Impact of Information and Communication Technology (ICT) In the North East Region with Special Reference to Nagaland.

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Abstract - This paper is an attempt to analyse the impact of ICT in the North East Region particularly in the Nagaland state. The paper discussed on the historical entry of ICT in the region, establishments, problems, development and its impact. Looking at the present Naga context globalization and Information Technology had recently started developing unlike the other developed Indian states. Now, ICT being implemented in a Naga society, citizens are seen enjoying better health care, increased income and improved education. It is also found that ICT has enabled better access to government services; enhance communication both within and outside the state. However, there are several impediments in the implementations due to typical land structure, poor governance and weak infrastructure.

Keywords- development, globalisation, information, Nagaland, technology

DATA AND METHODOLOGY

The analysis uses primary information and data from the department of Information and Communication Technology, National Informatics Centre, Science and Technology Department and other related institutions, secondary sources from both published and unpublished works. The study covers the entire ICT sectors and institutes conducting field survey of four main districts of Nagaland, Kohima, the state capital, Dimapur, Mokokchung and Zunheboto.

INTRODUCTION

Information and Communication Technology (ICT's) have gained an unparalleled degree of attention in today's global modern society. Advances made in the last few decades have created a new method of instant communication and in turn given rise to power, wealth and profit making. With the onset of the 21st century, ICT has become an integral and a potent force in the social, economic and political spheres. Technologies have revolutionized the whole landscape of human life which marks the dawn of a new information society. The new network society generates new ways of producing, trading and communication. ICT have become a model for economic development both at the global and local levels. ICT's have transformed education, creating new possibilities for distance and community- based learning with life-long applications. Therefore, Information Technology has become a major engine of growth in many countries which secure linkages to international markets and global production networks as well. It has the potentials to enable closer interactions between and within the national borders for speedy global infrastructure. The present paper looks at how ICT is developing and aims to examine the rapid growth of ICT infrastructure in the state. It is an attempt to find out whether ICT is benefitting the state and whether it has brought any positive changes.

Contents

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An Economic Analysis of Micro and Small Manufacturing Enterprises in Nagaland

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ABSTRACT

Micro and Small manufacturing enterprises not only plays a critical role in providing employment opportunities at comparatively lower capital cost than large enterprises but also helps in rural industralisation and reduce regional disparities. This paper attempts to bring out an economic analysis of the manufacturing enterprises by studying the relationship between operating costs and the gross monthly income (GMI) and the mode of production. All the items of costs show a positive effect on GMI. The coefficient of determination or R^2 is 0.87 and that an increase by one unit will have a positive impact on GMI by 304649 times. Using the Cobb-Douglas production function the study also finds that manufacturing units are operating under decreasing returns to scale, labour ($ß_1$) and capital ($ß_2$) equals to 0.93 and that given the two inputs, the additional capital input will be preferred to labour input because output elasticity of capital is higher than the output elasticity of labour.

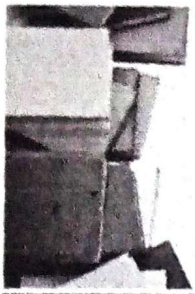
Keywords: Manufacturing, gross monthly income.

Manufacturing enterprises is one of the most vital sectors of an economy in ensuring equitable, inclusive and employment friendly economic growth. It contributes to economic development by creating employment opportunities for rural and urban population, providing goods and services at affordable costs by offering innovative solutions and sustainable development to the economy as a whole. The growth in manufacturing output is an important determinant of both productivity growth and gross domestic product growth (McCausland and Theodossiou, 2012). Manufacturing has been important for growth in developing countries because structural and infrastructural bases are essential for balanced growth and there is always a linkage among all the sectors of the economy. Manufacturing enterprises play a very crucial role in socio–economic development of an economy on account of their advantages like lower capital, employment generation, decentralization of industrial activity and utilization of locally available resources. Manufacturing enterprises constitute an important and crucial segment of the industrial sector in the economy and by contributing to the overall growth of the gross domestic product, employment generation and exports, the sector has emerged as the engine of growth for the economy.

In India as per micro, small and medium Enterprises Development Act 2006, manufacturing enterprises is defined as:

- A micro enterprise, where the investment in plant and machinery does not exceed twenty five lakh rupees.
- A small enterprise, where the investment in plant and machinery is more than twenty five lakh rupees but does not exceed five crore rupees.
- A medium enterprise, where the investment in plant and machinery is more than five crore rupees but does not exceed ten crore rupees.

The distribution of enterprises by nature of activity in the registered sector shows that in all the North eastern states of India, enterprises are highly



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History of Christian mission and their educational contributions in India-(15th -19th Century): An Overview

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Abstract
The presence of Christianity in India is aged almost two thousand years commencing from the arrival of St. Thomas, one of the Apostles of Jesus Christ and martyred in 72 A.D. in Chinnamalai, Mylapore Chennai. Since then Christianity spreads its roots in different parts of the country mainly in south India. Commenting on the contributions made by Christians Dr. Rajendra Prasad said on December 18, 1955, "Remember, St. Thomas came to India when many of the countries of Europe had not yet become Christians, and so those Indians who trace their Christianity to him have a long history and a higher ancestry than that of Christians of many of European countries. And it is really a matter of pride to us that it so happened". However, the early history of the Christian community is fables and traditions and only a few records exist. Their contributions are outstanding in the field of education and in preserving the culture of the people. They occupied a significant place to reach the country far through their trade and commerce.

Keywords: Christian, educational contributions, History

Introduction

India was invaded by the Aryans around 1500 BCE and merged with the earliest inhabitants to evolve classical Indian civilization. Jainism and Buddhism arose in the sixth and fifth centuries BCE. Apostle Thomas and some Jews came to India in 52 CE and spread the Gospel in South India. Also in the eighth century, the Arabs made inroads in India and established a Muslim foothold in western India. This was followed by different rulers and emperors one after another. Later came the Portuguese followed by the Dutch, the French, and the English after which the East India Company was established, and the British secured control of most part of India. Such was the background of India in the early period.

There are different famous views among scholars about the origin of Christianity in India. One is the Tradition of Apostle Thomas or St. Thomas Tradition. Another view may be mentioned here as St. Bartholomew Tradition. There is also a view related to the East Syrian or Persian churches. However, this paper will deal with the origins and beginnings of the Christian mission through the Tradition of St. Thomas. It further focuses on the Roman Catholic missions, their methods, and their contributions towards the spread of Christianity in India in Goa, Madura, Tuticorin, and the Mogul Court.

Origins of Indian Christians and the Tradition of St. Thomas

One of the Traditions about the tradition of Christianity in India is known as St. Bartholomew Tradition [1]. Bartholomew's tradition does not say specifically to which part of India Bartholomew and Pantaenus of Alexandria [2] went to propagate the Gospel. Another tradition is that speaking of the history of Christianity in India Dr. Rajendra Prasad, the then President of India said that St. Thomas came to India when many of the Europe countries had not yet become Christian. The Indians who trace their Christianity to St. Thomas have a long history and a higher ancestry than that of Christians in many European countries [3]. So this tradition said that Christianity in India is as old as Christianity itself. That is to say Christianity in India did not come initially from Europe [4].

Contributions To the Rise of Indian Nationalism: Qualitative Analyses

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Abstract:

Indian Nationalist Movement is known to be the greatest freedom movement against colonial power in the history of the world. However, today's generation tends to forget the immense contribution of our freedom fighters who liberated India, from the British yoke. India, was never, politically united. It was the same, since the Aryan invasion. India was under British colonial rule for around 200 years until its independence in 1947. Even before colonization, Indians were divided into lines of caste, creed, and religion. There was no national consciousness, no unity among them, and different rulers were fighting against each other for territorial gain and other interests. However, with the arrival of the British East India Company, and its policies of colonization being implemented, the British East India Company became the subject and its policies the tool for the birth of Indian Nationalism. Under British colonial rule, India was controlled in every sphere of life - political, social, economic, and cultural. In one way, the rule of the British was a curse to Indians, but, on the other hand, it was a way of uniting the Indians. Besides, some nationalists are forgotten in today's India, while others are highlighted as national heroes. So, the current study has been formed to bring to light those unsung heroes and their contribution toward free India.

Keywords: British, Imperialist, Nationalism, and Colonization.

Objective: The study aims to re-read the rise of the Indian Nationalist Movement, remember India's freedom fighters and their sacrifices, and acknowledge their immense contribution to the freedom of our country, India.

Methodology: The current study is an analytical method of re-reading Indian Nationalism and its contributions from the Post-Colonial India perspective.

Introduction

In fact, before the advent of the British East India Company in India, a nationalist consciousness did not prevail in the country. The nation as a whole was socially and politically not united, the North and the South were not going along in their love for the country. Division flourished among people on caste, race, region, and religion – barriers to national unity. However, the BEIC eventually brought into creating an elite middle class through western education. This group of western educated Indians realized the need for national unity, thus, contributing to the awakening of the masses in various parts of the country. Perhaps the Revolt of 1857 was a watershed moment in time, but sadly, it was confined to a small region, a small group of Indians, and unorganized (Campbell, 1987). However, the Revolt of 1857, no doubt, generated the rise of nationalism under efficient and robust national leaders culminating in India to her independence in 1947.

The rise of Nationalism in India

During the Industrial Revolution of the 16th and 17th centuries, also known as "Early Imperialism", the Europeans began exploring other parts of the world for trade and commerce. They came to South Asia, particularly to India, led by the Portuguese, through the exploration voyage of Vasco-da-Gama in 1498, and later on joined by the Dutch, the English, and the French. The BEIC evolved from a small enterprise (City of London Merchants), which is 1600 was granted a royal charter conferring the monopoly of English trade in Asia and the Pacific. Although technically independent from the British Crown, the BEIC became the primary agent for British imperialism throughout Asia, thus, raising its private army. The Battle of Plassey was fought in 1757 between the BEIC and the native Bengal Raja. Later, in 1764, the Battle of Buxar was fought between the BEIC and the triple alliance of the Nawab of Bengal, the Nawab of Awadh, and the Mughal Emperor Shah Alam II (Agarwal, 1968). In both battles, the BEIC became victorious, which finally ignited the BEIC agenda of colonization of the larger part of India.

Initially, the BEIC was a small, insignificant trading company interested in products like cotton, silk, indigo dye, sugar, spices, saltpeter, etc., and was primarily engaged in the buying and sale of products. By 1850, the BEIC had controlled almost the entire India, politically and economically, and discontentment had become the order of the day among the Indians. In 1857, the first Indian uprising against British rule led to a significant event, "The Revolt of 1857." However, the rebellion was suppressed and the British government completely made India part of its empire in 1858 (Jayapalan, 2001). The distrust of the administration of the British, the economic exploitation, and the introduction of policies relating to their superior complexity over the Indians, affected adversely all classes of people. The BEIC put an end to the old social order of the Indians, which was imperialist in its nature of reform. However, it was British Imperialism that gave birth to the idea of unification among the Indians, which enabled them to think as one nation. This unification led to the identification of the objective of freedom from British rule (The Age of Imperialism, 2001). According to Professor Moon, "British imperialism in India gave her a political unity under a third party despite the many discordant elements in Indian society." Perhaps, the Revolt of 1857 contributed a major role in uniting people, and imbibing the idea of nationalism in them. "The Nationalism at the time of the Mutiny of 1857 was not an organized force. But the year 1857 represents the watershed from where new forces were generated, which culminated in the rise of the organized national movement under the leadership of the Indian National Congress" (Agarwal, 1968). Thus, the idea of fighting back against the colonizer for a free India was born among the Indians.

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On the Making of Marriage and the Thought of Death: A Study of the themes of Life, Marriage, Death and After Life from Selected Poems of Naga Poets

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Abstract: *Culture is a summation of life and the substance after life. The Naga society is one such closely knitted community where customs and traditions managed the folk life and influenced the society in its habits, rituals and beliefs. Considering the importance of population in the making of a society or a community, marriage and its force play an important role for procreation and regeneration of life. Society with its condition in the form of hierarchy, familial relationship and communal mood of war and friendship plays a vital role in matrimonial affairs of the people which is reflected in this paper. On the theme of the afterlife, the concept of reincarnation and metamorphosis merged with oral beliefs and superstitions come together in supplementing animism and its nature-oriented belief. This paper brings two varied themes; on the making of marriage and on the idea of death which may seem distant from each other but are two of the most important events in a persons life and in a society.*

Keywords: *culture, social stratification, afterlife, reincarnation, metamorphosis*

Culture is a reflection of its people and with all the trivial and mundane things that filterout to be significant for the reason it is performed and in the process of which it becomes tradition, a necessity. The theme here is on the observation of human relationship; of birth, of life, of love, of wooing, of marriage, of death, in short, of reality. But after death and the end of a life comes the concept of afterlife which is

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Research Paper

Effect of Chemical reaction on an MHD heat and mass transfer flow with special reference to Homotopy Perturbation Method

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Abstract: *MHD boundary layer flow over a moving vertical plate with magnetic field and Chemical reaction in presence of heat and mass transfer has been planned. Using He's Homotopy Perturbation Method (HPM), the system of non-linear ordinary differential equations governing the MHD boundary layer equations is solved. The influence of a variety of significant physical parameters on the boundary layer flow is illustrated graphically with the physical interpretation. The obtained results point to the efficiency and convenience of the HPM. Utility of this model has been perceived in diverse industrial and chemical processes.*
Keywords: *MHD; Heat Transfer; Mass Transfer; HPM, Chemical reaction.*
2010 AMS subject classification: *76W05*

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I. Introduction

Magnetohydrodynamics *(MHD)* concerns with the study of fluids under electro-magnetic effects. Now-a-days applications of MHD principles obtain great importance because of its wide ranging utilities in various fields such as geophysics, astronomical science, space science etc. Because of importance of MHD principle in different field, many researchers give their attentions to do work in the field of MHD. Investigation of MHD boundary layer flow with heat and mass transfer has momentous applications in the fields of aeronautical plasma flows, nuclear reactor, magnetosphere, chemical engineering and electronics. Most of chemical engineering progression like polymer extrusion processes and metallurgical involves cooling of a molten liquid. To improve the quality of the eventual creation, Balla and Naikoti (2015), Islam and Ahmed (2017), Prasad and Reddy (2019) etc. have made astounding contributions in solving various flow problems of assorted geometries.

Due to importance of chemically reactive fluids, several researchers have carried out their studies on the problems of flow under heat and mass transmission. Some of them are Muthucumarswamy (2002), Muthucumarswamy and Meenakshisundaram (2006), Mahapatra *et al.* (2010), Mythreye *et al.* (2015), Mythreye and Balamurugaon (2017), Nisar *et al.* (2021), Haq *et al.* (2021) etc

In this paper, the influence of chemical reaction is adopted to generalize the work of Sarma et. al. (2020). In the process of generalization, almost exact results are drawn which is shown by virtue of comparison graph with the work of Sarma et. al. (2020)

Mathematical Formulation

The present study contemplates an MHD boundary layer flow over a moving vertical plate with heat and mass transfer of viscous in presence of magnetic field. The flow is supposed to be in x-axis which is along the direction of plate and y −axis is taken normal to it. Let u and v be the x −component of fluid velocity and y-component of fluid velocity respectively. The flow formation which describes the physical insight of the problem is given by

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Influence of Chemical Reaction and Magnetic Parameter over a Non-Linear Stretching Sheet with the Special Impact of Homotopy Perturbation Method

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ABSTRACT

Present study explores the non-linear flow of viscous incompressible fluid with chemical reaction and stretching parameters with reexploration/absorption. An analytical solution for the system of non-linear momentum, energy, and concentration equations is risked by adopting Homotopy Perturbation method (HPM). The influence of chemical reaction par parameter stretching parameter, Magnetic parameter on both the flow and heat and mass transfer are presented and discparametersphically.

Key Words: Parameters and motopy Peparametersn method, Stretching Sheet, Stagnation point, Chemical reaction.
2010 AMS subject classification: 76W05

1. INTRODUCTION

Magnetohydrodynamics *(MHD)* concerns the study of fluids under electromagnetic effects. Nowadays applications of MHD principles obtain great importance because of their wide-ranging utility in various fields such as geophysics, astronomical science, space science, etc. MHD principles have got applications in biomedical engineering like magnetic drug targeting, magnetic devices for cell separation, cancer tumors treatment, magnetic endoscopy, cell death by hyperthermia etc. Because of importance of MHD principle in different field, many researchers give their atattention to do work in the field of MHD. Significant contribution in the MHD field was given by Alfven (1942). After the works of Alfven, several researchers were doing many good works in the MHD field. The name of some of them are Sarada and Shankar (2013), Ahmed and Sinha (2014), Abbas et al. (2020), Bera (2020), Manzoor et al. (2021) etc.

Several researchers have examined reaction- induced impact resulting from flows involving transfer of mass and heat, of those Apelblat (1982) and Anderson *et. al* (1994) are considered important. Chambre and Young (1958) studied chemical reaction of primary order in nearest of plate oriented horizontally. Muthucumarswamy (2002) conferred effects of heat and mass transfer considering homogeneous 1^{st} order reaction on endlessly moving surface of isothermal condition with uniformly occurring suction. Muthucumarswamy and Meenakshisundaram (2006) analyzed analytically the influence of chemical reaction on erect oscillatory plate.

Studies on *MHD* induced fluid moving on non-linear stretching sheet recently assumes great significance and importance because of their wide ranging applications in the process relating to technology and industry. Importance of these phenomena is so increasing that quite a good number researchers are contributing their research works in this field. Some notable researchers are Jhankal, A. K. (2014), Makinde, O. D. (2010), Sinha S., Sarma M. K. (2020), Kechil and Hashim (2008), Eardunbuhe (2012), Kai *et al.* (2019), Ekang *et al.*(2021) etc.

In this paper, Homotopy Perturbation Method (HPM) is adopted to generalize the work of Borgohain et.al. (2022) by imposing the effect of chemical reaction. In the process of generalization, almost exact results are drawn which is shown by virtue of comparison graph with the work of Borgohain et.al. (2022)

2. MATHEMATICAL FORMULATION OF THE PROBLEM

Let us consider the steady two dimensional stagnation point flow of an electrically conducting viscous incompressible fluid near a stagnation point O, at the surface which is considered along the plane y = 0 (x-axis). The substantial circumstances

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N'-(3,4-dimethoxybenzylidene)-4-methylbenzenesulfonohydrazide derivatives: Synthesis, quantum chemical method, in silico ADMET, molecular docking and molecular dynamic simulations

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ABSTRACT

A new N'-(3,4-dimethoxybenzylidene)-4-methylbenzenesulfonohydrazide derivatives were prepared from a condensation reaction between 4-methylbenzenesulfonohydrazide and 3,4-dimethoxybenzaldehyde. The structure of **DMSH** was elucidated using various spectral techniques including FT-IR, ^{1}HNMR and ^{13}CNMR. The structure of **DMSH** bond parameters also confirmed by single crystal XRD analysis of related derivatives and optimized bond parameters are calculated by density functional theory (DFT) method at B3LYP/6–311 G (d, p) level of theory. The optimized geometrical parameters obtained by DFT calculation are in good agreement with single crystal XRD data. The experimentally observed FT-IR bands were assigned to different normal modes of the molecule. The results show a good agreement with each other when these computed bond parameters are compared to XRD values of related compounds. The stability, chemical reactivity and charge transfer within the molecule was explained by frontier molecular orbital calculations. Atomic charges on the various atoms of **DMSH** obtained by Mulliken population analysis. Potential reactive sites of the **DMSH** compound have been identified by MEP which is mapped to the electron density surfaces. The reported molecule is used as a potential NLO material since it has a high μ/μ_0 value. The theoretical UV–vis spectrum of the compound is used to study the visible absorption maxima (λ max). The molecular docking mechanism between **DMSH** ligand and COVID-19/6WCF and COVID-19/6Y84 receptors were studied to investigate the binding modes of this compound at the active sites. Molecular docking outcomes have shown that the **DMSH** molecule can be considered as a potential agent against COVID-19/6WCF-6Y84 receptors. In addition, the theoretical parameters of the bioactive molecules were calculated to establish their drug-likeness qualities and ADME/T analysis was carried out to examine the drug properties of the synthesized compound. Molecular dynamics simulation was performed for COVID-19 main protease (Mpro: 6WCF/6Y84) to understand the elements governing the inhibitory effect and the stability of interaction under dynamic conditions. The resultant complex structures were subjected to 100 ns simulation run to estimate their binding stabilities using GROMACS. The molecular dynamics simulation studies provided essential evidence that the systems were stable during the progression of 100 ns simulation run.

1. Introduction

Older patients with COVID-19 have concomitant conditions like diabetes, hypertension, obesity, and chronic renal disease [1,2]. Effective medicines for treating the novel corona virus illness's long-term consequences (COVID-19) still aren't available despite notable advancements in disease treatment techniques. It has now been discovered that COVID-19 affects more than just the respiratory system [3]. The search for the suitable vaccines and efficient medications continues in the interim. We were inspired to create a new bioactive chemical of hydrazine derivatives termed hydrazone since several antiviral medications, like Merimepodib, Remdesivir, and Mozenavir [4], are rich in nitrogen atoms and aromatic rings. In medicinal and combinatorial chemistry, hydrazone production, which is characterized by the development of an R1R2Cdouble bond and single bond NH2 link, stands out as a promising technique for intermolecular conjugation due to its reaction efficiency and product stability [5,6]. Generally speaking, hydrazones are a unique class of Schiff bases that are bonded to an

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RESEARCH ARTICLE

Synthesis, quantum chemical studies, molecular docking, molecular dynamics simulation and ADMET studies on 2-(2,3-dihydrobenzo[b][1,4]dioxin-6-yl)-1, 4,5-triphenyl-1*H*-imidazole derivatives

Solo Lorin[a], D. Rajaraman[b], S. Sonadevi[b], R. Jaganathan[c], P. Kumaradhas[c], L. Athishu Anthony[a], K. Nagarajan[d] and K. Raja [a]

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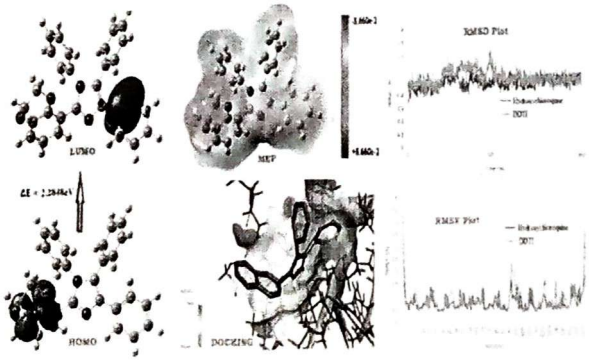
Imidazole; DFT; molecular docking; molecular dynamic simulations; ADMET

ABSTRACT

A novel 2-(2,3-dihydrobenzo[b][1,4]dioxin-6-yl)-1,4,5-triphenyl-*1H*-imidazole **(DDTI)** molecule was synthesised and characterised by FT-IR and NMR (^{1}H and ^{13}C) spectral techniques. The molecular structure was optimised using the density functional theory (DFT) method with B3LYP/6-311 G (d, p) basis set. Natural bonding orbital (NBO) analysis was used to determine the electron densities of donor (i) and acceptor (j) bonds as well as the hyperconjugative interaction energy ($E^{(2)}$). In highest occupied molecular orbital (HOMO) and lowest unoccupied molecular orbital (LUMO) calculations, the smaller energy gap value was discovered. Molecular electrostatic potential has been analysed. The Mulliken atomic charges of the carbon, nitrogen and oxygen atoms were calculated at the same level of theory. The dipole moment, polarizability and first-order hyperpolarizability demonstrate the good nonlinear optical (NLO) feature of the title molecule. Molecular docking studies are implemented to analyse the binding energy of the **DDTI** compound against standard drugs such as the crystal structure of ADP ribose phosphatase of NSP3 from SARS-CoV-2 in complex with MES, SARS-CoV-2 main protease with an unliganded active site (2019-nCoV, corona virus disease 2019, COVID-19) and the crystal structure of COVID-19 main protease in complex with an inhibitor N3 found to be considered having better antiviral agent. Molecular dynamics simulation was performed for COVID-19 main protease (Mpro: 6WCF/6Y84/6LU7) to understand the elements governing the inhibitory effect and the stability of interactions under dynamic conditions. Virtual ADMET studies were carried out as well and a relationship between biological, electronic and physicochemical qualifications of the target compound was determined. Toxicity prediction by computational technique for the title compound was also carried out.



1. Introduction

Multicomponent reactions (is a chemical reaction where three or more compounds react to form a single product.) have become a powerful tool in modern chemical synthesis of organic chemistry to produce a single synthetic product from complicated organic compounds.

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The relationship between history and other branches of social sciences

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Abstract
History is the study of the past - specifically the people, societies, events, and problems of the past as well as our attempts to understand them. History furnishes sufficient material for comparison and induction, enabling us to build an ideal political structure of our aspirations. History apart from being a source of precedent and prediction is also a bridge to other disciplines in order to fully grasp the understanding of other humanities and the sciences. Marwick (1989) speaks of history as a 'social necessity' it means history provides a critique of the myths that pervade society. It has a crucial corrective function in that by removing myths, it can act as the conscience of society. The report on history is concerned mainly with those persons inside, but also outside, the historical profession who are engaged in the historical work of a social science character, and with that part of historical study and training that falls within the scope of social science. This focus has no invidious implications. On the contrary, the diversity of historical work reflects the diversity of the historian's interests and of the evidence available to him; this diversity is a valuable, even indispensable, feature of the discipline.
Method and Objectives: The aim of the paper is to present how history provides an imaginative range apart from being an inventory of assets. The current study is a critical analysis of the secondary sources, followed by a semi-structured interview.

Keywords: Historian, scientific inquiry, education, behavior, judgments, and humanistic though

Introduction
The major aim of education is the unification of knowledge existing in different branches of learning. To achieve such a unification a conscious effort has to be made by teachers teaching various subjects. It is only by such a joint venture that we will be able to achieve the goal of unification of knowledge and bridge the gap that separates them. History provides material, inspiration, and background of contemporary events and conditions to literary persons. In its turn, literature throws light on popular taste, moral and intellectual standards, prejudices, ideas, and inspirations of a nation. Political science has a close affinity with history for it studies political theories and institutions. Knowledge of history is essential for the proper understanding of the evolution of political institutions. Although the two disciplines are interrelated, there are certain dissimilarities. History helps mathematics to know about various mathematicians who were pioneers in their field and enriched mathematics through their contributions. History also provides information about the origin and development of mathematics. Mathematics helps history in regards to the calculation of dates and days etc. of various historical events. In teaching history we provide opportunities for the students for discussing speak, debating, and paper reading as also as narrating their experiences in black and white. Thus, we find a sort of correlation existing between history and language.

Defining History and Social Sciences
History is the study of man's past. Or in another word, it is the study of events in man's struggle for progress. It can also be said that history is humanistic. It is fundamentally concerned with human actions and when other things are mentioned, they are generally incidental or relative. What is important in history is events, and the assumption has nothing to do with them, as it is not concerned with things that did not happen. History is concerned with change. The historian is primarily interested in changing life's political, social, economic, artistic, philosophical, and scientific aspects. History is time and place oriented. History is scientific. Historical writing is based not only on the inquiry into evidence of events but also on a rational analysis of data. History is an independent branch of study. It is self-explanatory, for it exists on its own, reflecting upon the human experiences in the past and promoting a better understanding of the present [1]. History, as a branch of knowledge, has developed its own concepts and

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Traditional techniques of search, finding, rear, and harvest of Asian giant hornet (Vespa mandarinia Smith) and its socio-economic perspective on Phek district of Nagaland, Northeast, India.

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Abstract:
The Asian giant hornet *(Vespa mandarinia Smith)*, also called *"khude"* in the local tongue of *chokri* speaking people of Phek district, Nagaland, is widely reared in its traditional method in almost all villages and towns during the months of May to October every year. This annual proceeding is pursued by both the town and village dwellers for the purpose of economy and consumption in the near future. It is found beneath the surface of the earth in the forest region. The Asian giant hornet is first engaged from sap-giving trees (*usually the oak trees- a tree of the genus Quercus, abound in the district*) which produce healthy sap in the months of the Spring season. Here, the Asian giant hornet is located, collected, and is relocated to a new rearing site. Although the sting of the Asian giant hornet is quite unpleasant and deadly, it does not devalue people's interest in finding and rearing it. Neither, do people wear modern safety gear while harvesting the hive. The Asian giant hornet is one of the highly sought varieties of edible insects found in the Phek district of Nagaland. In the district, rearing of the Asian giant hornet with nil capital input has become mini-industry a thriving mini-industry and a source of income to a small section of the community, and moreover, a food delicacy to both the young write-up old. Thus, this write-up thoroughly deals with a detailed process of finding traditional search, find, collect, consuming, rear, harvesting, consuming, and selling of the Asian giant hornet in this part of Nagaland.

Keywords: Asian giant hornet, traditional, working hornets, metamorphose, search, find, rear, socio-economic, comb, hive, rearing-pit, forage, feed, Phek district of Nagaland.

Method: The current research employed a field-based ethnographic research method and a semi-structured oral interview was conducted with experienced folk related to the search, find, and rearing of the Asian giant hornet.

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The Consequence of Thermal Diffusion on an MHD Flow with Free Convection Past an Upright Plate in Connection with Ramped Wall Temperature and Concentration

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Abstract: ***The present study attempts to investigate the influence of thermal diffusion with a special reference to ramped wall temperature and concentration in an unsteady MHD heat and mass transfer flow are studied parametrically. The MHD boundary layer equations are solved by adopting Laplace Transform technique. The impact of many relevant physical parameters is graphically illustrated and discussed.***

Keywords: MHD, Thermal diffusion, Schmdit number, Laplace Transform Technique

1. Introduction

Many natural phenomena and engineering issues are prone to MHD analysis. Geophysics encounters MHD characteristics within the interaction of conducting and magnetic fields. MHD is that the science of motion of electrically conducting fluid in presence of magnetic field. There are varied samples of application of MHD principles, as well as MHD generators, MHD pumps and MHD flow meters etc. The generator and motor could be a classical example of MHD principle. MHD principles additionally notice its application in drugs and biology. Model studies on MHD free and forced made convection with heat and mass transfer issues are applied by several authors because of their application in several branches of science and technology. a number of them are Ahmed [1], Elbashbeshy [2] and Singh and Singh [3]. Gregantopoulos et al. [4] studied two-dimensional unsteady free convection Associate in mass transfer flow of incompressible viscous dissipative and electrically conducting fluid past an infinite vertical porous plate. Several investigators have studied the impact of reaction in several convective heat and mass transfer flows of whom Apelblat [5] and Anderson *et.al* [6] are price mentioning.

The instability of mass-produced by a change in temperature defines the Soret Effect. Charles Soret in 1879, was the first scientist who executed the investigational study of this effect on mass transfer associated problems and that is why the effect was named after the scientist as a tribute of respect for his work. Uwanta et al. [7] examined MHD fluid flow over a vertical plate with Soret and Dufour effects. Reddy et al. [8] analyzed viscous dissipation, Soret and Dufour effects on free convection flow from a porous vertical surface. Reddy [9] examined the effects of Soret and Dufour on free convective MHD flow over a vertical porous plate provided heat generation present.

In this research, Laplace Transform technique is developed to solve the governing equations. The major goal of this work is to use the above mentioned method to explore the effects of thermal diffusion on MHD fluid flow. The basic idea of the present work is developed by considering the influence of thermal diffusion as the generalization of the work of Mahanta M and Sinha S [10].

2. Mathematical formulation of the problem

The objective of present study is to investigate the influence of thermal diffusion with a special reference to ramped wall temperature and concentration in an unsteady MHD heat and mass transfer flow. A co-ordinate system is introduced, where X-axis is considered along vertical direction of the wall and Y-axis is considered along the normal to the wall as shown **in Figure 1**.

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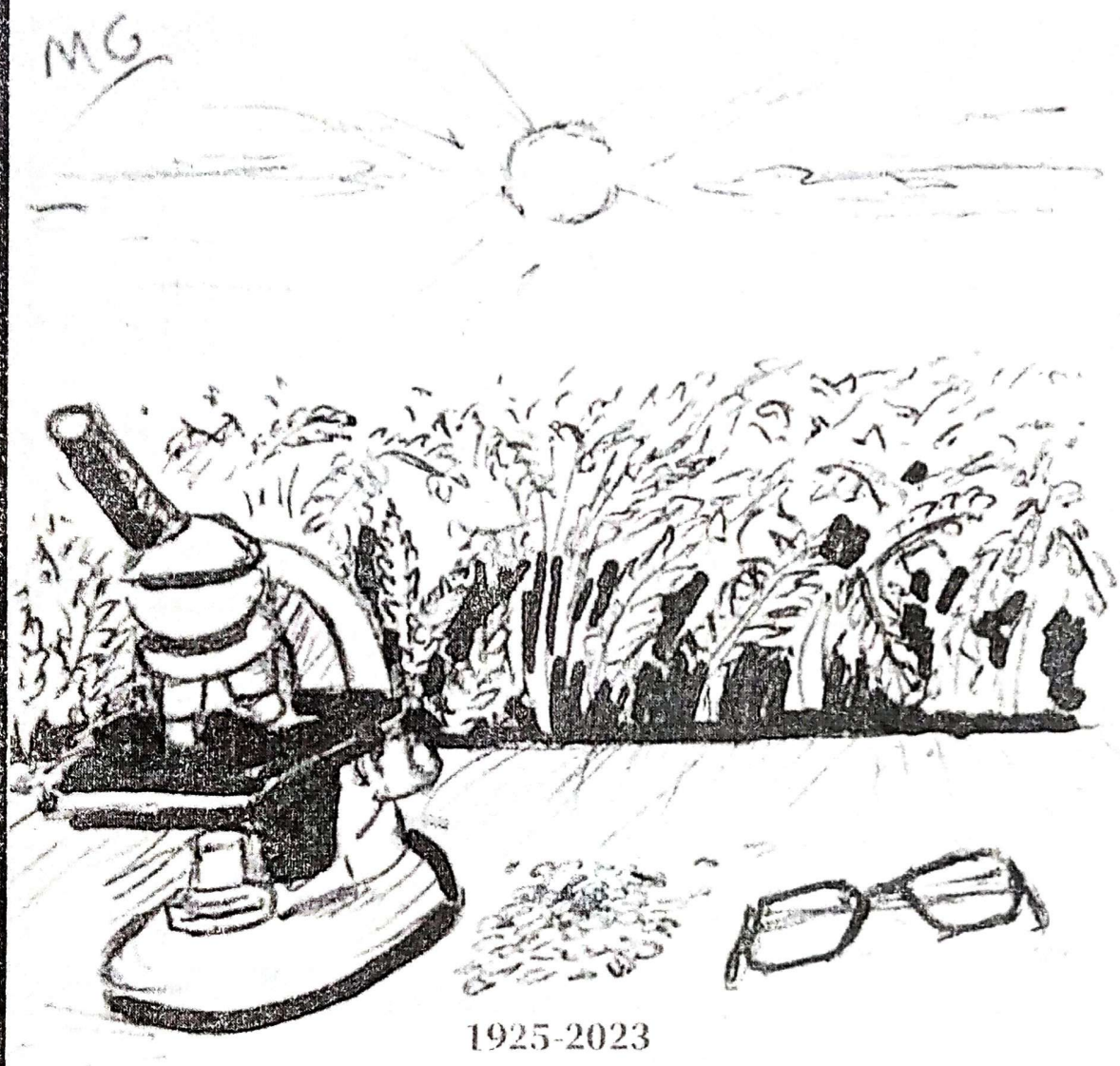
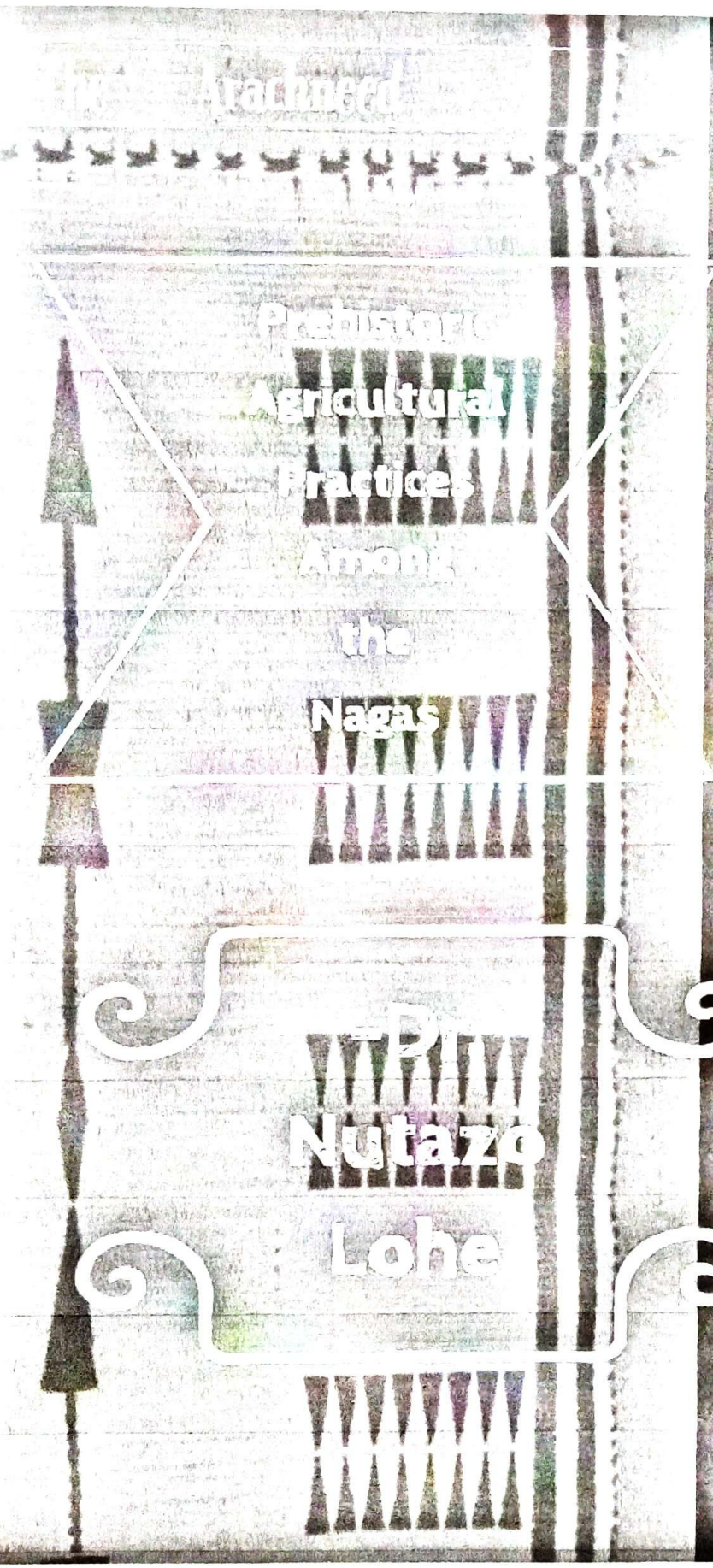
The Arachneed

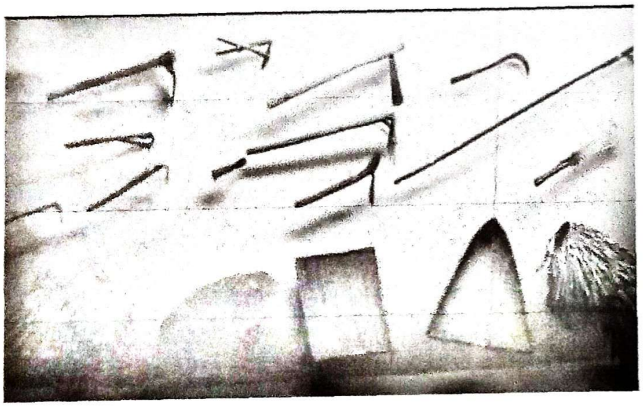




"THE STATE OF NAGALAND IS ONE AMONG THE EIGHT NORTH- EASTERN STATES OF INDIA BOUNDED BY ASSAM IN THE WEST, MYANMAR ON THE EAST, MANIPUR IN THE SOUTH AND ARUNACHAL PRADESH IN THE NORTH. THE AGRICULTURAL PRACTICES OF THE NAGA PEOPLE IN NAGALAND HAVE A LONG HISTORY DATING BACK TO PREHISTORIC TIMES. PREHISTORIC NAGA AGRICULTURAL PRACTICES WERE BASED ON INDIGENOUS KNOWLEDGE AND ADAPTED TO THE LOCAL ENVIRONMENT. NAGAS HAD AN INTRICATE UNDERSTANDING OF THE ECOSYSTEM AND SEASONAL CHANGES."

The Arachneed

The history of agriculture in Nagaland is a complex and rich one, deeply intertwined with the culture, traditions, and ecological diversity of the region. Agriculture in Nagaland has evolved over centuries, with various influences shaping its development. The Naga tribes have traditionally practiced shifting or slash-and-burn cultivation, locally known as "jhum" cultivation. This involves clearing a patch of forest, burning the vegetation, and then planting crops in the ash-enriched soil. After a few years, they move to a new plot, allowing the old one to regenerate naturally. Shifting or jhum cultivation is a primitive form of agricultural practice characterised by rotation of fields from one place to another in the form of mixed cropping cultivation. Jhum cultivation which is considered as a primitive mode of subsistence living continues to be seen till today among the Nagas. The stages of works employed in the process of carrying out this occupation continue to remain the same except with some changes of modern agricultural implements.



Agriculture among the Nagas has deep cultural and social significance. Many of the Nagas festivals and rituals are closely tied to agricultural activities. Nagas cultivate a variety of crops, including rice, maize, millets, yams, and vegetables. Rice is a staple food, and different Naga tribes may have their unique varieties. Modernization and development have influenced Naga agricultural practices, with some tribes adopting more sustainable and contemporary farming techniques.

However, traditional practices like jhum cultivation still persist today in some areas of Nagaland.

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Comparative Assessment of Soil Chemical Properties in Upper and Lower Forest Zones of Zanübu Mountain Range of Phek District, Nagaland, India

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Abstract: The present study was conducted in Zanübu mountain range of Phek district, Nagaland, India, to estimate the variability of soil chemical properties at two forest zones i.e., 2000-2426m amsl (Zone-I, the undisturbed forest) and 1600-2000m amsl (Zone-II, which is disturbed by human activities such as hunting, logging, grazing, collection of wild edible resources, jhum cultivation, and cardamom plantation). Soil samples were collected at different depths and soil chemical properties such as organic carbon, available nitrogen, available phosphorus, exchangeable potassium and pH were analysed using standard procedures. The organic carbon, available nitrogen and available phosphorus were higher in Zone-I (undisturbed forest) as compared to Zone-II (disturbed forest). The factors responsible for the variability of the soil nutrients were altitude, different land use system and anthropogenic disturbances. Exchangeable potassium had significant positive correlation with organic carbon in Zone -I and negative with phosphorus in Zone-II. A negative correlation was observed between exchangeable potassium and pH in both the two zones. If the trend of anthropogenic activities continues in zone-II, it will affect restoration process of soil.

Keywords: Soil chemical properties, Zanübu mountain range, Phek district, Undisturbed forest, Disturbed forest

Formation of soil is influenced by various factors such as parent material, relief, climate, organisms and time. Since the wide meteorological variation results in different climatic zones, soils also differ according to these variations (Poji et al 2017). Altitude plays a significant role in changing the climatic characteristics, soil properties and land use patterns (Deb et al 2019). Knowledge about the vertical distribution of soil nutrients under various forest soils help to understand the biogeochemical cycles (Yang et al 2010). The knowledge of chemical and physical properties of soils has always helped foresters to assess capacity of sites to support productive forests (Schoenholtz et al 2000). Himalayan forests play an important role in moderating the severity of the climate, in cooling and purifying the atmosphere, in protecting and conserving the soil, in holding the hill slopes in position and in cushioning up huge reserves of soil nutrients (Sharma et al 2010). Eastern Himalaya, one of the biodiversity hotspot of the world is a fragile region due to frequent land-use transformation through deforestation, land degradation, and disruption of the hydrological cycle (Tiwari 2008) and these forests, in general, are under high anthropogenic pressure due to excessive extraction of biomass in the form of fuel wood and fodder (Malik et al 2014, Singh et al 2017, Haq et al 2019a, 2019b). Himalayas have high variation in the landscape and hence, the bioclimatic conditions change rapidly within a very short distance resulting in different soil properties and types (Baumler 2015). Soil degradation process is influenced by land management, as well as by topographic factors such as altitude (Mishra and Francaviglia 2021). Zanübu mountain range is a community conserved forest conserved by seven surrounding Chakhesang villages. In the recent past, rapid land use change has occurred especially in the lower altitude caused by deforestation of natural forests for shifting agriculture, plantations and logging which has led to increase of soil erosion. Therefore, the present study aims to compare the soil chemical characteristics between the upper zone which is undisturbed forest and the lower zone forest which is disturbed by different anthropogenic forces. This will help to formulate management strategies to restore soil fertility and to maintain biodiversity.

MATERIAL AND METHODS

Experimental area and sampling site: The present study was conducted in Zanübu mountain range forests in Phek district in southern Nagaland. Mount Zanübu is the highest point at 2426 m above mean sea level, and it is the highest mountain peak in Phek district. The present study was conducted at two forest zones and designated as: zone-I (undisturbed forest) 2000-2426m amsl, which lies between

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Higher Education and Current Unemployment Issue in India: An Analytical Study

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Abstract: ***Unemployment is a persistent problem in India, with significant social and economic consequences. This paper provides an overview of the current state of unemployment in India, including the latest unemployment rate and the factors contributing to this issue. The paper also examines the various measures that the Indian government has taken to address unemployment, such as skill development programs and the promotion of entrepreneurship and foreign investment. Despite these efforts, the challenge of creating adequate job opportunities for the growing population of India remains significant. This paper highlights the need for continued efforts to address unemployment in India and suggests potential solutions for improving the situation.***

Keywords: Unemployment, Difficulties, States, Populations, Economy, India, Illiterate.

Objectives and Method

The objective of this research paper is to analyze the data on unemployment in order to gain adeeper understanding of the extent and nature of unemployment in India. By examining various sources of data and employing statistical analysis, this paper aims to provide insights into the factors contributing to unemployment, the types of unemployment prevalent in the country,and the socio-economic consequences of unemployment.

1. Introduction

Unemployment is the greatest challenge that India is facing today. Unemployment is a situation where the person willing to work, fails to find a job that earns him a living. The reasons for this unemployment situation are high population, defective education system, excessive burden on agriculture, low productivity in the agricultural sector combined with lack of alternative opportunities for agricultural workers, unskilled workforce, etc. Though millions of students are pouring out of educational institutions every year, they are jobless. The supply of jobs is much less than the huge demand. The reason for this huge demand is the increase in population by leaps and bounds. This again gets directly linked up to poverty which aggravates the situation. Due to poverty, illiteracy has spread its harmful tentacles and in the course of time pushed the Indian youth into anti-social activities. Even if they become educated, the failure of getting a job according to their capacity makes them hostile and thus results in strikes and protests. Big cities like Mumbai, Kolkata, and Chennai all are pressurized with the influx of rural folk who come here in the hope of better prospects and as a result, create pressure on the civic amenities.

A little push in the right direction can make a big difference. But are the institutions aware of this? Probably not. The best solution to overcome this problem is to vocationalise the education system. India lacks in the field of entrepreneurship and thus, must focus on producing entrepreneurs. They also promote capital formation and employ resources leading to value addition to a specific industry. According to the present situation, among all the nations of the world the number of students enrolled in higher education in India is the highest, but is it valuable? The youth are getting jobs quite lower than their qualifications or are forced to become the brains of other countries and become productive for other countries because they get more job satisfaction and salary there than in India.Indian economy is also being hampered due to this problem. It is essential therefore that the economic policy of the country be overhauled.

The Current Unemployment Scenario in India

Unemployment Rate in India: According to the recent Centre for Monitoring Indian Economy, a private organization (CMIE) Report, the urban unemployment rate declined to 7.93% in February from 8.55% in the previous month while the rural unemployment rate rose to 7.23% from 6.48%. India's unemployment rate rises to 7.45% in February from 7.14% in January.According to separate quarterly figures prepared by the state-run National Statistical Office (NSO) and released in November 2022, the unemployment rate decreased to 7.2% in the July-September quarter from 7.6% in the preceding quarter.Although India's unemployment rate has historically been high, it is predicted to rise in the next years (Abraham, 2009). In fact, even if the nation's economy continues to expand at a healthy clip, the Organization for Economic Cooperation and Development (OECD) forecast that India's jobless rate will quadruple from 4 percent to 8 percent by 2022.From a 6% unemployment rate in 2017, India's unemployment rate would climb to 8.3% by 2022. According to the estimate, over the next four years, 10 million more people will join the ranks of the unemployed, bringing the total to 220 million by 2022. The government also forecasts that there will be 1 million additional job vacancies over this time period, but it also expects that the number of jobs would not be sufficient to counteract the population expansion in general (Manishsiq, 2023)

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RESEARCH ARTICLE

Repurposing of phyto-ligand molecules from the honey bee products for Alzheimer's disease as novel inhibitors of BACE-1: small molecule bioinformatics strategies as amyloid-based therapy

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Abstract

Alzheimer's disease (AD) is one of the neurodegenerative diseases, manifesting dementia, spatial disorientation, language, cognitive, and functional impairment, mainly affects the elderly population with a growing concern about the financial burden on society. Repurposing can improve the traditional progress of drug design applications and could speed up the identification of innovative remedies for AD. The pursuit of potent anti-BACE-1 drugs for AD treatment has become a pot boiler topic in the recent past and to instigate the design of novel improved inhibitors from the bee products. Drug-likeness characteristics (ADMET: absorption, distribution, metabolism, excretion, and toxicity), docking (AutoDock Vina), simulation (GROMACS), and free energy interaction (MM-PBSA, molecular mechanics Poisson–Boltzmann surface area) analyses were performed to identify the lead candidates from the bee products (500 bioactives from the honey, royal jelly, propolis, bee bread, bee wax, and bee venom) for Alzheimer's disease as novel inhibitors of BACE-1 (beta-site amyloid precursor protein cleaving enzyme (1) receptor using appropriate bioinformatics tools. Forty-four bioactive lead compounds were screened from the bee products through high throughput virtual screening on the basis of their pharmacokinetic and pharmacodynamics characteristics, showing favorable intestinal and oral absorption, bioavailability, blood brain barrier penetration, less skin permeability, and no inhibition of cytochrome P450 inhibitors. The docking score of the forty-four ligand molecules was found to be between −4 and −10.3 kcal/mol, respectively, exhibiting strong binding affinity to BACE1 receptor. The highest binding affinity was observed in the rutin (−10.3 kcal/mol), 3,4-dicaffeoylquinic acid (−9.5 kcal/mol), nemorosone (−9.5 kcal/mol), and luteolin (−8.9 kcal/mol). Furthermore, these compounds demonstrated high total binding energy −73.20 to −105.85 kJ/mol), and low root mean square deviation (0.194–0.202 nm), root mean square fluctuation (0.0985–0.1136 nm), radius of gyration (2.12 nm), number of H-bonds (0.778–5.436), and eigenvector values (2.39–3.54 nm^2) in the molecular dynamic simulation, signifying restricted motion of Cα atoms, proper folding and flexibility, and highly stable with compact of the BACE1 receptor with the ligands. Docking and simulation studies concluded that rutin, 3,4-dicaffeoylquinic acid, nemorosone, and luteolin are plausibly used as novel inhibitors of BACE1 to combat AD, but further in-depth experimental investigations are warranted to prove these in silico findings.

Keywords ADMET · Alzheimer's disease · BACE1 · Honeybee products · Repurposing · Molecular dynamics

Introduction

Alzheimer's disease (AD) is an irreversible progressive neurodegenerative disorder leading to deterioration in cognitive functions and changes in behavior and personality (Martins et al. 2018). AD causes cognitive and functional impairment, including dementia and disability in the older people and it is documented as a public health precedence by the WHO (Scott et al. 2016; WHO 2021). Aging is the main

Nisekhoto Nisa and Vikas Kumar Roy contributed equally to this work.

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RESEARCH ARTICLE

Long-term consumption of fermented pork fat-based diets differing in calorie, fat content, and fatty acid levels mediates oxidative stress, inflammation, redox imbalance, germ cell apoptosis, disruption of steroidogenesis, and testicular dysfunction in Wistar rats

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Abstract

There is a dearth of experimental evidence available as to whether the consumption of fermented pork fat (FPF) food has any harmful effects on metabolism and reproduction due to its excessive calories, high fat content, and fatty acid methyl ester (FAME) levels. We hypothesized that exposure to a FPF-diet with excessive calories, a high fat content, and high FAME levels alters testicular physiology and metabolism, leading to permanent damage to the testicular system and its function. Thirteen-week-old male rats ($n = 20$) were assigned to a high-calorie, high-fat diet (FPF-H, fat-60%, 23 kJ/g), a moderate-calorie, moderate-fat diet (FPF-M, fat-30%, 17.5 kJ/g), a low-calorie and low-fat diet (FPF-L, fat-15%, 14.21 kJ/g) compared to the standard diet (Control, fat-11%, 12.56 kJ/g) orally for 90 days. GC–MS analysis of the three FPF-diets showed high quantities of saturated fatty acids (SFAs) and polyunsaturated fatty acids-ω6 (PUFA-ω6) and low levels of monounsaturated fatty acids (MUFAs) and polyunsaturated fatty acids-ω3 (PUFA-ω3) compared to the control diet. Consequently, the levels of serum FAMEs of the FPF-diet fed rats were significantly increased. In addition, a high level of n-6:n-3 PUFA towards PUFA-ω6 was observed in the serum of FPF-diet fed rats due to the high content of linoleic, γ-linolenic, and arachidonic acid. Long-term consumption of FPF-diets disturbed the anthropometrical, nutritional, physiological, and metabolic profiles. Furthermore, administration of FPF-diets generated metabolic syndrome (dyslipidemia, leptinemia, insulin resistance, obesity, hepato-renal disorder and function), increased the cardiovascular risk factors, and triggered serum and testis inflammatory markers (interleukin-1↑, interleukin-6↑, interleukin-10↓, leukotriene B4↑, prostaglandin↑, nitric oxide↑, myeloperoxidase↑, lactate dehydrogenase↑, and tumor necrosis factor-α↑). Activated testis oxidative stress (conjugated dienes↑, lipid hydroperoxides↑, malondialdehyde↑, protein carbonyl↑, and fragmented DNA↑) and depleted antioxidant reserve (catalase↓, superoxide dismutase↓, glutathione S-transferase↓, reduced glutathione↓, glutathione disulfide↑, and GSH:GSSG ratio↓) were observed in FPF-diet fed rats. Disrupted testis histoarchitecture, progressive deterioration of spermatogenesis, poor sperm quality and functional indices, significant alterations in the reproductive hormones (serum and testis testosterone↓, serum estradiol↑, serum luteinizing hormone↓, and follicle-stimulating hormone↑), were noted in rats fed with FPF diets than in the control diet. Severe steroidogenic impairment (steroidogenic acute regulatory protein, StAR↓; 3β-hydroxysteroid dehydrogenase, 3β-HSD↓; and luteinizing hormone receptor, LHR↓), deficiency in germ cells proliferation (proliferating cell nuclear antigen, PCNA↓), and abnormally enhanced testicular germ cell apoptosis (terminal deoxynucleotidyl transferase dUTP nick end labeling, TUNEL assay↑; B-cell lymphoma-2, BCL-2↓; Bcl-2-associated X protein, BAX↑; and BAX/BCL-2 ratio↑) were remarked in the FPF-diet administered rats in comparison with the control diet. In conclusion, the long-term feeding of an FPF-diet with excessive calories, a high fat content, and high FAME levels induced oxidative stress, inflammation, and

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Sailo Lalrinzuali, Maurya Khushboo and Vikas Kumar Roy contributed equally to this work.

Extended author information available on the last page of the article

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Dietary phytoestrogen diosgenin interrupts metabolism, physiology, and reproduction of Swiss albino mice: Possible mode of action as an emerging environmental contaminant, endocrine disruptor and reproductive toxicant

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ARTICLE INFO

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ABSTRACT

Dietary phytoestrogens are the main source of environmental contamination due to their estrogen-mimicking and endocrine-disrupting effects, posing a threat to microbial, soil, plant, and animal health. Diosgenin, a phytosteroid saponin, is used in many traditional medicines, nutraceuticals, dietary supplements, contraceptives, and hormone replacement therapies against numerous diseases and disorders. It is important to be aware of the potential risks associated with diosgenin, as well as its potential to cause reproductive and endocrine toxicity. Due to the lack of research on the safety and probable adverse side effects of diosgenin, this work evaluated the endocrine-disrupting and reproductive toxicity of diosgenin in albino mice by following acute toxicity (OECD-423), repeated dose 90-day oral toxicity (OECD-468), and F_1 extended one-generation reproductive toxicity (OECD-443) studies. Diosgenin was found to be slightly toxic, with LD_{50} for male and female mice being 546.26 and 538.72 mg/kg, respectively. Chronic exposure of diosgenin (10, 50, 100, and 200 mg/kg) generated oxidative stress, depleted antioxidant enzymes, disturbed homeostasis of the reproductive hormones, and interrupted steroidogenesis, germ cell apoptosis, gametogenesis, sperm quality, estrous cycle, and reproductive performance in the F_0 and F_1 offspring. Long-term oral exposure of diosgenin to the mice disturbed the endocrine and reproductive functions and generated transgenerational reproductive toxic effects in F_0 and F_1 offspring. These results suggest that diosgenin should be used carefully in food products and medical applications due to its potential endocrine-disrupting and reproductive toxic effects. The findings of this study provide a better understanding of the potential adverse effects of diosgenin and the need for appropriate risk assessment and management of its use.

1. Introduction

Phytoestrogens are plant-derived polyphenolic compounds found in various foods that demonstrate a structural resemblance to endogenous human hormones and have numerous health benefits. With their promising recognition as a drug for hormonal replacement therapy, contraceptives, nutraceuticals, functional foods, and dietary supplements, their consumption has been augmented worldwide to the tune of 15–200 mg, especially in the Asian region (Rietjens et al., 2017).

Preclinical studies have evidenced that the intake of phytoestrogens may affect the physiology (hormones and health), and reproduction in humans depending on the exposure (phytoestrogen category, milieu-food/capsule, dose, and bioavailability), race, hormone proportion (associated with age, sex, and physiological status), and health status of

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Repurposing immune boosting and anti-viral efficacy of *Parkia* bioactive entities as multi-target directed therapeutic approach for SARS-CoV-2: exploration of lead drugs by drug likeness, molecular docking and molecular dynamics simulation methods

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ABSTRACT

The COVID-19 pandemic has caused adverse health (severe respiratory, enteric and systemic infections) and environmental impacts that have threatened public health and the economy worldwide. Drug repurposing and small molecule multi-target directed herbal medicine therapeutic approaches are the most appropriate exploration strategies for SARS-CoV-2 drug discovery. This study identified potential multi-target-directed *Parkia* bioactive entities against SARS-CoV-2 receptors (S-protein, ACE2, TMPRSS2, RBD/ACE2, RdRp, MPro, and PLPro) using ADMET, drug-likeness, molecular docking (AutoDock, FireDock and HDOCK), molecular dynamics simulation and MM-PBSA tools. One thousand *Parkia* bioactive entities were screened out by virtual screening and forty-five bioactive phytomolecules were selected based on favorable binding affinity and acceptable pharmacokinetic and pharmacodynamics properties. The binding affinity values of *Parkia* phyto-ligands (AutoDock: −6.00–−10.40 kcal/mol; FireDock: −31.00–−62.02 kcal/mol; and HDOCK: −150.0–−294.93 kcal/mol) were observed to be higher than the reference antiviral drugs (AutoDock: −5.90–−9.10 kcal/mol; FireDock: −35.64–−59.35 kcal/mol; and HDOCK: −132.82–−211.87 kcal/mol), suggesting a potent modulatory action of *Parkia* bioactive entities against the SARS-CoV-2. Didymin, rutin, epigallocatechin gallate, epicatechin-3-0-gallate, hyperin, ursolic acid, lupeol, stigmasta-5,24(28)-diene-3-ol, ellagic acid, apigenin, stigmasterol, and campesterol strongly bound with the multiple targets of the SARS-CoV-2 receptors, inhibiting viral entry, attachment, binding, replication, transcription, maturation, packaging and spread. Furthermore, ACE2, TMPRSS2, and MPro receptors possess significant molecular dynamic properties, including stability, compactness, flexibility and total binding energy. Residues GLU-589, and LEU-95 of ACE2, GLN-350, HIS-186, and ASP-257 of TMPRSS2, and GLU-14, MET-49, and GLN-189 of MPro receptors contributed to the formation of hydrogen bonds and binding interactions, playing vital roles in inhibiting the activity of the receptors. Promising results were achieved by developing multi-targeted antiviral *Parkia* bioactive entities as lead and prospective candidates under a small molecule strategy against SARS-CoV-2 pathogenesis. The antiviral activity of *Parkia* bioactive entities needs to be further validated by pre-clinical and clinical trials.

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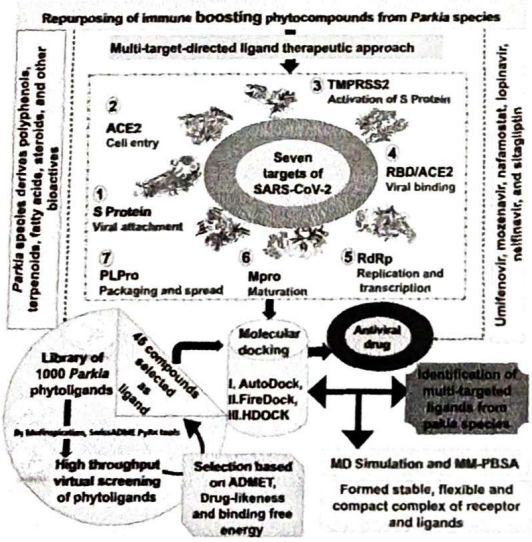

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A Review

Pharmacological and therapeutic potential of honey bee antimicrobial peptides

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Honey bees (Apidae: Apini) and stingless bees (Apidae: Meliponini) act as the main pollinators for many wild and cultivated tropical plants, playing a vital role in the ecology, economy, and culture. Honey bees and stingless bees are one of the major sources of antimicrobial peptides/proteins (AMPs) synthesized in fat bodies and blood cells of bees. Bee AMPs are a class of small peptides having amino acid residues between 9 and 340, classified based on source, activity, structural characteristics, and amino acid-rich species. AMP's have a wide range of inhibitory effects against bacteria, fungi, parasites, and viruses. Four antimicrobial peptide families, *i.e.*, apidaecins (proline-rich), abaecin (proline-rich), hymenoptaecin (glycine-rich), and defensin (cystine-rich) are synthesized in the haemolymph, signifying a broad spectrum of antimicrobial activity. Jelleines (I-IV), royalisin, apisimin (serine-valine-rich peptide), 10 HDA, apalbumin, and apisin, which are present in royal jelly, have antimicrobial, mast cell degranulating, and hemolysis activity. Bee venom also contains several bioactive peptides, such as apamin (leucine-cystine-rich), melittin (leucine-alanine-rich), melectin (lysine-rich), adolapin, secapin (proline-rich), and tertiapin (cystine-lysine-rich). Currently, AMPs databases are displaying an essential role in exploration, identification, characterization, and annotation. Several AMPs databases (CAMP, DRAMP, APD, InverPep, LAMP, ADAPTABLE, ADAM, AntiBP, AMPer, AVPpred, EFC-FCBF, and class AMP) are open-access resources that have been developed to enhance research on antimicrobial peptides. Bee immune responses are composed of a multifaceted group of individual immune mechanisms and special types of behavioral adaptations. Given the importance of drug discovery from honey bee AMPs, this review is aimed at providing an exhaustive screening of the AMPs detected in honey and honeybee products and their classification, databases, computational tools, physicochemical properties, signaling pathways, pharmaceutical and clinical uses, application status, prospects, and problems to be solved.

Keywords: AMPs, Databases, Honey bees, Signaling pathways, Therapeutic applications

Introduction

Honey bees and stingless bees, act as one of the major pollinators in wild forest and agriculture systems, are indispensable for conserving ecological biodiversity, global ecological stability, productivity and economy[1]. Besides, both honey bees and stingless bees are capable to produce different types of honey, royal jelly, bee wax, propolis, bee bread and bee venom based on diverse floral resources visit and can yield significant contributions to human society (Fig. 1). Nevertheless, several factors seemingly lead to bee depopulation and colony/brood loss events, including pathogens (parasites, fungi, bacteria and viruses), ecosystem alteration or loss, and the use of pesticides and antibiotics intimidate wild plant diversity, terrestrial ecosystem stability, crop production, global food supply, and human welfare[2]. The immune system of bees is capable of changing its defence mechanisms, so it is essential to understand how it works in order to examine how it reacts to various pathogenic and stressful situations that affect the health and behaviour of bee colonies (Fig. 1).

Bee immunity serves as an example of the superorganism theory since it relies on both individual and colony-level defence mechanisms to protect bees from infections and stressful situations[3]. Additionally, bees' social immunity—a network of behavioural, physiological, and organizational responses that prevents the admission, establishment, expansion, and transmission of parasites and microbial diseases in the colony—supplements their physiological immune systems. Bee immune responses are comprised of distinctive categories of behavioral adaptations, evolutionary conserved defense strategies (cellular and humoral responses) and assemblage of multifaceted discrete immune mechanisms that afford

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Computational toxicology and food safety assessment of *Parkia timoriana* phytoconstituents using quantitative structure-activity relationship (QSAR) modeling approaches

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As a lead compound, natural compounds have undergone extensive research in different enterprises. Since they might also have other adverse effects, determining their toxicity is crucial. Computational methods can circumvent the main challenges associated with assessing the toxicity of substances using *in vivo* and *in vitro* techniques, including time, money, labor, and the use of animal models. Although *Parkia timoriana* (PT) has a significant economic potential, its exploitation has yet to be thoroughly explored in terms of its toxicity and food safety. In PT seed pod extracts, 61 phytocompounds with a predominance of alkaloids, flavonoids, and terpenoids were identified using GC-MS and LC-MS/MS analysis. Utilizing the TEST, OECD QSAR toolkit, VEGA-HUB, Toxtree, and PASS tools, phytocompounds from PT were assessed for toxicity, food safety risk assessment, and biological activity. The phytochemicals were tested on multiple species, including *Daphnia magna*, *Pimephales promelas*, *Tetrahymena pyriformis*, and rats, to determine their toxicity using the QSAR-TEST tool. For aquatic and mammalian organisms, the phytocompounds from PT were shown to be hazardous in the following four hierarchical orders: i) *P. promelas*>*T. pyriformis*>*D. magna*>*R. norvegicus*, ii) *P. promelas*>*D. magna*>*T. pyriformis*>*R. norvegicus*, iii) *D. magna*>*P. promelas*>*T. pyriformis*>*R. norvegicus*, and *T. pyriformis*>*P. promelas*>*D. magna*>*R. norvegicus*. Despite being non-bioaccumulative, non-mutagenic, and non-carcinogenic in nature, the majority of phytocompounds were developmental toxins. More than half of the phytochemicals derived from PT were highly toxic (Cramer oral toxicity) and manifested negative side effects (with a lower NOAEL value).Most of the substances did not exhibit organ toxicity in the repeated dose toxicity test, were bioavailable, metabolized by cytochrome-P450 pathway, and were excreted from the body. PASS predicted that the examined phytoconstituents from PT were to demonstrate a wide range of anti-oxidant, free radical scavenger, anti-inflammatory, antiviral, anti-fungal, anti-neoplastic, antibacterial, and anti-protozoal activities. For the purpose of exploring drug discovery, additional research of the phytocompounds on *in vivo* models is advised.

Keywords: Computational toxicology, Food safety, GC-MS, LC-MS/MS, *Parkia timoriana*, Quantitative structure-activity relationship modeling, Risk assessment

Parkia timoriana (PT, Fabaceae), also known as the tree bean, is a nutritionally rich, underutilized leguminous tree that grows in northeastern India and various Southeast Asian countries. From an ethnobotanical standpoint, tree beans are significant to ethnic groups in a number of provinces of Northeast India, Burma, Bangladesh, Pakistan, China, Thailand, Malaysia, and the Gambia. Numerous ailments are treated with concoctions of bark, fruit, and leaf portions. All edible parts of this plant, from the flowers and young pods through the mature seeds, are in seasonally high demand and offer a good supply of nutrients[1]. If utilized properly, tree beans could serve as an additional source of vegetable proteins. The protein level of pods ranged from 12.1% in tender to 18.8% in mature pods, but kernels had substantially greater protein content (28.8%) than pods[1] it has been found that the pods of PT contain significant amounts of tannins, flavonoids, saponins, anthocyanins, and leuco-anthocyanins[2]. Tree bean has been found to have antioxidant, α-glucosidase and α-amylase inhibitory, antibacterial, antidiabetic, antiproliferative, antiviral, immune boosting, and insecticidal effects. It has also been used to treat liver and skin diseases, ulcer, colon cancer, leprosy, hypertension, and painful eyes[3]. In the case of PT pods, leaves, and other plant parts are eaten

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MENTAL HEALTH AS PREDICTOR OF EMOTIONAL INTELLIGENCE OF COLLEGE STUDENTS

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Mental Health in Relation to Emotional Intelligence Among College Students

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bstract :- Mental health is of utmost importance id is an issue which has gained momentum obally and emotional intelligence is an emerging end attracting the widespread attention of searchers as an important factor for personality velopment in all aspects of human life. The resent study investigates to assess the leve s of enta heath and emotiona intelligence and a so investigate the relation between menta health id emotional intelligence. A total of 800 ndergraduate from both goverrment and private lleges affiliated to Nagaland University, from the stricts of Kohima and Dimapur were selected ing simple random technique. Descriptive survey ethod was employed for gathering data and andardized questionnaire on Mental Health attery designed by Arun Kumar Singh & Alpana in Gupta and Severfold Emotional Intelligence ale developed by Sarabjit Kaur were dministered to the students and only valid estionnaire was included for the study. Data btained were analysed and results from scriptive statistics showed that college students ve different levels of mental heath and notional intelligence development requires areness and training at the institutional level. rther, results from Pearson's product moment rrelation revealed that mental health and notional intelligence were positively and gnificantly correlated.

ywords : Mental Health, Emotiona Intelligence, dolescence, college students.

troduction :- Our mental health and emotions e rigidly interrelated that it is not possible to ink of one without taking into consideration the ther construct. The need and importance of mental health delivery to the youths in schools and colleges is felt more than ever because of the increasing pressures of life that young individuals encounter daily. (Jain & Singh, 2015)The transition to college is marked by complex challenges in academic, personal-emotional and social adjustment. The present generation particularly the adolescents are constantly under frustrations, tensions, stress, nervousness, anxiety as they try to cope up with daily problems and navigate their place in the society. Salovey & Mayer (1990) and Goleman (1995) asserted that traits such as the capacity to navigate through and to adapt to one's own environment and the possessions of social and emotional 'skills' are important not only for basic survival, but have implications on the areas of relationships, work, school and emotional and mental health. The aspect of mental health of students is found to be influenced by their interpersonal and intrapersonal skills and management of emotions of their own and others or in simple terms their emotional intelligence.

Need of the present study :- There has been a spurt in mental illness in almost every society ever since the corona pandemic paralysing normal human activity, the college students have been the worst affected because of future uncertainties causing mental and emotional problems. As the current generation is so much influenced by the digital revolution, which has led them to spend bulk of their time onscreen and have minimum interaction with families and peers, thereby affecting every aspect of their development. There is a dire need to advocate the importance of mental health in schools and colleges to bring about changes individually, socially and economically. Thus, the present study intend to