preliminaries, Favipiravir was affirmed by the Food and Drug Administration to treat COVID-19 through emergency use authorization (Kandeel & Al-Nazawi, 2020). The structure and the source of the Protein/Drugs are shown in Table 1.

SARS-CoV-2 main protease (PDB6M03) as a drug target with certain drugs is available in the literature, but most of



Target SARS-CoV-2: computation of binding energies with drugs of dexamethasone/umifenovir by molecular dynamics using OPLS-AA force field

Sk. Md Nayeem¹ · Ershad Mohammed Sohail² · G. Ridhima³ · M. Srinivasa Reddy⁴

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Abstract

Introduction In recent times, myriads of public have been infected with a novel SARS-CoV-2, and the fatality toll has reached thousands and been mounting step by step, which is a major crisis in the world. The challenge for this burning issue pertinent to repurposed medicines which prevent novel coronavirus is of immense concern for all scientists around the globe until the arrival of the vaccine.

Methods Because of the global high priority rating on the search for the repurposed drugs which outfits clinical suitability to SARS-CoV-2, a unique theoretical methodology is proposed. The approach is based on explorations of biothermodynamics computed via molecular dynamics, root-mean-square deviation (RMSD), radius of gyration (Rg) and interactions. This unique methodology is tested for umifenovir/dexamethasone drugs on (SARS-CoV-2) main protease.

Results This theoretical exploration not only suggested the presence of strong interactions between (SARS-CoV-2 + umifenovir/dexamethasone) but also emphasized the clinical suitability of dexamethasone over umifenovir to treat SARS-CoV-2. This supremacy of dexamethasone is well supported by the results of global clinical trials and COVID-19 therapeutic approved management guidelines of countries.

Conclusions Thus, this work will pave a way for incremental advancement towards future design and development of more specific inhibitors for the treatment of SARS-CoV-2 infection in humans.

Keywords SARS-CoV-2 protein · Dexamethasone · Umifenovir · Molecular dynamics · Gromacs · Gibb's free energy · Interactions

Introduction

Coronavirus disease (COVID-19) is an infection causing the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a recently revealed novel coronavirus. SARS-CoV-2 is genetically different from viruses that trigger influenza.

These are encased, single-stranded RNA viruses whose exterior is enclosed by a halo of protein spikes (corona) (Fig. 1). The SARS-CoV-2 fits into the cysteine protease family, and the fatality due to this has reached thousands and been mounting step by step, which is a major crisis in the world (Chen 2020; Roberts et al. 2007; Chen et al. 2020). Since SARS-CoV-2 is rapidly spreading worldwide, the World Health Organization (WHO) has declared it as a pandemic disease (Coronavirus disease 2019). Consequently, the challenge to search for medicines to prevent novel coronavirus is of immense concern for all scientists around the globe.

Governments and pharmaceutical companies are paying attention to probing and developing the unambiguous vaccine or anti-viral drug to avert or manage budding infection of SARS-CoV-2. On the other hand, such selections need much time for the developing procedure. Drug repurposing permits to quickly examine medical management, at lower costs and with diminished danger of disappointment as the wellbeing profile of the medication is commonly entrenched. Growing

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Thermal Slip Flow of a Three-Dimensional Casson Fluid Embedded in a Porous Medium with Internal Heat Generation

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Present assessment is considered to analysis flow as well as heat characteristics of steady, thermal slip flow of three-dimensional Casson fluid embedded in a porous medium with internal heat generation. Geometry of the present analysis is linearly stretched surface. Later, all the PDEs corresponding to the study are altered to set of nonlinear equations ODEs by means of appropriate similarity transformations. An efficient numerical scheme of spectral relaxation method (SRM) is applied to solve the nonlinear ordinary system. Variations of Nusselt number, temperature, velocity, and local skin friction coefficient with fluid parameters exhibited by graphs and tables. Spectral relaxation method gives an exact convergence to the nonlinear boundary value problems compare with general methods. In this study, to improve the precision and accuracy of the SRM successive over-relaxation (SOR) strategy is utilized. Proposed method as well as outcomes is checked with the comparison. A sensible connection is acquired between the current outcomes and accessible outcomes in writing. Some of the observations are skin friction coefficient raises and velocities decreases by the magnetic field strength. Skin friction and Local Nusselt number at the surface is more pronounced for non-Newtonian case than that of Newtonian case.

KEYWORDS: Spectral Relaxation Method, Casson Fluid, Thermal Slip, MHD.

1. INTRODUCTION

Many researchers attracted to investigation the analysis of heat exchange of 3D boundary-layer flows over a continuously stretching as well as heated surface because of their notable applications in various fields like food stuff processing, chemical processing equipment, polymer processing, extrusion processes, fiber coating and heat exchangers design. To receive some knowledge about the process, heat transport and momentum analysis inside the fluid on a stretched surface is required. In early days, flow of boundary-layer through a continuous solid surface moving with a continuous velocity is considered by Sakiadis.¹ Thermal aspect of the issue was considered by Erickson et al.² as well as experimental verification was done by

Tsou et al.³ Later, this work¹ extended by Crane⁴ by considering the geometry of stretching plate.

Casson fluid is very important non-Newtonian fluid by its rheologic attributes.^{5–8} Some important points are reported by authors^{9,10} by considering the various geometries and various effects by taking the Casson fluid as working fluid. Dual solutions related to Casson flow over a shrinking or stretching sheet are found by Kameswaran et al.¹¹ and also initiate the nature of mass, heat exchange and skin friction by using Casson parameter. Heat transfer corresponding to flow of Casson fluid over a porous shrinking sheet together by means of the effect of viscous dissipation within boundary layer analyzed by Qasima and Noreen¹² and exhibited the existence of dual solutions. Convective conditions of Casson nanofluid flow with viscous dissipation analyzed by Hussain et al.¹³ and in their study they find out many observations out that one observation are that for Casson parameter effect temperature profile diminishes. It is seen that Casson fluid flow over

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An assessment of heavy metal concentrations in the fish fauna of Chippaleru Mangroves, South coastal Andhra Pradesh, India

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Abstract---The study has been carried out to assess the accumulation of heavy metals in the ichthyofauna of Chippaleru mangroves of south coastal AP, India. The water, sediment and fish tissue were collected at 3 locations. After the collection, the materials were washed with distilled water and they were dried and acid digested. Further the samples were subjected to analysis of heavy metals by flame atomic absorption spectrophotometer. Triplicate samples were analyzed. The levels of heavy metals, in water, were higher during monsoon and same is the case with sediment. The Cd concentrations in the liver of fishes: *Mugil cephalus* (0.99); *Chanos chanos* (0.81 and *Lates calcarifer* (0.11). The Milk fish accumulated more Hg (0.98) in its muscle than other fish.

Keywords---mangroves, fish fauna, heavy metal, *Mugil cephalus*

Introduction

One of the important groups of fauna that inhabit the precious mangrove ecosystems is fishes. The fishes are harvested from these pristine ecosystems also for human consumption. As fishes are known for valuable nutrients like biologically complete proteins and essential fatty acids that are beneficial for man through the view point of health and therapy (Castro-Gonzalez, 2002; Clarkson, 2002; Dominogo et al., 2007), the consumption of fish meat has been on constant rise. Particularly the sea-food which also includes the one from mangroves is the

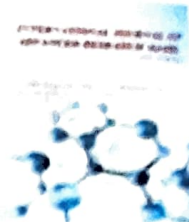


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RESEARCH ARTICLE

MARGINALIZED WOMEN IN GRAMA PANCHAYAT GOVERNANCE (AN EMPIRICAL STUDY ON ELECTED WOMEN REPRESENTATIVES IN PRAKASAM DISTRICT OF ANDHRA PRADESH)

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Key words:-

Grama Panchayat, Marginalized
 Women, Rural Governance,
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Abstract

An attempt is made to understand in a comparative perspective, the various dynamics involved in the functioning of marginalized women in panchayat raj in the context of reservations provided to these categories under 73rd Constitutional Amendment Act 1992. The reservation has been initiated in the country in the back-drop of illiteracy, male dominance, and caste predominance, deep-rooted cultural beliefs and values. The scholars in different studies pointed out that the reservation for marginalized women has not been made remarkable in roads in realizing the democratization of village governance. A large number of under-privileged women have been got elected to all tiers of PRI's through reservation. However, the quality of participation of women members in these PRI's is not satisfactory. Actually, how far they are effective in decision making are a pertinent question and how far the Schedule caste (SC) and Schedule Tribe (ST) women participate in the PRI's. The Study explored the role of reservation, awareness of Grama Panchayat, powers and functions and decision making with regard to the functions of S.C and S.T marginalized women panchayat members at grass roots grama panchayat governance. It also indicates pertinent observations regarding the limited and restricted political space given marginalized elected women in Grama panchayat politics. The present study is undertaken in the developed and under-developed mandals of prakasam district of Andhra Pradesh in India) elected women of disadvantaged groups from political local body of Grama Panchayat. Besides, it also suggests suitable measures towards policy formulation for ensuring effective participation of marginalized women.

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Introduction:-

SC and ST women constitute a lower segment in Indian society. The women are treated as a separate category and these are faced different problems as compared to other women in our society. The constitutional provisions of reservation for marginalized women in Panchayat Raj Institutions have given paradoxical results leading to structural implications. The presence of these deprived groups in the Panchayat system was resisted by traditionally dominates caste groups in the rural local bodies. The marginalized women are generally under poverty, agriculture laborers, economically poor, low education and social background, less influence on political power.

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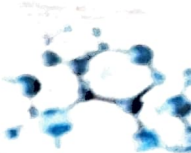
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RESEARCH ARTICLE

LEADERSHIP OF WOMEN THROUGH PANCHAYAT GOVERNANCE (A CASE STUDY OF ELECTED WOMEN REPRESENTATIVES OF PRAKASAM DISTRICT OF ANDHRA PRADESH)

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Manuscript Info

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Leadership, Rural Governance,
Awareness, Women Participation

Abstract

Women's participation in politics has been an issue of discussion in recent years. The dominance of caste, culture and patriarchy has resulted in ignorance among women about public life. The process of women's participation in local governance is in the transitory stage and needs to be carefully scurried to bring about an improvement in the better participation of women in rural politics. The leadership of women at grassroots democracy level still requires validation for effective participation. The goal of enlightening rural women will be achieved only if women are brought up to a level where they can participate in all walks of life. The goal of political equality can be achieved through women's involvement in the process of empowerment. The objective of this study is to examine the political status of women in the local institution of Grama Panchayat in the Prakasam district of Andhra Pradesh in India. 73rd Amendment of the Indian Constitution has been given a space to women to enable them to participate in the village development through grass root governance. It is seen in recent local body elections that the huge number of women is being elected to panchayat institutions. However, it is observed that lack of leadership is being created various types of problems while performing their legitimate roles in the public sphere. This paper deals the poor leadership faced by the women elected representatives from the coastal area of Prakasam district of Andhra Pradesh. The findings revealed that the political participation of women in the functioning and the electoral process of panchayats are not satisfactory at the grassroots democracy. A parochial society and low level of education are responsible for their inactive participation in the rural local democracy.

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Introduction:-

Women's leadership is crucial in the effective implementation of any development project. Majority of schemes and projects fail due to lack of women's involvement in its planning and implementation.

Gender discrimination is an ongoing debate worldwide. Women's participation in politics has been an issue of discussion in recent years. The dominance of caste, culture and patriarchy has resulted in ignorance among women

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