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Research Papers

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SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ANALYSIS OF VARIOUS SUBSTITUTED 2-(3-(5-BROMOTHIOPHEN-2-YL)-1-(4-FLUOROPHENYL)-1*H*-PYRAZOL-4-YL)-3-CHLORO-4*H*-CHROMEN-4-ONE

Shirsat A. J., Bhagat S. S., Rupnar B. D. and Kakade G. K.[1]
Department of Chemistry, R. B. Attal Arts, Science & Commerce College, Georai, Beed
[1]Department of Chemistry, Arts, Commerce & Science College, Kille, Dharur, Beed
shirsatamol222@gmail.com

ABSTRACT
A easy going and skilled method has been developed for the synthesis of chlorochromones from chalcones by oxidative cyclization. The procedure is simple workup; High yield and mild reaction condition is the main feature of this method. Newly synthesized chlorochromones has been screened for their antimicrobial activity against Gram +ve and Gram –ve microorganisms.

Keywords: *chlorochromones, chalcones, antimicrobial, Gram +ve and Gram –ve microorganisms.*

INTRODUCTION
Halogenated chromones with a variety of substituents at second position are reported to have coronary antisarcom-180[1], spasmolytic and broncho-dilatory[2] properties. The 3-chlorochromones are related with antifungal and antibacterial activities. Bronchodilatory and Coronary spasmolytic activities are useful in the treatment of asthma[3-5]. The synthesis of 3-substituted chromones are important natural products like isoflavones due to this appears worthy of study and in medicines such as antiosteoporosis drug ipriflavone[6]. The different methods for the synthesis of 3-halochromones were reported by various coworkers. From enaminoketone with halogen containing reagents 3-halochromones are synthesized by Gammill[7]. The 3-Chlorochromones shows various activities like antiviral, antifungal, antibacterial and antioxidant activities[8]. Compounds of chlorochromones moieties are versatile molecules with a reactive carbonyl group having huge significance due to their biological activities[9].

MATERIALS AND METHODS
For the synthesis of the compounds, all required chemicals were obtained from SD Fine chemicals and Sigma Aldrich. Melting points are uncorrected and were recorded in open capillaries. By using Bruker Avance II 400 MHz NMR Spectrophotometer, solvent is DMSO-d_6 and TMS as an internal standard, ^{1}H NMR spectra were recorded. On FT-IR Spectrophotometer Model RZX (Perkin Elmer) on potassium bromide disk, the infra-red spectra were recorded. By using electro-spray method (ES), Mass spectra were recorded on Macromass mass spectrophotometer (Waters). Synthesized compounds purity was checked on TLC plate which is coated by silica gel as stationary phase which is obtained from Merck. In this, mobile phase is solvent mixture of hexane / ethyl acetate (80:20).

GENERAL PROCEDURE
General Procedure for the synthesis of (*E*) 6-bromo-2-(3-(5-bromothiophen-2-yl)-1-(4-fluorophenyl)-1H-pyrazol-4-yl)-3-chloro-4H-chromen-4-one(2g): 0.25 gm, 0.0007 mmole of chalcone (1g) was dissolved in 20 ml of DMSO. Catalytic amount of cuprous chloride ($CuCl_2$) was slowly added in to the reaction mixture. The reaction mixture was heated for 4 hr at 120^{o}C in an oil bath. After the completion of reaction, (monitored by TLC) reaction mass was left overnight. Cold water about 20 ml was gradually added to the flask, solid product was obtained and this product was filtered, washed with water followed by dil. HCl for numerous times. This was again washed with water, dried out under vacuum and recrystallized in ethanol to afford **2g**. The compounds 2(a-g) were prepared by following above general procedure. Physical data of all synthesized compounds **2(a-g)** is recorded in **Table 1**. Confirmed synthesized compounds structures by 1HNMR, Mass and IR spectra.

IR (2g) (cm^{-1}):971(C-Cl), 1077(Ar-Br), 1599(C=C), 1605 (C=N), 1679(C=O).

^{1}H NMR (2g) (DMSO-d_6)δ ppm: 6.7126(s, 1H, Ar-H), 6.8199-6.8441(d, 1H, Ar-H, *J*=9.68 Hz), 6.9245-6.9869(m, 1H, Ar-H), 7.0061-7.1231(m, 2H, Ar-H), 7.2864-7.3968(m, 2H, Ar-H), 7.5439-7.6125(m, 1H, Ar-H), 7.8145-7.8654(m, 1H, Ar-H), 8.1984(s, 1H, pyrazole-H).

ES-MS (2g) (m/z):579(M+1), 581(M+3).

IR (2c) (cm^{-1}):962(C-Cl), 1081(Ar-Br), 1562(C=C), 1595 (C=N), 1668(C=O).

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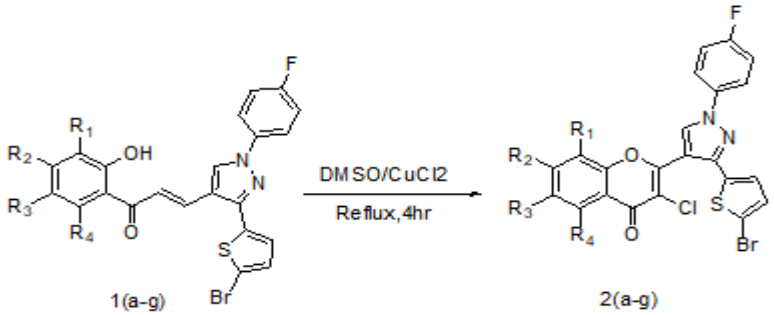
^{1}H NMR (2c) (DMSO-d_6)δ ppm: 6.5974(s, 1H, Ar-H), 6.9354-6.9564(d, 1H, Ar-H, *J*=8.4 Hz), 7.0248-7.0523(d, 1H, Ar-H, *J*=11 Hz), 7.2631-7.5864(m, 2H, Ar-H), 7.6341-7.7453(m, 2H, Ar-H), 7.7787-7.8210(m, 1H, Ar-H), 7.8564-7.9134(m,1H, Ar-H), 8.3653(s, 1H, pyrazole-H).

ES-MS (2c) (m/z):536(M+1), 538(M+3), 540(M+5).



Scheme-1: Synthesis of various (*E*) 2-(3-(5-bromothiophen-2-yl)-1-(4-fluorophenyl)-1H-pyrazol-4-yl)-3-chloro-4H-chromen-4-one

Table-1: Physical data of compounds 2(a-g)

Comp.	R_1	R_2	R_3	M.P. (^{o}C)	Yield (%)
2a	**H**	**H**	**H**	132-134	75
2b	**H**	**H**	**CH_3**	122-124	77
2c	**H**	**H**	**Cl**	144-146	68
2d	**Cl**	**H**	**Cl**	186-188	72
2e	**H**	**H**	**F**	212-214	68
2f	**H**	**CH_3**	**Cl**	168-170	75
2g	**H**	**H**	**Br**	196-198	81

RESULT AND DISCUSSION

All the derivatives of chlorochromones were synthesized successfully to good yields. All newly synthesized compounds were identified on the basis of ^{1}H NMR, melting point range, Mass spectral analysis, IR. Using disc diffusion method, newly synthesized derivatives were screened for antimicrobial activity.

Antimicrobial activity: Compounds **2(a-g)** were analyzed for their in vitro antimicrobial activity against *Escherichia coli (ATCC 25922), Staphylococcus aureus (ATCC 25923), Pseudomonas aeruginosa (ATCC 27853)* by paper disc diffusion method and reference standard drug is Gentamycin. Antifungal activity was analyzed against *Candida sp.* using Nystatin as standard drug. At 100 µg/ml concentration, all the tests were evaluated. Muller Hinton agar was the culture media. The region of inhibition was measured in mm after 24 hr of incubation at 37^{o}C. Microbial data for compounds 2(a-g) are summarized below in **Table 2.**

Table-2: Antimicrobial Analysis Data

Sr. No.	Comp.No.	*Escherichia coli (ATCC 25922)*	*Pseudomonas aeruginosa (ATCC 27853)*	*Staphylococcus aureus (ATCC 25923)*	*Candida sp.*
1	2a	No Zone	No Zone	No Zone	No Zone
2	2b	No Zone	No Zone	No Zone	No Zone
3	2c	No Zone	No Zone	No Zone	No Zone
4	2d	No Zone	No Zone	No Zone	No Zone
5	2e	No Zone	No Zone	No Zone	No Zone
6	2f	No Zone	No Zone	No Zone	No Zone
7	2g	No Zone	No Zone	No Zone	No Zone
8	Gentamycin	28 mm	23 mm	32 mm	--
9	Nystatin	--	--	--	23 mm

CONCLUSION

All the derivatives of chlorochromones were synthesized to good yields. The newly synthesized derivatives of chlorochromones were screened against Candida sp. and Gram positive as well as Gram negative bacterial strains. The synthesized compounds do not show any activity as compared to standard drug. The obtained data during this work shows a good concurrence between the computed and experimental spectral data.

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DIELECTRIC STUDY OF PROPYLENE GLYCOL USING IMPEDANCE ANALYSIS TECHNIQUE

Badhe S. G.
Department of Physics, R. B. Attal College, Georai, Beed, (M.S.)
sgbadhe3@gmail.com

ABSTRACT
Chemical preservatives are frequently used in processed food to prevent growth of bacteria, yeast or other microorganisms, while preventing the growth it also affect the quality of the food. So it becomes necessary to study the strategy of the chemical preservatives. The aim of present work is to estimate electrical properties of food preservative Propylene Glycol in aqueous solution. A low frequency TDR (Time Domain Reflectometry) unit is developed and used for the Impedance analysis. Eleven different solutions of different volume percentage (0% -100% PG) of Propylene Glycol with freshly collected distilled water were prepared and studied. All the solutions are kept in temperature controller unit, which was controlled and monitored by computer. These various solutions are kept under four different temperature (250C, 350C, 450C and 550C). It was observed that the Resistivity (RL) increases with the increase in temp while Dielectric constant decreases with increase in the concentration as well as temperature. There was no conductivity found in the propylene Glycol solution.

Keywords: *Propylene Glycol, Resistivity, Dielectric constant, Conductivity, Time Domain Reflectometry (TDR).*

I. INTRODUCTION

One of the most important functions of food additives is to preserve food products form spoilage. The preservatives prevent the spoilage of food caused by the certain action of microorganisms or oxidants. Along with natural preservatives synthetic chemicals are also used as preservatives. Due to the widespread use of these chemicals a broad variety of food is made available to people for long period of time. But Besides preservation it also affects the quality of the food. So it becomes necessary to study the strategy of the chemical preservatives.

Impedance spectroscopy is traditionally used in monitoring corrosion, testing effectiveness of drug preservatives [1,2] and electro-deposition processes in the coating and characterization assessment of many kinds of sensors and semiconductors [3,4]. Its application in biotechnology for the characterization of cell cultures [5] has, however, been notably expanded in the last decade. The impedance has been applied in the field of microbiology as a means of detecting and quantifying pathogenic bacteria [6,7]. TDR technique is also used in medical field. Blood sugar can be detected with the help of TDR technique.[8]

Impedance spectroscopy is a powerful tool for a fast bio-molecule diagnosis and for analysis in cell cultures [9, 10]. Its superiority over other laboratory techniques lies in that it uses a small signal, thus minimizing the alterations of the properties of the medium, in other words, applied stimulation does not alter the equilibrium conditions of the system. The signal applied to the samples makes it possible to link the properties of the liquid or solid being studied with the variations or changes obtained in its characteristic impedance. This is due to the physical structure of the material, the chemical processes occurring in it, or a combination of both. Consequently, electrochemical impedance spectroscopy is a non-destructive technique providing robust measurements. [10]

A low frequency TDR (Time Domain Reflectometry) unit is developed [11-13] and used for the Impedance analysis. In TDR technique, a voltage step is propagated down through the transmission line towards the sample under investigation and reflected voltage waves are monitored by oscilloscope at particular point on line.

II. EXPERIMENTAL SETUP

The developed TDR unit is of the range 200MHz and 5ns rise time. A co-axial transmission line with characteristic impedance of 50 ohm was used for study of the preservatives. Various rod type and strip types of probes were designed and studied to check the impedance and conductivity using standard solution of known factors. Out of those a strip type probe of 5.5cm length is used for the further study. For the study of the properties of liquid under consideration we immerse the probe in the liquid and collect the information on the oscilloscope.

Temperature controller unit was developed to control the temperature during the experiment. It consists of water bath with an electric heater and a test tube holder, PT100 to sense the temperature, computer to monitor and control temperature.

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The time domain technique has been used for the measurement of electrical parameters of the system. The experimental setup based on time domain technique has been developed for this study. A fast rising step pulse was transmitted through a coaxial cable, which reflects back from the end of cable. The incident and reflected pulses are sampled and displayed on the screen of sampling oscilloscope. The nature of reflected pulse gives the properties of the material at the reflecting end.

The sample cell placed at the termination plays an important role in reflection of incident pulse. In the present setup, a strip line is used as a sample cell. The strip line sensor probe is immersed in the sample of which properties are to be studied. Various types of sensor probes were developed and tested for their TDR response. The stripe line probe of 55mm was selected to carry out the measurements.

The probe calibration is important part of TDR system. The selected probe was calibrated using standard resistors and KCl solution of known conductivity. The result of calibration is the regression equation, which need to be used in calculation of parameters for which the probe is calibrated. In the present experiment, electrical resistivity, electrical conductance, and dielectric constant are calculated.

III. PROPOSED METHODOLOGY AND DISCUSSION

Propylene Glycol (PG) is a colorless, nearly odorless, syrupy liquid that is derived from natural gas. It is used in dozens of products that commonly used. It is used in food – cake mixes, salad dressings, soft drinks, popcorn, food colorings, fat-free ice cream and sour cream. It also protects food from freezing, and helps as a preservative. It is commonly used sweetener in pharmaceuticals.

Food grade Propylene glycol (PG) is used to prepare the required solutions. Eleven different solutions of different volume percentage (0% -100% PG) of Propylene Glycol with freshly collected distilled water were prepared and studied. These different collected concentrations are kept in water bath at different temperatures, 25^{o}C, 35^{o}C, 45^{o}C and 55^{o}C. A probe connected with pulse generator through coaxial cable is immersed in the aqueous solution of Propylene glycol (PG). A fast rising pulse is applied through the coaxial transmission line. The rising pulse gets reflected back from the solution under consideration. The nature of the pulse is depends on the properties of the liquid. This pulse is observed and stored in the Digital Storage Oscilloscope i.e. DSO. This data was then collected in an external storage and further calculations were done. Each time the probe was thoroughly cleaned with acetone and dried.

IV. EXPERIMENTAL RESULTS

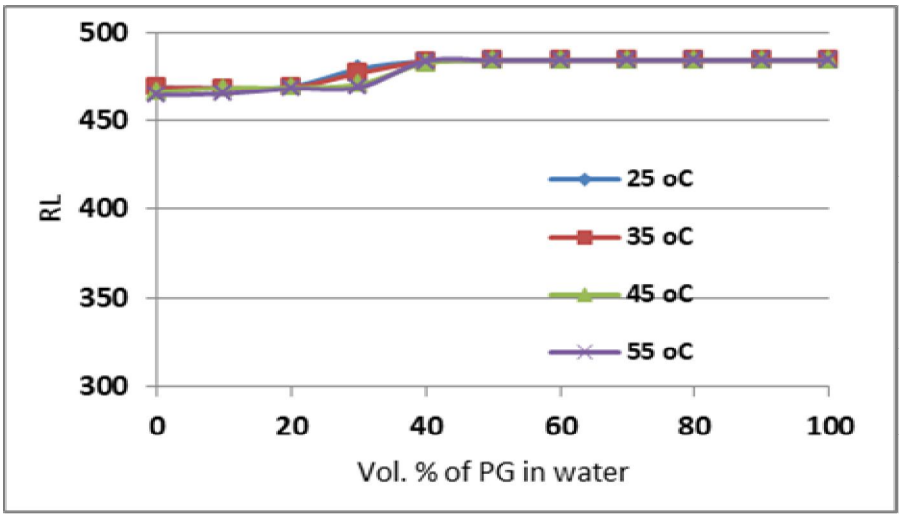

Fig-1: Variation of Resistivity with vol. % of Propylene Glycol in water.

The resistivity of aqueous solution of propylene glycol slightly increases after 20 % volume concentration. This change is about 29%. There is no measurable change in resistivity values with change in temperature from 25^{o}C to 55^{o}C. Overall, there is no remarkable change in resistivity of aqueous solution of propylene glycol with change in concentration and temperature.

The waveform final voltage for all concentrations is almost equal to final voltage of empty cell. This shows the non-conducting nature of propylene glycol.

The aqueous solution of propylene glycol shows decrease in dielectric constant with increase in concentration of propylene glycol in water. At 25^{o}C the dielectric constant changes from 82 to 41. Same type of change is observed at 35^{o}C, 45^{o}C and 55^{o}C.

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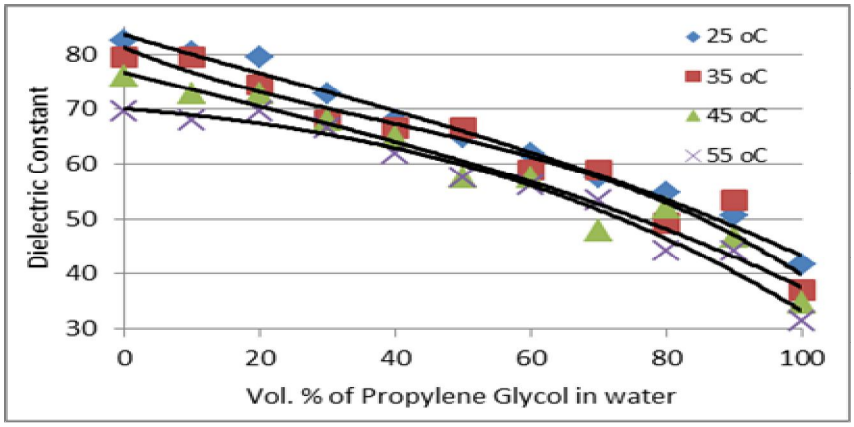

Fig-2 Variation of dielectric constant in aqueous solution of Propylene Glycol.

V. CONCLUSION

The resistivity of aqueous solution of propylene glycol slightly increases after 20 % increase in volume concentration. Propylene glycol is purely non-conducting solution. The aqueous solution of propylene glycol shows decrease in dielectric constant with increase in concentration of propylene glycol in water as well as increase in temperature.

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R. K. NARAYAN'S *THE FINANCIAL EXPERT*: A JOURNEY OF MARGAYYA

Bandal V. S.
Department of English, R. B. Attal College, Georai, Dist. Beed (M.S.)
vijaykumarbandal2@gmail.com

ABSTRACT
R.K. Narayan's The Financial Expert is a masterpiece and the setting is provided by various localities in Malgudi which appear and re-appear in the novel. Margayya is the financial expert and the central character of the novel. As H.M. Williams says, "The Financial Expert is a marvel of plot construction." Its five parts correspondingly represent the five acts of an Elizabethan drama. It tells the story of the rise and fall of Margayya, the financial expert. Argayya shows the 'Marg' or the way to others. He is the financial wizard and an expert in financial matters. Walsh calls Margayya, the hero of the novel, "ProbablyNarayan's greatest single comic creation". Margayya is a human being like us. Like a brooding philosopher, he generalizes his feelings about the role of money in life: "Money alone is important in this world. Everything else will come to us naturally if we have money in our purse."

Keyword: *Money, Indian family, Social customs*

INTRODUCTION

The Financial Expert is a novel written by R. K. Narayan in 1952. William Walsh hails Margayya, the hero of the novel as "probably Narayan's greatest single comic creation." (Ghosh, http://www.shareyouressays.com) It was written in five parts corresponding to the five Acts of an Elizabethan drama. It is the story of the rise and fall of Margayya, the financial wizard. His name was Krishna, but he is popularly known as Margayya. He himself seems to have forgotten his original name, for he signs his name 'Margayya' in legal documents. Explaining the meaning of the term, 'Narayan informs us that it is derived from the compound of 'Marga' and 'Ayya', 'Marga' means the way and 'Ayya' is the honorific suffix. Taken together it denotes who shows the way. Margayya, in fact, first finds his own way to financial prosperity, and thereafter he shows the way out to those in financial trouble.' However, the aim of this research paper is going to focus on the story of Margayya.

Margayya as an ordinary money-lender

The central character, Margayya as an ordinary money-lender starts his business under a banyan tree in front of The Central Co-operative Land Mortgage Bank in order to advise villagers of Malgudi in getting loans from the Co-operative Bank. His excessive desire for money causes him to stop this business and to cherish and pursue dreams of wealth and power. To him money alone matters in life like air and food. This grand thought of getting more money leads him to perform *puja* to Lakshmi, the Goddess of wealth. This episode makes fate to bless Margayya and he climbs up the ladder of money making. It indicates that money wizard Margayya has strong faith in God and Goddess, and it suggests his nature.

Margayya as an Indian Fatherhood

Beging a representative of the Indian fatherhood Margayya shows his prominent interest in the development and growth of his son, Balu. He wishes to send his son to America for higher education after completion of graduation in Malgudi. But Balu hates education and disappears from Malgudi which makes Margayya pathetic. It reflects emotional and sentimental attachment between Margayya as a father and Balu, as a son. Margaya is a symbol of paternal love and affection. Unable to tolerate Balu's disappearance, his mother Meenakshi and others force Margayya to leave for Madras and Marrgayya is helped by the police inspector in the search of his son. Parents in Indian family context always think of the welfare and progress of their son. Balu's coming back to Malgudi is a source of Meenakshi's boundless happiness. Here, Narayan presents Indian fatherhood and motherly affection through the episode of Balus's disappearance.

Episode of Hindu Marriage

Margayya's search for a girl for his son's marriage shows the tradition bound and horoscope-matching Hindu society. After a long search Margayya decides to settle Balu by arranging the wedlock with Brinda, a daughter of the owner of tea-estate in Mempi-Hills. When the horoscope does not match he keeps himself quiet from the old beliefs in the planets. He thinks that astrologer's advice is a formality and shows his faith in hard work. The whole episode presents him as a man of progressive ideas. The growth and development of Margayya is paralleled with the growth of Malgudi. With the help of Dr. Pal Margayya starts his business of money lending and opens his office at 10, Market Road. He begins to get deposits on twenty percent interest and keeps counting money till midnight. There are different calculations in Margayya's mind during his meal.

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Image of Indian Wife

Meenakshi, Margayya's wife, worries about his health. As an Indian woman she always thinks of her husband's welfare and worries over his thin appearance. Meenakshi's attitude towards her husband presents the nature of Indian woman-hood. Margayya brings money in sacks in the car. The element of chance brings a break in Margayya's happy life. Balu's demand of a share in property leaves Margayya shocked. In the company of Dr. Pal, Balu follows immoral ways of life and refuses to give attention towards his wife and son. Balu is found in the company of hasty girls. The wheel of fortune turns a full circle. Suspecting Dr. Pal's role in Balu's life, Margayya beats Dr. Pal. However, the evil days begin to rise in the course of Margayya's life. The depositors start to withdraw their money from Margayya's bank as persuaded and prompted by Dr. Pal. The end of the episode shows Balu's coming back to the old house from his *villa* with his wife and child and helpless money wizard begins his old profession of a financer under the banyan tree, which shows how Narayan treats his recurrent theme return of the native.

Margayya and Dr. Pal

Margayya has lost everything and is about to return to the banyan tree where he started to play the role of a financial expert. The element of chance lands him in deep distress. The cyclical structure of the novel is analytical of the recurrent theme of return of the native. It reflects the reality that the foul means are punished. The novel is dominated by the economic motivation and love. Margayya a business transact or under banyan tree becomes a noble man in money lending profession but Margayya does not change. His decision to go back to the banyan tree suggests starting life afresh and hopefully. The two important deciding forces Dr. Pal's meeting with Margayya and Dr. Paul's meeting with Balu are the strokes of coincidence. The preceding force symbolizes the cause of prosperity and it values the profession of Margayya as a financial expert. The second deciding force is the chance meeting of Dr. Pal with drunken Balu, which Margayya feels will lead to the financial ruin. The coincidence in novel carries double meaning. Thus coincidence stands for prosperity as well as adversity. It remains a tool of good and bad in life.

Episode of Father- Son Relationship:

Maragayya's action, right from the beginning is pushed forward by the sameness of purpose. The initial career of Maragayya as a small moneylender under a banyan tree fixes the tone of the novel. The religious attitude of the comman people is shared by Margayya. His meditation to pacify Laxmi, the Goddess of wealth to extend his financial frontiers shows that he believes in astrology and that it takes the plot further. Margayya, as a Money-mystic and financial wizard gives the novel fantastic colouring. The rise of Margayya as a money lender shows monstrosity. The organic unity of construction is not permitted to be marred by Balu- Dr. Pal axis. On the other hand its very episode and personage in *The Financial Expert* intends to forward the plot and observes the unity of impression. *The Financial Expert* pictures human relationship which forms the structure of the novel. The middle-class family in the locale like Malgudi is a constituent of Margayya's portrayal. Thus, the novel deals with the father-son relationship in a psychological manner.

The Realistic Character Margayya:

Margayya is the central character of the novel, whose real name is Krishna. He has gradually got into the habit of signing his name Margayya even in legal documents and everyone else also calls him so. Literally,

> '…the word Margayya being a derivative of the word Marga with Ayya as an honorific suffix means 'the one who shows the way.' [http://etheses.saurashtrauniversity.edu/id/828]

The full significance of his name is explained by the novelist himself in the beginning of the book, 'He showed the way out to those in financial troubles. And in all those villages that lay within a hundred-mile radius of Malgudi was there anyone who could honestly declare that he was not in financial difficulties? [*TFE*. 1952, p. 2-3] The multiple irony of his nickname mirrors before us very clearly that the person who shows the people the way out of their financial problems, does not himself display enough skill in managing the money he has suddenly earned.

Margayya: Economic Position

Margayya curses himself for his low economic position, and genuinely feels that the world treats him with disrespect and contempt because he has no money. He is very agitated, as if he had made a new and startling discovery. Much frustrated after mysterious actions of throwing his account book into the gutter by his son Balu, he seeks refuge in religion. The entire elaborate episode of the Lakshmi - Worship at the behest of the priest and its coincidental success, is both ironic in nature and has also a touch of fantasy about it which does not strain the normally superstitions reader's willing suspension of disbelief excessively. This is actually the

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manner in which Narayan himself guided the people of his region, although he was no bank officer yet he was good at accounting and money management, and so he helped the needy with advice free of cost. Telling his wife about the threat held out to him by the secretary of the cooperative Bank, he says: 'He has every right because he has more money, authority, dress, looks above all, more money. Its money which gives people all this. Money alone is important in this world. Everything else will come to us naturally, if we have money in our purse.' [p. 17] Margayya is the product of a bourgeois society where money holds the sway in all walks of life, just as Narayan was a product of his society which reflects the same thought. Becoming obsessed with the pursuit of money, he reflects: 'People did anything for money. Money was man's greatest need, like air or food. People went to horrifying lengths for its sake, like collecting rent on a dead body: yet this didn't strike Margayya in his present mood as so horrible as something to be marveled at. It left him admiring the power and dynamism of money, its capacity to make people do strange deeds.' [p. 22] In his view 'If money was absent men came near being beasts.' [p. 27] He often reflected on the power of money: 'people did anything for money… Obsessed with the thought of money, Margayya falls victim to its overbearing influence. His immediate concern was to attain material benefits, such as unlimited affluence, foreign studies for Balu, his only son, his possible marriage with a judge's daughter, and the realization of the next generation of aristocrats in his family, filled his mind night and day. His only salvation lay in acquiring the riches he coveted. A priest appears to read his mind and he tells Margayya: 'Wealth does not come the way of people who adopt half-hearted measures. It comes only to those who pray for it single mindedly with no other thought.' [p. 29] All vibrations of R.K. Narayan's thought can be seen in the protagonist. The best way to fulfill his desire, he presumed, would be to consult the temple priest.

Margayya: Mytholgy and Cultue

Margayya sought the priest out and waited patiently for an opportunity to confide in him. The atmosphere in the temple on that late evening swayed his mind towards the mysterious and awesome superiority of gods and goddesses of his culture. The priest tells Margayya the significance of Puja (ritual worship conducted to appease the Hindu pantheon of gods or goddesses) to obtain one's aims and objectives. Margayya, as he sat in the sanctorum, reflects on the image of Hanuman, the God of power, the son of Wind. According to tradition this God had pressed one foot on the very spot where the shrine now stood, sprang across space and ocean and landed in Lanka.., 'there to destroy Ravana, a king with ten heads and twenty hands, who was oppressing mankind and had abducted Rama's wife Seetha.' [p. 33] Even the legends and myths, as contained in the *puranas* are mere illustrations of the moral and spiritual truths enunciated in the *Vedas* each forms a part and parcel of a total life and is indispensable for the attainment of a four- square understanding of existence. When Margayya refuses to drink the tumbler of milk, the priest admonishes him thus: 'Milk is one of the forms of Goddess Lakshmi, the goddess of Wealth. When you reject it or treat it indifferently, it means you reject her. She is a Goddess, who always stays on the tip of her toes all the time, ever ready to turn and run away. There are ways of wooing and keeping her. When she graces a house with her presence, the master of the house becomes distinguished, famous and very wealthy. Margayya's reaction is typical. He 'reverently touched the tumbler and very respectfully drank milk, taking care not to spill even a drop.' [p. 35] The priest also relates the story of Kubera, from the Mahabharata, who had to go through an arduous penance in order to atone the spilling of a drop of milk on the floor of his palace. Unable to hold back any longer, Margayya requests the priest, 'I want to acquire wealth. Can you show me a way? I will do anything you suggest.' [p. 35] Margayya's attitude is a fine example of the human tendency of becoming desperate to realize one's ambitions, often overlooking the adverse effects of pursuing them.

Margayya as a financial wizard

Margayya, the financial wizard, is very much in need of financial guidance himself, after his young, impish son, Balu, has thrown his little box containing his cash books into the gutter. At the suggestion of the priest, he performs a rigorous forty-day ritual to please the goddess Laxmi, but there is no visible outcome of his ordeal. This particular incident has signifier in view of Narayan's belief in superstitions and certain rituals, followed blindly by him to please the Goddess Laxmi to gain material prosperity. It is by a sheer stroke of chance that he happens to meet Dr. Pal, who calls himself a sociologist, and who has authored a naughty script, entitled *Bed-Life or the Science of Marital Happiness*. Dr. Pal literally forces the script on Margayya, telling him that he can make millions out of it. Margayya takes the script to a printer named Madan Lal who gets so interested in it that he offers to publish it on a partnership basis. And soon pots of money begin to flow in for both of them from this book which is retitled, for the sake of decency, for the sake of decency, Domestic Harmony. Finally God showers his blessings in one form or the other. Surrounded with heaps of money, Margayya's attitude to money becomes quase-mystical. The more he meditates on the question of interest that money can earn, the more it seems to him 'the greatest wonder of creation. It combined in it the mystery of birth and multiplication. Every

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rupee, Margayya felt, contained in it seed of another rupee and that seed in it another seed and so on and on to infinity. It was something like the firmament, 'endless Stars and within each stars an endless firmament and within each a further endless… It bordered on mystic perception. It gave him the feeling of being part of an infinite existence.' [p. 94] Margayya Parts Company with Madan Lal gets his share and quits, Dr. Pal again helps him to start anew his business of money lending. Margayya tells Guru Raj: 'Guru Raj, money is the greatest factor in life and the most ill used. People don't know how to tend it, how to manure it, how to water it, how to make it grow, and when to pluck its flowers and when to pluck its fruits. What most people do is to try and eat the plant itself.' [p. 108] As a father Margayya failed as a result his son Balu goes astray, he runs away from home. He does not feel the loss of his son due to his own money-making adventures: 'His affluence, his bank balance, buoyed him up and made him bear the loss of their son. He lived in a sort of radiance which made it possible for him to put up with anything.' [p. 121] But his wife's condition prompts him to go to Madras to look for Balu where he does find him and brings him back.

The climax: Margayya's Misfortune

The climax of Margayya's misfortune in this sphere of his life comes when the boy simply runs away from Malgudi. Balu symbolically suggests Margayya's less attention towards his family. One may witness Margayya's notion of deviation projected in his son, Balu's marriage. In the course of his railway journey to Madras, Margayya, with the help of the police inspector, finds Balu in a cinema house working as an advertisement boy. Balu, with his father, returns to Malgudi where Meenakshi receives him with joy. The money minded Margayya feels greatly flattered and puffs up with pride when he receives a score of matrimonial offers for his son. Ironically, however, the brilliant rise of fortune turns into the meteoric fall of misfortune as well. The fall of Margayya, ironically seems to have been acted quickly by his son, Balu. Balu's important role in Margayya's fall shocks not only his father but also everybody by asking for his share of ancestral property. Margayya declares insolvency as, there seemes to be no end to the demands of clients for their deposits back. The ironic realization of insolvency indicates Margayya's total fall in life. The narrator explains: 'Margayya could sit up no longer. He just flung himself down on the floor beside the window. No air could come in. There were terrifying faces all around and babble of voices, and over it all came the cry of an ice-cream pedlar: Ice Cream. Ice Cream for thirst! as his bell tinkled.' [p. 176] The fall of Margayya, in true sense, resembles the fall of the king Midas in *In Golden Touch* who found it impossible to eat the food. Likewise, Margayya also lost his desire for food. If the fall is considered the effect of Margayya's rejection of Saraswati, it may equally be considered the consequence of Margayya's indifference to his wife who in the Indian tradition is given importance as the Laxmi in the home.

The character of Margayya may be considered from the two points of views positive and negative. When he desires to have more money in order to gain social and financial status Margayya consults the temple priest. On the advice of the priest he performs the puja to the goddess of wealth, Lakshmi for forty days. All this shows Margayya a conventional man who values spiritual power. He seems to be selfish and optimistic. Margayya obliges and respects Hindu rituals and rites. He wills to go to Banaras on foot. He disrespects astrologer's opinions on Brinda's horoscope. Margayya decides to marry his son with Brinda even though the two horoscopes do not match. He is of the opinion that consulting the astrologer is just a formality. Margayya's progressive ideas and modern outlooks are noticed. Margayya is projected under the influence of materialism. He is haunted by the thought of money and estimates everything in terms of money. His wife, Meenakshi is always worried about her son, Balu. Her anxiety is the welfare of her husband. There are various themes discussed in the novel such as father-son relationship, mother-son relationship, man to man relationship, generation gap, modernity verses tradition and theme of rebellion. The theme of father-son relationship is presented in its complete form, in which Margayya; Balu's father gives very much importance to nothing except money in his life. He admits his son Balu in the convent school to show people around him that he is a son of a rich Margayya family. Balu's failure in S.L.C. examination and news of his death make Margayya disgusted and pathetic which underlines father's emotional attachment. Balu's mother Meenakshi is a woman of profound and broader heart who always worried about her son. She becomes extremely pathetic when her son, Balu disappears from parent's roof. She merely said: 'Tell me about Balu. That is what I need, not clothes.when Meenakshi hears the news of his death she burst into tears.' [p. 147] The relationship between Margayya and Dr. Pal is complicated and it shows that they are attached to each other for their individual interests. Their financial interest in the initial stage is a reason of their successful relationship. Margayya's excessive attachment to money leads him to propiate the goddess Lakshmi. Understanding Margayya's earnest desire for money Dr. Pal wins his heart and tells him that it is money that gives people authority, dress and looks. Margayya realizes that Dr. Pal is the only man equal to his disposition. Hence, he positively responds Dr. Pal's

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statement. Dr. Pal forces Margayya to buy manuscript on *The Bed Life* based on *Kamsutra* which turns him into a rich man over night. He also helps Margayya in arranging his son's marriage with a rich girl, Brinda.

The Summing Up

Thus, the central character Margayya in *The Financial Expert* worked under a Banyan Tree in front of a co-operative and Land Mortgage Bank and in the end he again returns to the same business. Novelists art of characterization provides a mixed Fare. His chief concern as an artist is with the characters. His Delineation of characters has rare qualities of economy and Delicacy.

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ILLUSION AND REALITY IN R. K. NARAYAN'S THE NOVEL SWAMI AND FRIENDS

Bandal V. S.
Department of English, R. B. Attal College, Georai, Dist. Beed (M.S.)
vijaykumarbandal2@gmail.com

ABSTRACT
Swami and Friends *(1935) is the first novel in which R.K. Narayan is realistic in his treatment of characters and society. On the surface level the novel appears to be a story of boys for boys. It novel encompasses all the stock material of a school story: family, particularly Swami's relations with his father, his friendship, his quarrels, his teachers, his idleness, his homework, his examinations etc. From the beginning to the end the novel narrates the adventures and misadventures of a schoolboy's life; Narayan's account of them, according to Gor, is "realistic and psychologically true" (60). As the title suggests, the novel deals with the central character, Swami and his friends, Mani and Rajam. The plot of the novel is held together by the adventures and misadventures of the innocent school-boys. There is a series of nostalgic, anecdotes of boyhood. The perplexities of youngsters are treated with a clever mock-seriousness. The novel is written in a simple style which the novelist was to polish and perfect in his subsequent novels.*

Keywords: *anecdotes, nostalgic, infatuation.*

INTRODUCTION

R.K. Narayan very realistically depicts the impact of marriage on a young man like Chandran. After the marriage, he is a completely changed man, lost in his own thoughts. He is obsessed with his wife "Susila, the fragrance of jasmine and sandal paste, the smokiness of the Sacred Fire, of brilliant lights, music, gaiety, and laughter (164). For a month or so he is absorbed in monologues centering upon Susila and things related to her. What is funny is that he indulges in these monologues in the presence of Mohan, but all this is true to life. Chandran spends much of his time in writing letters to his bride an in reading her letters. Since he has to live away from nearly a year, he depends on these letters to keep emotional and mental company with her. He tells Mohan even the subject of these letters. A few bits of his talks with Mohan show his rapturous infatuation for Susila. The narrator tells:

His talks to Mohan were usually on the subject of these letters. "She has written a wonderful letter to me to-day, has addressed me as 'My Own Darling' for the first time; she has sent me twenty thousand kisses though I sent her only fifteen thousand in my letters…" Or "She likes very much the silk pieces that I sent to her. She says that they are wonderful." Or, touching his inner pocket, in which more than one of her letters always rested, "Poor girl! She writes asking me to take very great care of my health. Says that I ought not to get up so early every morning. She has inquired about the business and wishes me more subscribers. She wishes the Daily Messenger long and life and health. She has a very great sense of humour" (165).

It is not only the joy in married life that Narayan paints; he also paints worries and agonies associated with the love of young couple. He describes Chandran is upset when he does not receive Susila's letter for six days in continuation. He fears that she may be down with high fever, because she had written in her last letter about her catching cold. There is no solution to his apprehension and gloom but to go to Talapur immediately for he does not know "if her people will attend to her properly…I must go in person and see" (166). The Bachelor of Arts is thus a romantic tale of two young minds. When the love does not mature into marriage, sanyasi is the result of it. This state too is romantic because Chandran knows that it temporary. This romantic tale allows Narayan to introduce his ironic and comic view of life. This is the novel of youth and its passion, illusion and heart breaking disillusionment-reality.

The novelist's greatness lies in his depiction of boy's psychology and his credulity in his first novel Swami and Friends. The issue of illusion and reality becomes prominent when the narrator describes the world of boys. That world is, as already noted, the world of illusion; R.K. Narayan creates illusion of reality when he describes that world. Through Swami's encounter with the scripture teacher Ebenezar, the novelist throw light on the boy's innocence and at the same time he exposes and ridicules religious fanaticism and credulity as well. The scripture master condemns Hindu idolatry and shows Sri Krishna in a very bad light while comparing Him with Jesus.

The world in which Swami occupies the central position is really an interesting world of a boy with his innocence. In Malgudi-the illusion of real world-he can always fall back on his grandmother to take his part against the incomprehensible bad temper of father and schoolmaster. Adults appear quite mad to Swami. His

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father is liable to fly off into a rage when he finds his son wandering about the house like an unleashed donkey before the examinations are due to begin. R.K. Narayan creates the illusive town and presents it realistically. The characters who move in its territory are real ones. The novelist explains the life and the people of

Malgudi of preindependence time. That Narayan creates an illusion of the town is made clear by the fact that he never dealt with the physical geography of Malgudi as a set of piece. He simply allows it to reveal itself beneath and between the events. The reader comes to have a strong feeling for the place's identity.

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SYNTHESIS AND ANTIMICROBIAL ANALYSIS OF SUBSTITUTED 2-(5-(3-(2,4-DIFLUOROPHENYL)-1-(4-FLUOROPHENYL)-1H-PYRAZOL-4-YL)-4,5-DIHYDROISOXAZOL-3-YL)PHENOL

Bhagat S. S., Shirsat A. J., Rupnar B.D. and Gill C. H.[1]
Department of Chemistry, R. B. Attal Arts, Science and Commerce College, Georai, Dist. Beed (M. S.)
[1]Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
sunilbhagat2010@gmail.com

ABSTRACT
Isoxazolines are known as the dihydro derivatives of Isoxazoles. They are also beneficial as intermediates for the preparation of a broad variety of biologically active natural products. The newly prepared compounds were screened for their antimicrobial and antifungal activity against Gram-ve and Gram +ve microorganisms. Moderate activity was shown by some compounds against standard drugs.

Keywords: *Isoxazolines, antimicrobial agents, 2-(5-(3-(2,4-difluorophenyl)-1-(4-fluorophenyl)-1H-pyrazol-4-yl)-4,5-dihydroisoxazol-3-yl)phenol.*

INTRODUCTION
Isoxazolines areuseful as antiseptic, in tuberculosis, antiviral, for fungal treatment, herbicidal, kills insects and antidepressant agents [1-5].Isoxazolines are also known to be the dihydro derivatives of Isoxazoles. Isoxazolines are important part of a molecular structure responsible particularly in several pharmacologically significant drug molecules. They are also beneficial as intermediates for the preparation of a broad variety of biologically active natural products [6]. These derivatives have played animportant role in the theoreticaldevelopment of heterocyclic chemistry and also useful in organic synthesis [7].

Heterocyclic compounds containing nitrogen and oxygen have acknowledgedextensiveconsideration due to their widespreadarray of pharmacological activity. Isoxazolines denote one of the active classes of compounds keeping a variedrange of biological activities. Isoxazolines have been testified to possess antidiabetic [8], diuretic [9], analgesic [10], anthelmintic [11], hypolipaemic [12] and antimicrobial activity, antioxidant, cytotoxicity [13]. In recent years, this heterocycle has received considerable attention due to the biological significance.

Isoxazolines are very useful heterocycles in medicinal andorganicchemistry. Organic chemists use Isoxazoline rings forsynthetic preparation toaddress complex molecular designs. Valdecoxib, Leflunomide, Isocarboxazid, Micafungin and Oxacillin are the examplesof drugs to confirm the pharmaceutical approval of such heterocyclic systems. Whenappropriatelymade within a minor molecule, these supports have been frequentlyconsidered asstable amide replacements. Hence, novel synthetic practices to make theseheterocycles with variations of exchanges are extremelyanticipated.

EXPERIMENTAL
A General procedure for the synthesis of 4-chloro-2-(5-(3-(2, 4-difluorophenyl)-1-(4-fluorophenyl)-1*H*-pyrazol-4-yl)-4, 5-dihydroisoxazol-3-yl)-5-methylphenol (2f):

Compound **1f** (0.01mol) was dissolved in 15 ml ethanol. To this reaction mixture, 0.02 mol of hydroxyl amine hydrochloride added. After dissolution process, freshly fused anhydrous sodium acetate (3.0g) was added to this solution. Contents were heated under mild reflux for 7 hr and then cooled to room temperature. The progress of the reaction was monitored by Thin Layer Chromatography. Cold water (50ml) was slowly added to the flask and separated product was filtered, washed with cold water for several times and crystallized from methanol to obtain purified isoxazoline. The compounds **2(a-g)** were prepared by following the general procedure. Physical data are recorded in **Table 1**. and Antimicrobial data given in **Table 2** Their structures have been confirmed by IR, ^{1}HNMR and Mass spectra.

IR (2f) (cm^{-1}): 964(C-Cl), 1101(Ar-F), 1265(C-O), 1515(Ar C=C), 1598(C=N), 2925(Ar-CH_3), 3134(O-H).

^{1}H NMR (2f) (DMSO) δ ppm: 2.2769 (s, 3H, CH_3), 3.620-3.716 (dd, -CH_2-, *J*=9.1Hz & 9.1 Hz)

3.805-3.940(dd, -CH_2-, *J*=10.0Hz &10.4 Hz), 5.6158-5.6420(t, 1H,-CH-, *J*=9.1 Hz & 8.6 Hz),6.6332 (s, 1H, Ar-H), 6.8451-6.8522(m, 2H, Ar-H), 6.9035-7.3188(m, 1H, Ar-H), 7.3294-7.4348(m, 3H, Ar-H), 7.5051-7.6352(m, 2H, Ar-H), 8.6798 (s, 1H, Pyrazole-H), 10.20 (s, 1H, Ar-OH).

ES-MS (2f) (m/z):484.43 (M+1), 486.41(M+3)

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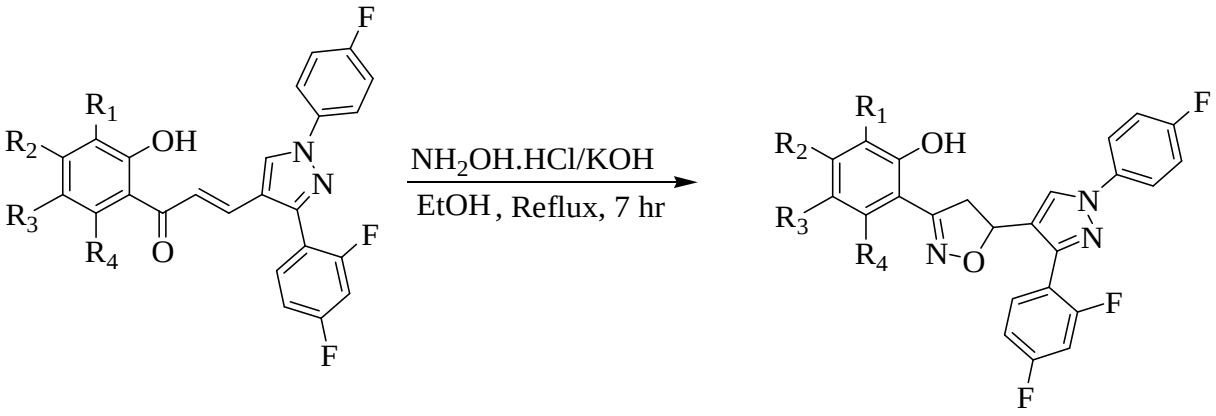
Scheme



1(a-g) **2(a-g)**

Scheme-1: Synthesis of various substituted 2-(5-(3-(2,4-difluorophenyl)-1-(4-fluorophenyl)-1H-pyrazol-4-yl)-4,5-dihydroisoxazol-3-yl)phenol

Table-1: Physical data of compounds 2(a-g)

Comp.	R_1	R_2	R_3	M.P. (^oC)	Yield (%)
2a	H	H	H	118-120	70
2b	H	H	CH_3	156-158	69
2c	H	H	Cl	110-112	72
2d	Cl	H	Cl	120-122	67
2e	H	H	F	134-136	65
2f	H	CH_3	Cl	90-92	70
2g	H	H	Br	160-162	72

RESULTS AND DISCUSSION

Antimicrobial activity:-Compounds **2(a-g)** were screened for their in vitro antimicrobial activity against Escherichia coli (ATCC 25922), Pseudomonas aeruginosa (ATCC 27853), Staphylococcus aureus (ATCC 25923) using Gentamycin as a reference standard drug by paper disc diffusion method. Antifungal activity was evaluated against Candida sp. using Nystatin as standard drug. All the tests were evaluated at 100 µg/ml concentration

Table-2: In-*vitro* antimicrobial activity of various substituted 2-(5-(3-(2, 4-difluorophenyl)-1-(4-fluorophenyl)-1*H*-pyrazol-4-yl)-4, 5-dihydroisoxazol-3-yl) phenol 2(a-g).
Disc Diffusion Method

Sr. No.	Compound No.	Inhibition Zone Diameter (mm)			
		E. coli **ATCC25922**	***Pseudomonas aeruginosa*** **ATCC27853**	***Staphylococcus aureus*** **ATCC 25923**	***Candida sp.***
1.	2a	No zone	No zone	No zone	No zone
2.	2b	No zone	No zone	No zone	No zone
3.	2c	No zone	No zone	No zone	No zone
4.	2d	No zone	No zone	No zone	No zone
5.	2e	No zone	No zone	No zone	No zone
6.	2f	No zone	No zone	No zone	No zone
7.	2g	No zone	No zone	No zone	No zone
8.	Gentamycin	20	20	24	--------
9.	Tetracyclin	20	No zone	25	--------
10.	Ketoconazole	--------	--------	--------	23

CONCLUSION

All the synthesized compounds were screened for antimicrobial activity. All the compounds screened showed no antibacterial and antifungal activity comparable with that of standard drug tested.

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AQUATIC ZOO FAUNA FROM HARSOOL LAKE DIST: AURANGABAD

Budrukkar A. M. and Nimbalkar R. K.
Department of Zoology, R. B. Attal College, Georai, Dist. Beed (M. S.)
anirudhabudrukkar@gmail.com

ABSTRACT
The study of Zooplankton is important to find out productivity of lake for pisciculture. There are large numbers of animals which are economically important for nature as well as human being. The investigation carried out for seasonal changes and their impact on zooplankton. The result showed that Rotifers were dominant in all seasons. The detail of results and analysis discuss in text.

Keywords: *Seasonal impact, Harsool Lake*

INTRODUCTION
The fish population of our aquatic system plays an important role in the economy. There are large numbers of living aquatic animals, which are significant for nature as well as human being for their using as food. Harsool Lake is present in Harsool area of Aurangabad which is important for fisheries and irrigation purpose. Since plankton data of this reservoir helps in fishery research and also beneficial for the fisherman for economically important aquatic animals and also for the water quality improvement.

MATERIAL AND METHODS
The zooplanktons are collected in the morning using plankton net. The size of plankton net is 30mm. Zooplankton were preserved in 4% formalin. Zooplanktons are identified as per guidelines given by Ward and Whiple (1958)

VALUES OF ZOOPLANKTONS STUDY

Zooplanktons	Rainy season	Winter season	Summer season	Total
Rotifers	35	44	65	144
Ostrocoderms	39	28	11	82
Copepods	25	34	30	89
Cladocera	23	30	25	78

RESULTS AND DISCUSSION
The population diversity shows the Rotifers were dominant all seasons. The data indicates that light intensity play important role in population of Rotifers. In summer seasons water is clear and helps in increase the population.

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BIOCHEMICAL STUDIES OF CESTODE PARASITE *GANGESIA* FROM *CLARIAS BATRACHUS*

Budrukkar A. M. and Nimbalkar R. K.
Department of Zoology, R. B. Attal College, Georai
anirudhabudrukkar@gmail.com

ABSTRACT
This paper contains biochemical study of cestode genus Gangesia of Clarias batrachus to understand their host parasite relationship. The protein contents in cestodes were estimated by the method given byGornell et al. (1994) and lipid content were estimated by the Barner`s and Blackstock method (1973).

Keywords: *Gangesia, Cestode Parasite, Clarias batrachus*

Protein estimation: The intestine of *Clarias batrachus* were examined at laboratory. The identical parasites were sorted out with the help of microscope. Small pieces of infected host intestine were also collected for the protein estimation. The protein content in the cestode parasites was estimated by Brand (1966) and Gornell *et al.* (1994) method. The worm were dried on blotting paper to remove water and taken wet weight of the tissue. The material was transferred in to previously weighted watch glass and kept in oven at 60°C for 24 hrs. Dried material was made into powder form. This powder weighed 250 mgs on balance. This material was grind with the help of morter pastle. Added with 5 ml of 10% TCA. Material was transferred to test tube and centrifuged for10 min. at 2000 rpm. Discard the supernatant and taken the residue add 1 ml of distilled water and 3 ml of Biuret solution. The tube was kept for half hour until lavender colour is developed. Colour reading was noted on colorimeter at 530 mm to note Optical density.

$$\frac{\text{O. D. of Unknown tissue}}{\text{O. D. Of known tissue}} \times \text{mg of Protein} \times \frac{1000}{\text{weight of taken tissue}}$$

O. D. of unknown tissue = 0.39

O. D. of known tissue = 0.58

mg. of protein = 10

$$\frac{0.39 \times 10}{0.58} \times \frac{1000}{250}$$

= 26.88 mg/gm. wet weight of the tissue.

By the same procedure amount of protein in the host intestine was estimated. The results showed that the intestine possessed 31.47 mg/gm. wet weight of the tissue. These two comparisons reveal that *Gangesia absorbed* 26.88 mg/gm.

Lipid estimation: The intestine dissected and were found to be infected with the cestode. Parasite and host intestine kept in watch glass. This material was taken on blotting paper to remove excess of water and then it was weighted on balance to obtained wet weight of tissue. Tissue then kept at 80°C to completely dry. Tissue was powdered with the help of mortar pastle. Lipid was estimated by the Barner`s and Black stock method (1973). The lipid content was very high in the worms as compared to the host. The lipid level in *Gangesia* was 27.30 mg/100 mg ±S.D. whereas 22.80 was in the host *i.e. Clarias batrachus*

Glycogen estimation: To estimate glycogen in cestode as well as in host intestine, the tissue was dried on blotting paper to remove excess water. Material kept at 60°C for 24 hours. The 100 gms of dry material were homogenized in mortal pastle then added 5% TCA to it and was transferred in centrifuge tube. Material was digested in boiling water bath for 15 minutes. Cool and centrifuged for 15 minutes at 2000 rpm. One ml of supernatant was taken in tube and added with 3 ml of sulphuric acid and cooled for 15 minutes. Mixture shaken well, then readings was taken in colorimeter at 530μ.

$$\text{Percentage of glycogen} = \frac{100 \times U}{1.11 \times S}$$

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U = O. D. of the unknown test solution

S = O. D. of the known test solution

1.11 = Conversion factor of glucose to glycogen

$$\text{Percentage of glycogen} = \frac{100 \times 0.45}{1.11 \times 2}$$

= 20.27 mg/100ml of solution.

The glycogen contain in host tissue was 20.27 mg/100ml of solution.

CONCLUSION

The results revealed that the percentage of lipid is high in the parasite than their host and also high as compared to glycogen and protein. Cestodes are depends upon the host for the lipid source. Results indicate that distinctiveness host parasite relationship.

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CORRELATION AQUATIC INSECT BIODIVERSITY AND WATER QUALITY PARAMETERS OF SELECTD WATERBODIES MAHARASHTRA INDIA

Abdar R. N. and Nimbalkar R. K.[1]
Department of Zoology, Smt. Shanabai Kantilal Gandhi Art's, Amolak Science, and Panalal Hiralal Commerce, College Kada Tal, Ashti Dist., Beed (M. S.)
[1]Department of Zoology, R. B. Attal Arts, Science and Commerce College, Georai, Dist. Beed (M. S.)
rknimbalkar@gmail.com

ABSTRACT
The water, a universal solvent occupies the first place in the priority list of the life on our planet, the earth. About seventy one percent of water surfaces covered with water. The water spread area in India is about 4.5 million hectors. The major habitats in fresh water include the lotic bodies (Rivers and streams), lentic bodies (Ponds and lakes) ground water zones and of ecotonal water bodies where aquatic habitats meet. (Palmer et. al. 1997) Manmade lakes and reservoirs are becoming very important water resources throughout the world because of the primary concern of man were thought to be for meeting his basic food requirements. The fresh water aquatic insects inhabit reservoir, streams, and lakes reservoirs. The insects are the most diversified group and plays and major role in lentic as well as lotic food chain of fishes. Biodiversity of insects and physicochemical water quality parameters have close correlation, other animals such as birds insects are also being the indicators of water quality human interference water pollution of the water bodies.

The present investigation was done during June 2017 to May 2018. The four sampling sites were selected for the sampling water of physico chemical parameters from water bodies showed correlations among different factors such as Temperature, Transparency, pH, Dissolved oxygen (DO), Free Carbon dioxide, Hardness, with aquatic insects. The aquatic insects nets of various sizes for collecting aquatic insects. Total 2276 aquatic insects were collected during the study time belongs to 5 orders and 14 families.

Keywords: *Water quality parameters correlation Aquatic Insect, Diversity, Selected Fresh Water Bodies Maharashtra India.*

INTRODUCTION
The considerable limnological investigations are carried out on manmade impoundment. In India workers like Sharma Rekha (1990), Pandey et.al.(1993), Sexena M.M. (1982) Shreenivasan (1974) Krishnamurti (1965) have done some hydro biological work a shallow water bodies in south India. A few like David et. al (1969) have worked on the large brackish water lakes and reservoir. Shreenivasan (1962-1974) reported a detailed account on the productivity of tropical waters of Tamilnadu. In recent studies on hydrobiology of the fresh water lentic habitats about its physico-Chemical characteristics and their productivity is well studied by Trivedy P.K. Goel (1988) Patil et. al (2002) Lendhe et al (2004) Ramakrishna (2002). Sakhare V.B et.al (2003), Chavan and Mohekar (2000) etc.

Insect surpasses all other both in number of their ecological distribution. They undergo an adaptive radiation for aerial, aquatic, terrestrial, and parasitic environment with every considerable ecological niche. Man and Insects have been at war for the same food and same place to live. They attack man and his domestic animals by causing disease, they destroy his property and his crop hence they are very great importance to human. Insects are dominating animals in the world .they occur all over the globe from Antarctica to the tropics ,in air, in water even in deep sea, on land even in deserts, in caves and on the mountains. In terms of mega biodiversity India is ranked 9th position in world (Mittermeier & Mittermeier, 1997). Aquatic insects show a multitude of cleaver refinements. Almost all the more important orders of insects are represented in the wet elements. Only a few species spend their lives uninterruptedly in water. Some live out of water only as pupae. But major pass through their developmental stages in water and adult respire in air .The water quality is also dependent on the bioindication presence and absence of insects in the water bodies. For assessing water quality some insects in the water bodies either it is polluted or non-polluted. The structure of aquatic insect's community is related with many factors i.e. quality of waters, turbidity of waters, sedimentation of water, availability of oxygen, organic matters (Ward D., Holmes N. and Jose P 1995) also surrounding environmental conditions because it affects the insects life. Water samples were collected at monthly intervals from sampling stations in black plastic cans of 2 liters Capacity for analyzing the physicochemical parameters of water.The present investigation was done during June 2017 to May 2018. The four sampling sites were selected for the sampling of water with aquatic insect nets of various sizes. Total 748/697 aquatic insects were collected during the study time belongs to 6 orders and 15 families.

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MATERIALS AND METHOD

Four sampling stations were selected. Water samples were collected at monthly intervals from sampling stations in black plastic cans of 2 liters Capacity. The parameters such as Temperature, P^H, Transparency OD and free Co_2 of water sample were recorded at the sites, while remaining parameters were analyzed in the laboratory by using standard methods given by different agencies and scientists for the examinations of the water, sewage and industrial wastes (APHA-1985), Trivedy and Goel (1984). IAABA - Hyderabad (1998) etc.

The entomofauna related with Limnological studies is poorly documented from the areas so far in India. The early workers Sharma and Rai (1991),Thirumalai (1999), Sivaramakrishnan (2005) ,Dinakaran and Anbalagan(2007).The present study is carried out the abundance and aims to identify the common entomofauna around such important water bodies.

The water samples were collected for entomofauna during the month of during June 2017 to May 2018 early morning 6.30 am to 9.30 am of local time from the five corners of the dam by dipping the insect collecting standard pond net (standard-WP2pattern) with mesh size is 60 µm in the water. Samples were collected and preserved in absolute alcohols on fields. Some insect identified at sites where as samples brought to the laboratory, Zoology Department and observed under Stereo zoom microscope (Carl Zeiss, Stemi DV4) identified the specimen by using standard taxonomic literature key.

RESULTS AND DISCUSSION

(The physico-chemical parameters exhibited seasonal variations in all the four stations. **Table No 1) (Table 2:** Species and relative abundance of aquatic insects recorded during Study Period.) Present investigation ambient temperature of water reservoir ranged between 15.5 ^{0}C to 30.20^{0}C. The minimum water temperature was recorded in the month of January and maximum to April. The water temperature during winter months ranged between 15.5 ^{0}C to 22.00^{0}C as against the summer temperature 27.50^{0}C to 30.20^{0}C Temperature exhibited significant negative correlation with DO and free Co_2 and significant positive correlation with silicate and phosphate content of water.

The P^H ranged from 8.20 and 7.5. The P^H, of water was not constant throughout the year, it changes. There is no definite correlation was seen between P^H and other physico-chemical parameters.

The total dissolved solids (TDS) fluctuated between 180 mg/l. in the month of November and 600 mg/l. during July. During rainy season i.e. July to September the total dissolved solids showed maximum value i.e. with a peak during August.

The dissolved oxygen in the water throughout year, least was recorded (5.00 mg/l.). However maximum dissolved oxygen was seen during winter mouths i.e. October of the end of January (8.2 mg/l.). Dissolved oxygen exhibited moderately significant negative correlation with temperature, P^H

Water bodies were moderately alkaline throughout the year. The phenolphthalein alkalinity ranged between49.02 mg/l. and 31.00 mg/l. The Phenolphthalein alkalinity was above 49. 02 mg/l. During winter months.

The Water bodies were moderately alkaline throughout the year. Total alkalinity was ranged between 84.00 to 198 mg/l. in year .There was two peaks one was summer the Water bodies were moderately hard throughout period of investigation.

The Calcium hardness ranged between 51.44 mg/l. and 45.44 mg/l. and magnesium hardness with minima 17.33 mg/l and maxima 22.30 mg/l. The total hardness showed maximum values during December (155 mg/l.) and minimum values during July

The family wise data of insect diversity, Libellulidae is more than seven species is the most dominating family during the study time, Nepidae 4 species 20.45 % of the total is the most dominating family, Culicidae 13.09 % second dominating family. Libellulidae 10.80 % and 7 species 23.33% of the total species, Hydrphilidae 3 species, Corixidae 14.75 % of the total and 2 species, Belostomatidae 2 species, Coenagrionidae 2 species, Dytiscidae 4 species, Lampyridae single species, Mesoveliidae one species, Notonectidae Tipulidae,, Chironomidae, Nemouridae and one species respectively.

Fig-1: Showing monthly diversity of aquatic entomofauna during study period

Sr. No.	Water parameters	June 2017	July. 2017	Aug. 2017	Sept. 2017	Oct. 2017	Nov. 2017	Dec. 2017	Jan. 2018	Feb. 2018	Mar. 2018	Apr. 2018	May 2018
1	**Temperature**	30.20	29.20	27.60	23.20	23.30	20.30	16.18	14.30	22.00	27.50	31.60	31.30
2	**(TDS)**	700	800	800	700	600	600	650	700	500	600	500	800
3	**Transparency**	43.30	32.25	43.25	46.50	68.25	94.00	84.62	91.87	74.00	65.37	52.12	51.20

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4	**Turbidity**	38.00	35.00	60.00	53.00	40.00	56.00	45.00	35.00	33.00	38.00	53.00	70.00
6	**PH**	7.90	7.50	8.00	8.00	8.20	8.00	7.90	7.80	7.80	8.20	7.90	7.80
7	**Dissolved Oxygen**	5.95	5.85	5.49	7.14	8.00	8.62	8.87	8.90	7.26	7.12	5.73	5.60
8	**Free Co2**	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.80	3.95
10	**Total Alkalinity**	112.25	103.75	100.3	97.00	120.00	100.00	215.0	167.50	108.75	125.70	110.2	131.20
12	**Total Hardness**	123.40	120.20	122.20	134.3	136.00	144.10	150.0	144.00	143.00	138.00	134.8	130.00
15	**Phosphates**	0.08	0.06	0.08	0.10	0.16	0.12	0.13	0.22	0.23	0.27	0.20	0.11
16	**Nitrates**	0.22	0.26	0.36	0.35	0.32	0.13	0.10	0.20	0.17	0.15	0.12	0.14

Fig-2: Showing correlation between aquatic insects taxa and physicochemical Parameters variations.

Order/ Month	Family	Jun. 2017	July. 2017	Aug. 2017	Sept. 2017	Oct. 2017	Nov. 2017	Dec. 2017	Jan. 2018	Feb. 2018	Mar 2018	Apr. 2018	May 2018	Total Count
Odonata	Coenagrionidae	4	3	1	2	1	2	4	4	2	1	1	6	**31**
	Libellulidae	15	16	13	20	24	30	29	30	27	20	15	23	**262**
Coleoptera	Dytiscidae	13	20	22	27	30	38	37	24	25	21	25	20	**302**
	Hydrphilidae	11	12	10	11	14	32	28	22	20	17	14	20	**211**
	Lampyridae	0	0	0	0	1	09	11	1	0	0	0	0	**22**
Hemiptera	Belostomatidae	9	7	8	3	24	56	36	22	21	41	10	9	**246**
	Corixidae	13	15	22	21	26	39	44	45	32	12	20	19	**308**
	Mesoveliidae	3	7	4	6	8	13	10	11	9	8	7	6	**92**
	Notonectidae	10	14	9	7	15	20	22	19	10	9	11	10	**156**
	Nepidae	11	9	5	13	18	22	20	13	17	7	3	4	**142**
Diptera	Culicidae	13	22	15	45	36	13	15	11	25	44	46	54	**339**
	Tipulidae	0	2	6	2	5	13	12	11	9	2	5	1	**68**
	Chironomidae	0	0	4	7	5	9	10	13	6	7	3	5	**69**
Plecoptera	Nemouridae	0	0	0	6	7	3	4	6	1	0	0	1	**28**
Total Insect Count/ Month		**102**	**127**	**119**	**170**	**214**	**299**	**282**	**232**	**204**	**189**	**160**	**178**	**2276**

CONCLUSIONS

Insect diversity of aquatic habitat is significantly high 2276 insects collected during study period as in comparisons of other lentic insect inhibiting places. About 30 species of aquatic insects identified from the water bodies, are directly or indirectly plays major role in to maintain the aquatic food chain in same water dam. The dominance of insect species showed the less pollution of the water bodies. So far within short of the study there is less data available on the aquatic insects distributed in in the lentic water bodies; there for true number of species estimated from the water bodies might be different. The presences of insects were higher during the thought the study periods but during monsoon it goes on increasing, decreasing number during dry period. The total alkalinity along with oxygen dissolved in water is close correlated with aquatic inset diversity. Alkalinity showed negative correlation with the diversity of insects. The family Mesoveliidae, Chironomidae more correlated with water alkalinity and Baetidae, Coenagrionidae, Hydrophilidae, Helotrephidae is correlated with amount of dissolved oxygen in the water.

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ADMINISTRATIVE REFORMS: SYSTEM APPROACH

Helambe H.B.
Department of Public Administration, R. B. Attal College, Georai, Beed (M. S.)
helambe.hanmant@gmail.com

ABSTRACT
The reforms proposed to alter administration to management, shifting the focus from inputs to outputs and outcomes. System components affect its functioning and what interventions can lead to better results. System thinking help understand how systems are structured and how they operate. Administrative reforms the performance of civil service, and above all emphasizes the need for adopting the systems approach.

Keywords: *Administrative Reform, System approach, Importance Variables/components- Inputs, Environment, Conversion, outputs, feedback.*

INTRODUCTION

A well organised and effective Administrative system is essential for proper working of government in any modern state. Public administration reform, aiming at good governance and modernisation of the original, while its implementation different from country to country. Administrative reforms are the special efforts of reform, innovation in the public administration system. Through administrative reforms, the administration helps in becoming people oriented, efficient, ethical and credible. In order to improve the publicity and quality of the services, all the streams of the society, along with the development of the nation, are brought to the development process. Administrative reform is a part of the universality of this change, for administration is nothing but a sub-culture, a social sub-system reflecting the values of the wider society. It also gives priority to change in the structure and structure of the government organization. "Administrative reform is a process that has a fixed order. Because it is a continuous process of realization of the real and changing conditions and administration system, the nature of reforms, evaluation methods, acceptance and execution". In any system the quality of public administration is the key determinant of outcomes. After all quality is not a constant and accident, it is a chain of successive efforts and it is applicable in public Administration. It also facilitates complicated work and action under administrative reforms and the use of minimal money and human power can be used to find out the outcomes / methods of achieving the result or goal.

After the Second World War, an approach has been made in the form of social science knowledge gathering process. It has seen the organization as an arrangement. In general, the system is conceptualized and it is said that the whole body of a beast is an arrangement. Many sub-systems, and other factors, influence the system. Similarly, the administrative organization is an arrangement. 'The system approach explain how Administrative activity co-ordinate with system and subsystem interact. The approach views Administrative system and interaction among various parts. This approach also analyses the dynamic interaction between an administrative system and it's external environments. The execution of public laws require that the core elements of system theory which are inputs, processes, outputs and feedback are promoting functions as the activities of the system affect the entire government's.[1'] All organizations are studied from the system of view. Every system of public administration is considered as a perfect system. This system is transformed by governmental organizations, demands, legal provisions, acceptance of all and in the form of Administration, all by adopting various administrative arrangements. Through this system of transformation, there is the motivation and strength to stay in the related administrative system. Outputs are achieved through the result of social development and nation development work. That is to say, socio-economic development takes place through outputs. Further, new questions and demands are provided by the State Representative in the form of inputs as an administrative system through Feedback. "To strengthen public sector administrative and managerial capacity-building, in particular in developing countries and countries in economic transition[2]".

OBJECTIVE OF RESEARCH ARTICLE:

To study the relation between Administrative Reform and system approach.

Administrative Reform from System Approach

Administrative reform literature is not new. Gerald E. Caiden said that the system approach is primarily chosen to improve. This theory is not known as a system of administration in administrative reforms, but it is known as an approach to focus on administrative reform process by analysing the performance of administrative systems[3].

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Importance Variables related to the System of Administrative reform

It can be said that the government's initiatives are initiated by the government's approach to administrative reforms from the system's perspective as a driving force in a particular environment. Effectively and effective targets can be achieved in connection with system restructuring. Changes in Public Administration, Public Bureaucracy, Legislatures and Judiciary are also important. As a result of administrative reforms in any system, some outputs are created and due to environmental impact, changes in the form of administrative arrangements with the help of inputs are made. The important components related to administrative reforms / systems are as follows:

Inputs:- The process provided in the administrative reforms plays an important role. The content includes factors such as information, demands / needs, legalization and funding. The nature of the administrative arrangement or the demand of citizens, donors or pressure groups is the first inputs for any reform efforts. Apart from this, administrative reforms can not be done. There is also a need for administrative reforms in governmental efforts. In addition, in the administrative work, the person / committee / commission has sufficient authority to enter the administration. Only if they have the right, they will try to improve the administrative system. In some countries, information is provided for improvement. Government problem can not be recommended for administrative arrangements without its nature information. To achieve the goal of administrative reforms, we have to collect and analyse information. Because the usefulness of the recommendations is related to the inclusion of payment information. The efforts of the whole correction are encouraged by providing basic infrastructure and facilities through funding[4].

Environment: - Environment has a very important role in the administrative system. Which also executes administrative reforms along with the recommendations. Socio-economic systems, culture, global perspectives, historical heritage, pressure groups, international relations, which continue to work on administrative reform efforts to achieve the results. Administrative reforms and people's governance are related to the same environment in which nature is a symbol of communication between different ideologies and government relations. The emergence of environmental bureaucracy of developing countries, weak political institutions, culture, imbalance between different branches of government, economic backwardness, and all these problems hinder the efforts of administrative reforms in developing countries[5].

Conversion/ transformation process:- The transformation process of administrative reforms is the creation of inputs. Such as goals, organizations, structures, processes, manpower and obstacles in the process. The objective of administrative reforms from a wider perspective is to reduce the crisis in the existing administrative system or make it more effective and efficient to ensure national development. In this way, changes in the form of administrative organizations, rights, manpower will be brought about. Yet the limitations in these administrative reform efforts are omnipresent. The lack of co-ordination and lack of political will, which suggests improvement and amendment, shows that administrative reforms in developing countries are not effective[6].

Outputs:-The socio-economic development due to the process followed by the inputs and subsequent implementation of it and the solution of the problems are in the outputs.

Feedbacks:- Continuous process of improvement in the continuity of the administrative system and environment changes, shows the existence of the organization. This is ensured through an effective feedback mechanism. Information about interaction and ecosystem interaction is provided by the environment, which helps in effective future changes.

Administrative improvements can be better understood from system perspective, because the actions of all the related issues related to reform are clear. The convenience / compatibility of this approach is entirely included in the updated process, environment and administrative arrangements. Punit Arora or senior bureaucrats, according to the 'Administrative Reforms in India: Need for System Approach to Problem-Solving', proposed that changes in the problems and bureaucrats in the Indian administration and adopting system theory for comprehensive reforms were needed[6]. The administrative arrangements and the mechanisms of balancing the different mechanisms approach the system.

In short we can say this approach might not lead to a solution of all Administrative problems but it surely helps to generate awareness of the limitation and weakness of formal Administration in tackling program of social and behaviral change and systematic functioning.

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DEVELOPMENT OF ADMINISTRATIVE REFORMS

Helambe H. B.
Department of Public Administration, R. B. Attal College, Georai, Dist., Beed (M. S.)
helambe.hanmant@gmail.com

ABSTRACT
Administrative reform is continuous process. After Second World War reform in progress but in management in private sector. When the managerial reforms successful then these reforms adopted in administrative system and tried to Administrative reforms. In the historical period some study and attempts of administrative reform is important to develop the approach of reforms. In this paper I discussed these attempts of reform.

Keywords: *Development of administrative reform, Cameralist, Classical Management, Hawthorne Experiment.*

INTRODUCTION

Any administration is not perfect, that means reform is an opportunity. Changes in the situation, the expectation of the citizens and the enlightenment in the technology are expected to change in the administration system. After the Second World War, many nations in the world have seen systematically and organized efforts to improve the administrative efficiency of the developing nation. But the development of reforms was first developed through the private sector. Then, in order to improve administrative management, organization and procedures, efforts were made to improve the public administration in the last decade of the 19th century. But prior to this, administrative reforms were first attempted by the Cameralist Group around 1700 AD.

Many thinkers have tried for administrative reforms. Under this, Jean Rudolf Perone (1708-1794) of France, studied alpine production system, Charles Babbes (1792 - 1871) in England discovered the computer with the basis of 'differential engine'[1]. Then Frederick Taylor, Henry Lawrence, Henry Feel, George Elton Mayo's contribution is an inspiration for managerial reforms. The management reforms have been adopted in administrative reforms under public administration. Three studies are important in the development of administrative reforms. Cameralist, Classical Management, Hawthorne Experiment.

Study of Cameralist Group and Administrative Reform:

Cameralist the first group of scholars or administrators who have shown interest in the systematic study in the academic study. In the 17th century, some German scholars developed the development of Cameralist. The famous scholar of this group George Zinke has written several texts on Cameralist. Prosperity is possible when this group increases the productivity in terms of efficiency and management. Good governance is necessary in the context of nation and government. In addition, the management has seen the management as a livelihood resource. It is mentioned that excellent management of the management should help in the work of the state. German scholars, through a deep study of state financial system, suggested important measures for financial administration.[2] These German scholars are known as 'State Finance Expert Groups'.

Scientific management and Administrative reform

The contribution of American thinker Frederick Winslow Taylor, who thought about the management of classical management in administrative reforms, is important. Frederick Taylor demonstrated classical management theory by studying the struggles of the labor and owners category, the effective use of the production material, and the planning. Taylor emphasized on adopting a classical method rather than traditional production and methodology. He emphasized on the development of the method of getting more benefits in the least cost through scientific management theory. Developing the work methods and giving staff the importance of scientific / scientific method, as well as establishing a good relationship between staff and management. In addition, it has suggested remedies for improving the procedure through time and speed studies. Also emphasize the need for mental revolution to establish good relations in management. Firstly, the scientific management and productivity of the classical management, after accepting the human view, proved to be a good business practice with the workers / workers, and gave importance to the division of work through functional foremanship[3].

Hawthorne Experiment and Administrative reform

Hawthorne Experiment is an inspiration for human thought ideology. Through this experiment man is not only financially human but otherwise he influences the organization's informal group, methodology and productivity. Hawthorne is used by Alton Mayo and his colleagues. Experiment gives importance to focusing on the mental and behavioural aspects of human resource rather than the use of theory, scientific and mechanical techniques, to increase administrative efficiency and organizational effectiveness. The organization is considered to be a

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social system in the informal organization. As well as motivating and optimizing man's social relationships for transforming products, change in supervision method is more important than physical situation. These human relationships have been the basis of the staff management policy. After that, the practice started.

Public Administration Reform (PAR) has historically been a core area for UNDP support. Today, UNDP supports 380 projects in 112 countries, covering various aspects of PAR. Paradoxically, it is also very difficult to define a UNDP role compatible with its resources. Moreover, a number of other players have increased their role in this field. This has led UNDP to question and reorient its strategic position. This policy note takes the view that democratic governance is a key component in achieving the Millennium Development Goals.

In brief, the contributions of the three study groups are important in the development of administrative reforms. The government of the developed and developing nations has adopted reforms in the public administration by understanding the importance of administrative issues of efficiency and productivity. Although administrative reforms have been largely effective in developing nations, the developing nations have given priority to bringing widespread improvement in our administrative system. In India, there is a great deal of improvement in the ancient times, the British era. However, after independence, the government of India first appointed several committee of committees for the reform of the administrative divisions, improving the efficiency of the public sector, the efficiency of the public sector, the performance of the public sector, the economic reforms. Through that, he has tried to improve the sector. The first Administrative Reform Commission was appointed in 1966 to bring about a comprehensive amendment to the Indian administration. After that, it is seen that the appointment of committees for the disposal of administrative system is seen. After globalization, many new administrative mechanisms had been appointed by the government of India in 2005 for the creation of better administration by administering management principles in the administration system. Apart from this, institutions and organizations from the international level, such as the UNO, the World Bank, Asian Development Bank, mentioned that every nation should give importance to improving the administration of our country. After the 1980s, the concept of novels management, e-governance, civil union administration, moral administration, good governance. Through administrative reforms have been encouraged**.**

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SOUNDS OF ENGLISH AND PHONETIC TRANSCRIPTION

Jadhav A. M.
Department of English, R. B. Attal College, Georai, Dist. Beed (M. S.)
arunj1984@gmail.com

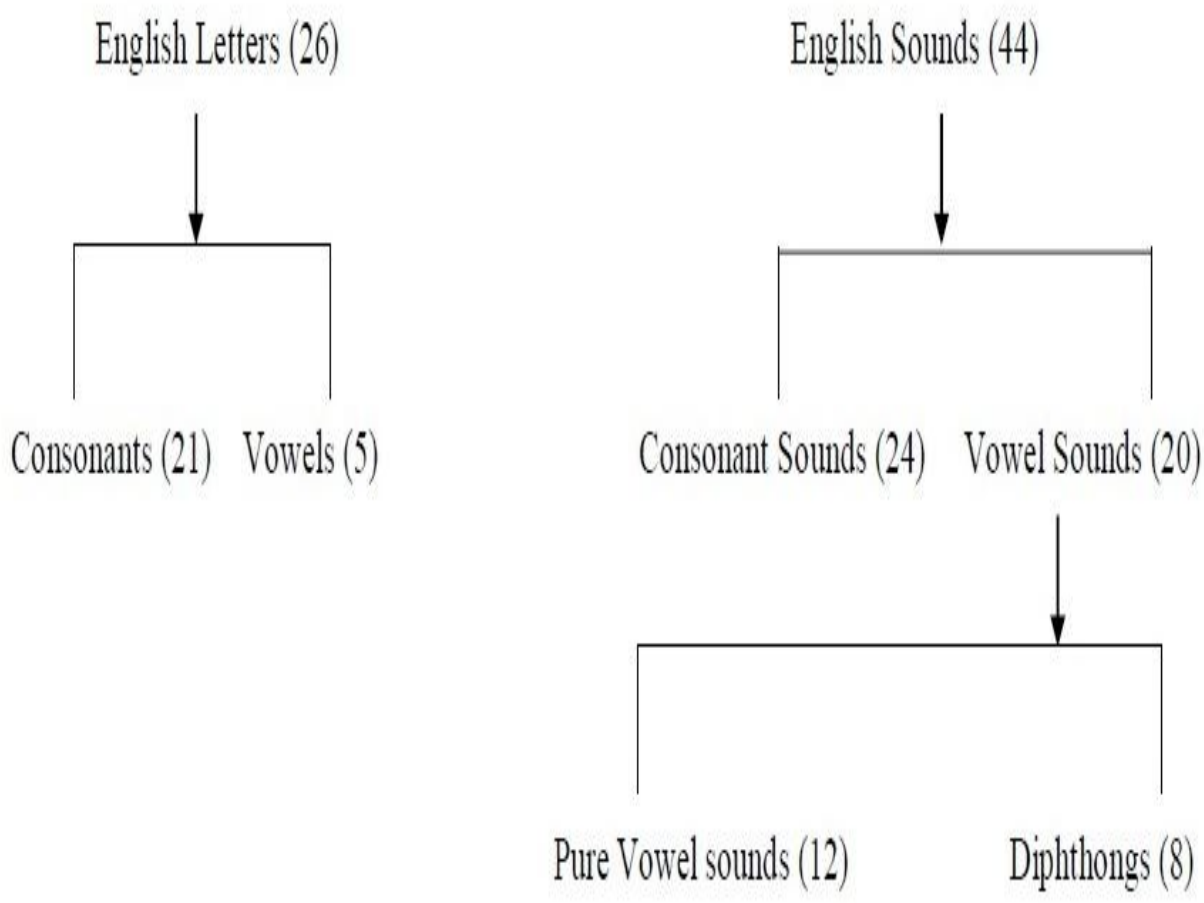
ABSTRACT

English language is an interesting language. In English language there are 26 letters and 44 sounds. In Marathi or Hindi there is no such difference between number of letters and sounds. In Marathi language pronunciation of 'k' is /k/ but in English language the pronunciations of C letter are /ts/ and /k/ ex: In the word 'church' it pronounced as /ts/ but in the word 'cut' it pronounced as /k/. The learner of English language has been facing the same problem. We used to divide the 26 letters as twenty one consonants and five vowels i.e a, e, i, o, u. But these letters represent forty four sounds.

Keywords: *Symbols, Diphthongs, Received Pronunciation*

INTRODUCTION

English language has 44 sounds or Phonetic symbols. Before we deal with these sounds let us study why we use the sounds. In English language there is no one to on correspondence between letters and the sounds they produce. Some letters of alphabets carries two sounds. For instance the 'U' letter represents two sounds. If we use 'U' in 'cut' its pronunciation is /ʌ/ but when we use it 'put' its pronunciation is /u/. The five English vowels represent twenty vowel sounds and twenty one consonants represent twenty four consonant sounds. Therefore, it is necessary to learn IPA symbols or sounds. These sounds broadly divided into two types Consonant sounds and Vowel sounds. There are 20 Vowel sounds in English. In the production of vowels sounds there is no narrowing in the mouth cavity. Vowels sounds also divided into two types Pure Vowel Sounds and Diphthongs. Diphthongs are produced when there is a smooth move from one vowel to another within the same syllable. There are 24 Consonant sounds in English. In the production of consonant sounds there is closure in the mouth cavity.



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The Forty Four Sounds of English

iː READ	ɪ SIT	ʊ BOOK	uː TOO	ɪə HERE	eɪ DAY	John & Sarah Free Materials 1996
e MEN	ə AMERICA	ɜː WORD	ɔː SORT	ʊə TOUR	ɔɪ BOY	əʊ GO
æ CAT	ʌ BUT	ɑː PART	ɒ NOT	eə WEAR	ɑɪ MY	ɑʊ HOW

p PIG	b BED	t TIME	d DO	ʧ CHURCH	ʤ JUDGE	k KILO	g GO
f FIVE	v VERY	θ THINK	ð THE	s SIX	z ZOO	ʃ SHORT	ʒ CASUAL
m MILK	n NO	ŋ SING	h HELLO	l LIVE	r READ	w WINDOW	j YES

(https://www.youtube.com/watch?v=JwTDPu2TE6k)

Phonetic Transcription

Phonetic Transcription deals with actual pronunciation of a particular English word. In English language letter does not always correspond with sound. For instance 'a' can represent different sounds /e**ɪ**/, /æ/, /ʌ. For identification of sounds IPA (International Phonetic Alphabets) are used .The above mentioned symbols are used in phonetic transcription of words. Phonetic transcriptions of some words:

Word	Phonetic Transcription	Word	Phonetic Transcription
gain	/gem/	yard	/ja:d/
find	/faind/	map	/mæp/
light	/laɪt/	cut	/kʌt/
spoon	/spu:n/	dean	/di:n/
zoo	/zu:/	yes	/jes/
bad	/bæd/	heat	/hi:t/
saw	/sɔ:/	west	/west/
three	/ɵri:/	leisure	/leʒə/
lost	/lɒst/	finger	/fɪŋgə/
girl	/gɜ:l/	two	/tu:/

In short we discussed about sounds of English and their use in Phonetic Transcription. While looking The Oxford Advanced Learner's Dictionary we come across such symbols. These symbols help to the learner of English language about actual pronunciation of English word. The people of Maharashtra consider Marathi language of Pune city as standard language. The pronunciation is Received Pronunciation (RP) for the people of the state. Likewise if we study and use the above symbols while pronouncing English words definitely our pronunciation would be standard or received.

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UNIVERSALITY IN RABINDRANATH TAGORE'S WHERE THE MIND IS WITHOUT FEAR

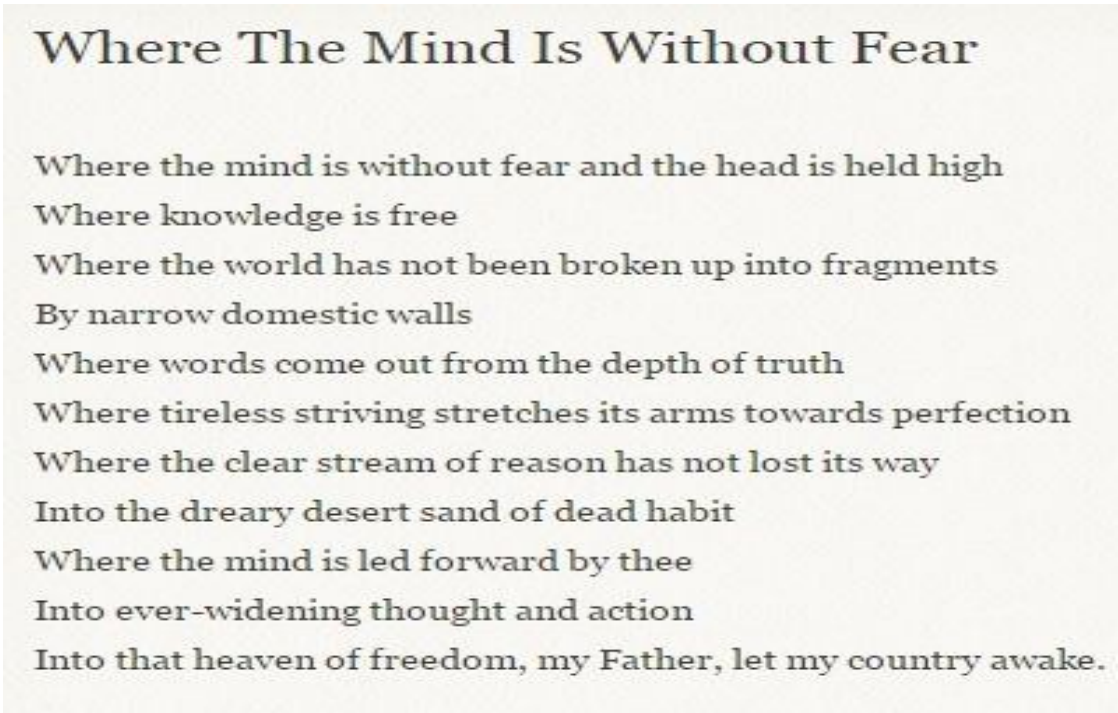
Jadhav A. M.
Department of English, R. B. Attal College, Georai, Dist. Beed (M. S.)
arunj1984@gmail.com

ABSTRACT
Where the Mind is without Fear is a beautiful composition of Rabindranath Tagore. Though the poem is written for India and Indian people but the poem has universal message for humankind. All his expectations are for humankind.

Keywords: *humankind, freedom, reason*

INTRODUCTION

Rabindranath Tagore was a philosopher, a nation builder, a poet, a dramatist, a novelist and a short story writer, a translator. He was the first non European to win Nobel Prize for his rendered work *Gitanjali* in 1913. *Where the mind is without Fear* is a beautiful composition of Rabindranath Tagore. 'The Heaven of Freedom' is another title for this poem. This poem is most anthologized poem in Indian Literature. It is a prayer for India and Indian People. Though it is written for India and Indian People but it has a universal touch.



Where The Mind Is Without Fear

Where the mind is without fear and the head is held high
Where knowledge is free
Where the world has not been broken up into fragments
By narrow domestic walls
Where words come out from the depth of truth
Where tireless striving stretches its arms towards perfection
Where the clear stream of reason has not lost its way
Into the dreary desert sand of dead habit
Where the mind is led forward by thee
Into ever-widening thought and action
Into that heaven of freedom, my Father, let my country awake.

*https://www.google.co.in

Universality in the Poem

In this poem Rabindranath Tagore expecting fearless mind for him head should be held high. There should be self respect and pride in one's freedom. He also expects that knowledge should be free for everyone. In old days it was monopoly of a particular community. *Shudras* (people belong to low category) and female were not allowed to take education in India. The treatment given to Negro was the same in America. These people were lost their self respect. They were deprived of education.

Through the fourth and sixth lines he expects the world without narrow domestic walls. These walls may be walls of caste, religion, race, states, language, country etc. He also expects that every word we speak should come out from depth of truth. This message reminds our father of nation, Mahatma Gandhi and his autobiography *My Experience with Truth*. Everyone, he may be Indian, American, British etc should not utter untruth.

Rabindranath Tagore longs that the constant efforts of human being should lead towards perfection. Only human being can create beautiful things out of his imagination. His/her efforts should lead towards creativity. He has both creative and destructive energy. He should utilize the first energy for the innovation, and creativity.

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In the next two lines he is worried about the stream of reason. While studying world history we notice that dead habits, superstitions used to harm reasonable thinking. He wished that the desert of these dead habits should not hinder the stream of reason. The stream of reason should not lose its way means reasonable thinking of the human being should live forever.

At last Tagore prays to God that He should lead the mind of human being into ever-widening thought and action. Everything that is produced in the world is a result of someone's thought. All above expectations of Rabindranath Tagore will create heaven of freedom. He also prays to God that He should awake Indian people from the darkness of slavery, discrimination, superstitions. Broadly speaking human being should awake and create beautiful world out of his thought and action. The world would be heaven of freedom.

CONCLUSION

By and large, *Where the Mind is without Fear* is vastly discussed poem in Indian English Literature. The freedom of education, expression of truth and reasonable thoughts, and creativity etc will lead towards perfect human life. He is expecting paradise on the earth not in the sky. Basically the poem or prayer is for the India and Indian people but it has universal message for the humankind.

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THE ROLE OF RAMCHANDRA PANT AMATYA IN THE FREEDOM STRUGGLE OF MARATHA

Jirewad L. M.
Department of History, R. B. Attal College, Georai, Dist. Beed (M. S.)
drjirewadlm@gmail.com

ABSTRACT
RamchandrapantAmatya was about to speak while RamchandrapantAmatya was a sincere Pune Marathashahi period. He rewarded the Sardar and the Sipai with different motivations such as rewards, recommendations, and support from the soldiers and chieftains. Aurangzeb is the Maratha chieftain The army had to adopt the policy of bringing many Maratha chieftains with many vests and military ammunition in order to put a foot in it. RamachandrapantAmatya's heart was burnt overnight worrying about Swarajya and Maharashtra religion. The self-styled Mavals, who took the name of ShivajiMaharaj, have to remember the fascinating history of the Ramachandra Pandits, the RamachandrapantAmatis who have given life to life for Swarajya. Thus, the role of RamchandrapantAmatya in the Maratha State system has been highlighted in several aspects related to the life of RamchandrapantAmatya. If RamchandrapantAmatya's role is a brilliant boon to the Marathashahi, then I do not think that this will be the case.

Keywords: *Maratheshahi, Ramchandra Pant, Role of Amatya.*

INTRODUCTION

Ramchandra Pant Amatan's contributions to the independence of Maratha are immensely. It is revealed in the works of the uncles of Najana, how to protect Maharashtra from the Mughals, along with everyone in extreme adverse circumstances. After the death of Shivaji Maharaj, Aurangzeb came with a large phase crossing in the south. At this time Sambhaji Maharaj had brought great blessings and courage with the great Mughal emperor Aurangzeb. Sambhaji Maharaj was suddenly caught while he was against the slaughter of the people, and after his death, there was no confidence that he would win the Maratha region easily by Aurangzeb's army. But after the demise of Sambhaji Maharaj, Akhkha Maharastra mogla rose to the ground in the real sense of independence war. During this period, many Maratha leaders and ministers played their part in the Maratha independence war, which protected the Mughals from independence founded by Ram Chanderpant Amatya, Prahlad Niraji, Khando Ballal, Santaji Ghorpade, Dhanaji Jadhav, Parashuram Trimbak Representative, Shankarji Narayan, etc. Maratha governor, Chhatrapati Shivaji Maharaj founded. Many Maratha soldiers like Ramchandra Pant Amatya, Dhanaji Jadhav, Santaji Ghorpade, Parasuram Pantprininiidhi, Shankarji Narayan got upset with the Mughals and under the leadership of Rajaram Maharaj, they were ready to fight again with the Mughals. In fact, the freedom fight of Marathas has started. D On 5th April 1689 Rajaram Maharaj went to Pratapgad from Raigad with his wife, leaving the family on a difficult fort, like Vishalgad and Rangana, and started mobilizing the army for two hands with the Mughals. With Rajaram Maharaj, Ramchandra Pant Amatya, Prahlad Niraji, Shankaraji Malhar, along with Pratapgad, went to Pratapgad after seeing that Rajaram Maharaj had stayed on Pratapgad.

Rajaram Maharaj left Pratapgad and turned his front towards Panhalgarh. During this time, the Mughal army captured Pratapgad and went to Panhalgad to catch Rajaram Maharaj, after consulting Ramchandra Pant, Rajaram Maharaj left Panhalgad but left the fort and started to arrange for the future of the war and new army of Maharashtra. During this time, Ramchandra Pant Amat sent Ramchandra Pant Amana to Dhanaji Jadhav and Santaji Ghorpade to persuade the Mughals army to disperse the attention of the Mughals on Panhala and Vishal Gada. When Santaji Ghorpadee exiled the Nizam's army in various places, Ramcharaprint was entrusted with the responsibility of arranging all the forts in Maharashtra when Rajaram Maharaj got the time to go from Panhala to Zanjeer. Ramchandra Pant Amatya was given the book "Hukumat Pahna" when Trimbak was given with help to a clever Brahmin clerk. Ramchandra Pantha took the liberty of joining the Mughal authority with the command of the freedom fighters in the state of Maharashtra for joining the independence movement. Ramchandra Pantha defended Swaraj by calming the hostility that many of the Sardars had in the congregation. RamchandraPant untainted the Mughals by placing the campaign under the control of the Ramchandra Pant, while supporting Rajaram Maharaj. Rajaram Maharaj was involved in the siege of Jinji while opening an expedition against the Mughals. The Ramchandra Pant Amartya's argument was made to rescue the family members of Rajaram Maharaj. The effect of Vasai's army with the help of Santaji Ghorpade and Dhanaji Jadhav was to recover quadrangular and sideways in the Mulukha of the Mughals. Ramchandra, during the freedom struggle of Maratha Pant Amatya did it.

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PROBLEMS AND REMEDIES FOR TRIBAL COMMUNITIES IN GLOBALIZATION

Jirewad L. M.
Department of History, R. B. Attal College, Georai, Dist. Beed (M. S.)
drjirewadlm@gmail.com

INTRODUCTION

Tribal people are basically a tribe living in forested forests of tribal areas. About the Adivasi tribe Birsa Munda is a tribal who is not a resident but also a resident of Indian origin for more than a decade. Dr. Tribal people are called Aboriginal by Vérien Elvin and Thakkar Bappa. This means that Indian origin resides. Calling tribals as forest dwellers or wild castes, it means that their existence is like denial. Adivasi is primitive in English. Primitive means the primitive tribe or the underprivileged. Adivasis, which are far from urban civilization, will be the tribe of indigenous tribe, which have been separated from remote areas. Generally a group of people who are away from the well-cultured community are called Adivasi groups in the forest, in the remote areas of the distressed areas. In Indian memoirs, there is a mention of the tribes of Ramayana, Mahabharata and Adivasi. In this, many tribal groups were divided into tribal groups such as Shabar, Shwas, Nishad, Kirt and Junda. In the Indian society, there has been a great deal of inequality already In order to eliminate the inequality of Indian society, many Indian greats such as Mahatma Jyotiba Phule, Rajarshi Shahu Maharaj, Dr. Babasaheb Ambedkar and Krantisuri Birsa Munda came to the conclusion that the Indian Constitution came into effect in 1950. Under section 342 (1) for the tribals, Indian origin tribes were included in Scheduled Tribes. Is there. With many opinions and opinions of the United Nations organization and its affiliated organization, the International Labor Organization, Babasaheb Ambedkar suggested the use of the term as a scheduled tribe.

Many tribals came to the British against the British to get the British to come to India from India, Birsa Munda, who fought in that time in Bihar, Tanta Bhil, who fought against the British in Madhya Pradesh, Khaja Naik, Ramdas Maharaj, Bhojji Naik, Umaji Naik, fighters in Maharashtra, many tribal revolutionaries like the last blood drop of the body Till the end We have contributed to the independence of India. Some have been sacrificed, some have been hanged on the gallows. Assam, Bihar, Madhya Pradesh, India etc. C. Between 1778 and 1947, tribal groups have called up about 75 rebels against the texts.

* Adivasi place in globalization *

Christian missionaries were forced to convert tribal people into Christianity by destroying the cultures and families of many tribals, while the work of the mission of Dharma was started. Tribal people had a problem ahead because tribals were not able to preserve and conserve them. British imperialist policies have been adopted by the British from many tribal areas and tribals have been made to farm hinds. Due to the tribal habitats being in very remote areas, there is a lack of road due to the lack of roads in the forest due to the advanced society. There are many small groups in the tribal community, they are based on small group relationships. Each group of tribal groups is headed by their leader or panchayat. So there is less chance of meeting with the same fair-minded justice panel or the head. The tribal tribes in different groups have different dialect languages. Tribal society is a self-centered society. Nature worship is more important in the tribal community than acceptance of science age. Overall, all the communities in the world were in the habit of living in the tribal state, and it seems that they should be tribal. The state of the tribal origin was followed by the king of the wild. Businessmen started in big cities and urbanization of the tribals has started. Later, after the Industrial Revolution, the human society started to live in rural and urban areas towards the entire urbanization. With the help of Indian industrialization, large number of tribals were employed in Bihar, West Bengal, Assam, and steel factories. Considering the statistics of the tribal population compared to the countries that are developing countries like the Industrial Revolution, the countries that have globalization, tribal society is still away from the main needs. With the new findings of globalization, progress has been increasing day by day. But tribal society still sees it in the backward state. Even today, for the tribal people, there is no such facility for schools and colleges, because even today tribals have to walk a lot of miles for education. Tribal society is deprived of modern development, equipment, machinery, education, healthcare etc. Apart from the government's policy, tribal organizations and tribal societies from such a social institution have remained neglected from many reforms. There is a community which is separate from social dignity. The assistance of the forest was done to fill the abdominal stomach of the tribal community, but due to the British imperialist policy, the forest has been broken in large numbers. Governance is a society devoted to hunting a tribal society. The government has made a habit of living the lives of the tribals by restricting the hunting and hunting of tribals. For the welfare of the people, there is a need to migrate somewhere else due to lack of alternative.

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Tribal people have not been able to get proper food at the right time due to which the number of malnutrition has increased in tribals in large numbers. Adivasi society has a large number of addiction. Many programs are considered to be a landmark affair for consuming alcohol. Drug addiction is one of the important places in our society. The government feels it is very difficult to implement the measures taken by the tribal community to adversely affect the society which has been suffering from Adarshav community for the tribal people.

SUITABLE TO IMPROVE ADOLESCENT SITUATION

The 21st century is known as the Evergreen century of science and technology, in the revolutionary World era, the Indian society is thinking of living on the moon, while on the other hand the tribal society is dominated by poverty and hunger. Tribal societies still appear to be in the same forest in the same woodland. Today, To the victim, hunting, living in the forest, the Adivasi community second to the other It does not appear to be known either. To bring about the overall development of tribal communities or for the mainstream of the tribal community, it is extremely important to give information to the tribal community about the new concept of globalization, some of the important issues are suggested below.

1) In the annual financial budget of the Central and State Governments, tribals have to provide separate financial budget.
2) In the ratio of tribal population, the central government should provide financial budget for the budget according to the inflation index.
3) The Central Government and the State Government need to reduce the number of malnutrition by adhering to the tribal wards, habitats, villages and schools and providing adequate dietary provision.
4) State Governments and the Central Government have addiction in tribal communities. To remove tribal society from addiction, it is necessary to implement public awareness programs.
5) It is necessary for the tribal people to make available the facilities of tribal society in the form of Polytechnology, Vocational Education, Sports Practice, Exercise School, Business Guidance Camp, Competition Examination Center, etc. to reach the light of knowledge to the tribal people stuck in the vicinity of the backward and backward class.
6) To reduce the level of malnutrition, a comprehensive campaign should be implemented to reach health facilities to tribal communities.
7) Central and state government should give priority to the training of women by setting a program for them. A campaign should be launched so that women should turn to education so that the tribal women are not deprived of education, it is important to take care of them.
8) Employment and employment should be made available in every tribal village to solve the problems of the employment of the Central and State Government.
9) Many constitutional concessions should be made available to the tribals to improve tribal status.
10) It is found that when tribals are on a road to improve the situation, efforts are being made to remove the tribals from the government. The committee should try to give a more concession to the tribal authorities to see if the government and the state government get the benefit of the concession to improve their situation without making such a policy.

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IMPORTANCE OF INVESTMENT FOR THE UPLIFTMENT OF AGRICULTURAL SECTOR

Jogdand B. S.
Department of Economics, R. B. Attal College, Georai, Dist. Beed (M. S.)
balajogdand@gmail.com

ABSTRACT
India has high population pressure on land and other resources to meet its food and development needs. India has made impressive strides on the agricultural front during the last three decades. Much of the credit for this success should go to the several million small farming families that form the backbone of Indian agriculture and economy. Policy support, production strategies, public investment in infrastructure, research and extension for crop, livestock and fisheries have significantly helped to increase food production and its availability.

Keywords: *Agricultural Development, Private and public Investment, Unliftment, GDP Growth, five year plan.*

INTRODUCTION

Growth of agricultural development must be with financial development. The overall economy of the Indian economy will be possible only when the agricultural sector's participation in GDP is high. It is inevitable to achieve the development of the agricultural sector for comprehensive development. To reduce the poverty rate in India, it is necessary to increase the rate of growth of agriculture at least five percent. In addition, there is a need to show the courage to make strategic big decisions in the agricultural sector. Agriculture sector can contribute significantly to the problems of poverty, malnutrition, etc. in the country.

The development of agriculture and the eradication of poverty in rural areas depends on the investment in agriculture. To make Indian farming more comprehensive and inclusive, there is a need to reduce the imbalance between investment in agriculture and grants given to it.

DEVELOPMENT OF AGRICULTURE

Generally, the growth of any sector depends on the investment in that sector, the growth rate of the capital formation. One of the most important roles in speeding up agricultural development is that of total capital formation, which the real investment of public and private sector is generally.

Comparison of Country's Overall GDP and Agricultural GDP Rates During the Plan Period

Sr. No	Duration of Five Year Plan	Agricultural Sector Growth Rate (%)	Total GDP Growth Rate (%)
01	First Five Year Plan	2.71	3.50
02	Second Five Year Plan	3.15	4.21
03	Third Five Year Plan	0.73	2.72
04	Fourth Five Year Plan	2.57	3.20
05	Fifth Five Year Plan	3.28	4.70
06	Sixth Five Year Plan	2.52	5.54
07	Seventh Five Year Plan	3.47	5.60
08	Eighth Five Year Plan	4.72	6.54
09	Ninth Five Year Plan	2.44	5.52
10	Tenth Five Year Plan	2.30	7.74
11	Eleventh Five Year Plan	3.30	7.09
12	Twelfth Five Year Plan	1.60	7.00

Source: CSO: XI Five Year Plan (2007-12) VOI P.25

Looking at the status of the economic reform since 1991, it shows that the average growth rate of agriculture sector in the years 199- 92 to 2013-14 was 3.2 per cent. In the 12th Plan period, the rate of return is lower than the target rate. During the eighth plan period, agriculture growth was 4.7 per cent. The annual growth rate in the Ninth Plan period was lower than 2.4 per cent. In Tenth plan it was 2.3per cent and in Twelfth plan it was 1.6 per cent. From this it is clear that the rate of agricultural growth is less compared to the growth rate. Irrigation facilities and research are required in the agricultural sector to increase the area's growth rate. There is a huge investment requirement for this. When the plan duration was observed, the question arises that, have

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you invested sufficiently? The answer is no. Agricultural sector investments will benefit all those who work in that field. The development of the agricultural sector is impeding the development of the entire economy. Therefore, it is necessary to invest in the agricultural sector for economic development.

Gross Capital Formation in Public & Private Sector in Agriculture About Gross Domestic Product in Agriculture (Rs. Crore)

Year	GDPag	GCFagPU	GCFagPvt	GCFagPU as % of GDPag	GCFagPvt as % of GDPag
1990-91	159293	7301	6932	4.58	4.35
1991-92	167723	7130	6949	4.25	4.14
1992-93	166577	7092	7437	4.26	4.46
1993-94	182498	7196	7529	3.94	4.13
1994-95	185186	6921	8027	3.74	4.33
1995-96	186570	6213	7919	3.33	4.24
1996-97	185363	5864	7844	3.16	4.23
1997-98	182899	6045	8204	3.31	4.49
1998-99	211184	5699	9063	2.70	4.29
1999-00	214315	4972	8452	2.32	3.94
2000-01	223114	4992	11424	2.24	5.12
2001-02	219660	4376	10589	1.99	4.82
2002-03	232386	4539	11602	1.95	4.99
2003-04	211967	4918	10331	2.03	4.27
2004-05	254090	5397	11338	2.12	4.48
2005-06	251892	4849	10841	1.93	4.30
2006-07	276091	4668	11508	1.69	4.17
2007-08	269383	3979	11963	1.48	4.44
2008-09	286094	3870	11025	1.35	3.85
2009-10	286983	4756	13083	1.66	4.56
2010-11	286666	4435	12980	1.55	4.53
2011-12	305263	5488	12250	1.80	4.01
2012-13	283393	4760	13881	1.68	4.90
2013-14	310611	5923	15261	1.91	4.91
2014-15	310486	6051	19668	1.95	6.33
2015-16	329168	6385	22424	1.94	6.81

Source: National Account Statistics, CSO, GOV of INDIA

Private investment in agriculture sector plays an important role in the development of the agricultural sector. That is why private investment is important as much as the public sector's investment. Because private investment is indirectly done for infrastructure, education and training in the agricultural sector. Looking at the above figures it shows that the private sector investment in agriculture has remained after the economic recovery period. As compared to 2005-06, the sector's investment in agriculture is less than two per cent. In contrast, the private sector's investment in agriculture is more than 4.0 per cent, except 2008-09.During 2014-15 to 2015-16 private sector investment is more than 6.0%.

In order to conserve the Indian agriculture, large scale public sector is expected to invest in agriculture. Because the investment made by the private sector is limited. On the other hand, the public sector has more potential to invest in the agriculture sector. We should not see it as a means of livelihood. It is possible to get more returns from the sector if you believe in agriculture sector.

Farmers working in agriculture are a skilled producer. Keeping this approach in view, farmers need to deliver a large number of resources, technology and communication, because agriculture is the only sector where more production is produced.

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IMPACT OF SANT GADGE BABA GRAM SWACHATA ABHIYAN ON DABHA VILLAGE: (WITH SPECIAL REFERENCE TO HEALTH)

Kale R. B.
Department of Sociology, R. B. Attal College, Georai, Dist. Beed (M. S.)
revannathbkale@gmail.com

ABSTRACT
The present research paper is Dabha village represent Aurangabad district of Maharashtra that participated in the campaign. In the village majority of people were unaware about their health before the campaign. The study looks at the achievement of the campaign regarding people health.

Keywords: *Awareness, Health, Hygiene.*

INTRODUCTION
The democratic system in India promises welfare state to the people that includes not only economic and social development but also public health. The public health engages the issues like hygiene and sanitation. The concept of hygiene is related to personal cleanliness like the practices of regular bathing, washing hands before eating and after shaking hands in public etc. However, the concept of sanitation deals with maintaining cleanliness at public places, promising healthy environment to every citizen. It promises safety, security and dignity to human beings at public places regarding their practices of urination and defecation. Now slowly and gradually the central as well as state governments are found applying solid measures in this regard, anticipating good health, better social and best economic environment to the people.

Many times, villages are found racing towards top in the list of epidemics like diarrhea, Cholera, Malaria, Polio etc. It attracts attention towards critical analysis of customs, traditions, practices and awareness of the rustics towards various diseases, hygiene and sanitation. They were observed with many hurdles and prejudices towards cleanliness of drinking water, proper disposal of domestic waste and human muck. The single practice of open defecation at the villages has been observed as the root cause of many natural as well as social hazards, creating risk for the lives of these people. To overcome such situation, the Department of Water Supply and Sanitation, Government of Maharashtra has introduced 'Sant Gadge Baba Gram Swachata Abhiyan' to all the villages in the state from 2000-2001. It invites all the villages, particularly the *Grampanchayats* of these villages to participate in this campaign for cleanliness at village level. It anticipates clean rural Maharashtra, a dream of Sant Gadge Baba. The campaign in formed in the form of competition among the villages to accelerate the villagers for certain awards at village level.

The innovative Campaign surprisingly received good response from most of the villages, reflecting the rustic orientation for public hygiene. Thus, the Government Maharashtra finds the rapid advancement towards phenomenal change at villages. The Government has incorporated it with another icon of cleanliness i.e. Mahatma Gandhi, so that the period for this campaign has been fixed during 2nd October to 17th October. Due to the image of Sant Gadge Baba, the campaign has reached to every corner in each village of Maharashtra, involving every citizen. The campaign rightly attracted their attention towards littered public places and particularly awareness for the need of sanitation.

LITERATURE AND RESEARCH METHDOLOGY
The study was undertaken in Aurangabad district of Maharashtra. There are nine Panchyat Samiti in the district of Aurangabad. These are Panchayat Samiti, Aurangabad, Panchayat Samiti, Sillod, Panchayat Samiti, Vaijapur, Panchayat Samiti, Gangapur, Panchayat Samiti, Paithan, Panchayat Samiti, Phulambri, Panchayat Samiti, Kannad, Panchayat Samiti, Khultabad and Panchayat Samiti, Soygaon. Out of these, Panchyat Samiti, Soygaon and particulalry Dabha village is selected for the present study as it has been awarded for the Sant Gadge Baba Gram Swachata Abhiyan for two times. It has received first prize for 2004-2005 second prize and 2010-2011 first prize in Panchayat level.

As the present paper is based on field survey, the research has seriously engaged with concerned literature, government amendments, primary data, secondary data, questionnaires, interviews, interactions and observations. A Total of 20 respondents were selected purposive sampling method.

OBJECTIVES
- To understand the meaning of Health concept.

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- To understand awareness for health among the rustic people through Sant Gadge Baba Gram Swachata Abhiyan.
- To notice the change about health before and after Sant Gadge Baba Gram Swachata Abhiyan.

DEFINITION OF HEALTH

Health, as defined by the (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[4]

Public Health: "Science and art preventing diseases, prolonging life and promoting mentail and physical health and efficiency through organized community efforts for the sanitation of the environment, the control of communicable infection, the education of the individuals personal hygiene, the organization of medical and nursing services for early diagnosis and preventive treatment of disease, the development of the social machinery to ensure to every individual a standard of living, adequate for the maintenances of health and so organizing these benefits as to enable every citizen to realize his birth right of health and longevity", (WHO, 1952)[5]

INFORMATION IN TABULAR FORM

Table-1: The following table analyzes various answers of the respondents to a key question 'Were the people facing problem regarding health before campaign?'

Were the people facing problem regarding health before campaign**?**			
		Frequency	Percent
Valid	Yes	20	100.0

The above mentioned data clearly indicates that 100 % (20) respondents replied assertively regarding the were the people facing problem regarding health before campaign. The information and analysis lead to the observation that almost all the people were the people facing problem regarding health before campaign. It means all peoples unaware about health.

Table-2: The following table analyzes various answers of the respondents to the subsequent question after answering the above one. The subsequent natural question is 'If yes, which are the causes?'

If yes, which are the causes?			
		Frequency	Percent
Valid	Unclean drinking water	4	20.0
	Lack of personal Hygiene	2	10.0
	Uncleanness	4	20.0
	All	10	50.0
	Total	**20**	**100.0**

The above mentioned data clearly indicates that 20% (4) respondents state that unclean drinking water cause of health problem. Only two respondents stated that lack of personal hygiene, 20% (4) respondents replied that uncleanness was the reason of health problem. 50% (10) respondent's state that unclean drinking water, lack of personal hygiene as well as uncleanness factor affected on health. Thus it reflects that majority of the respondents state that above factor created health problems before the campaign.

Table-3: The following table analyzes various answers of the respondents to another relevant question after answering the above mentioned one. The question is 'Has campaign reduced your health problems?

Has campaign reduced your health problems?			
		Frequency	Percent
Valid	Yes	20	100.0

The above mentioned data clearly indicates that 100% (20) respondents replied that has campaign reduced health problems. It means before the campaign health problems increased but when campaign was implemented that time health problems reduced, but also all peoples aware regarding health and care to prevent health problems after the campaign.

Table-4: The following table analyzes various answers of the respondents to another question after answering the above mentioned one. The question is 'If yes, how?

If yes, how?			
		Frequency	Percent
Valid	Personal hygiene	2	10.0
	Care of drinking water	-	-

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	Use of toilet	4	20.0
	Premises cleanness	4	20.0
	All	10	50.0
	Total	**20**	**100.0**

The above mentioned data clearly indicates that 10% (2) respondents affirmed that they have personal hygiene,20% (4) respondents state that use of toilet, 20% (4) respondents replied that we are care to premise cleanness in this way to prevent health problems. 50% (10) majority of respondents state that personal hygiene, care of drinking water, use of toilet and premises cleanness in this way care to prevent health problem after the campaign. It means aware about health after this campaign and regularly care of health its positive impact of campaign. It reflects that the campaign had created positive impact regarding awareness as well as health.

CONCLUSION

Before the Sant Gadge Baba Gram Swachata Abhiayn mostly rural people unaware regarding health problems. They don't know which causes affected health problems were but when this campaign implemented then aware about health and care to prevent not only individual health problems also public health. The campaign brought out positive changes regarding sanitation among the villagers.

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BIOFUEL FROM MADHUCA LONGIFOLIA: A REVIEW

Madavi B. B.
Department of Physics, R. B. Attal College, Georai, Dist. Beed (M. S.)
bharatmadavi1990@gmail.com

ABSTRACT
Today we all aware about the growing concern of our increasing energy needs. Energy is an essential and important for our life on earth because we mostly depend on it. Our traditional source of energy such as petrol, diesel and natural gas is not adequate and also it creates environmental problems. To meet our increasing energy requirement there has been tremendous increase research in renewable and alternative source of energy which can fulfilled our energy needs. This paper focused on Biofuel which is a type of energy and it create from plant called Madhuca longifolia which mostly present in tribal area of India. Madhuca longifolia is an Indian tropical tree found largely in central and north Indian plains and forest. It is commonly known as 'mahuwa' by native tribal of that region.

Keywords: *Biofuel, Madhuca longifolia, Energy*

INTRODUCTION
Biofuel is a type of fuel which produces from biomass (It is plant or animal material used for energy production). Biofuel have so many forms such as bioethanol(alcohol), renewable crude oil, butanol, biogas and biodiesel. etc. Biofuel are considered as eco-friendly because it emits less carbon dioxide than fossil fuel. Eco friendly fuel is today's need to reduce the greenhouse effect which create problem like global warming. Hence biofuel will be best replacement over our traditional fuel such as petrol, diesel and natural gas etc. the term Biofuel is usually used to reference liquid fuel such as Ethanol and Biodiesel. Ethanol is formed by fermentation process and it can be used as gasoline. On the other hand, Biodiesel formed by transesterification process. Biofuel produced from the plant Madhuca longifolia comes under the category of Ethanol fuel. The process by which ethanol produced from plant Madhuca longifolia is known as fermentation. This a metabolic process in which an organism convert carbohydrate such as sugar or starch into an alcohol or an acid. Ethanol as the name indicate that it contains alcohol. Madhuca longifolia is an Indian tropical tree found largely in the central and north Indian plain and forest. It is commonly known as mahuwa by the native tribal. Madhuca longifolia belongs to the family Sapotaceae [1]. It grows very fast and its average height is up to 20 meters. Large number of Madhuca longifolia trees are found in the states of Utter Pradesh, Madhya Pradesh, Orissa, Jharkhand, Chhattisgarh, Gujarat, Andhra Pradesh, Maharashtra, Bihar, west Bengal and Karnataka. It is inexpensive and the production is largely done. The estimated production of mahuwa flower is more than one million tons in the country [2]. It should be noted that the whole plant is not useful to produce biofuel, only the flower part of Madhuca longifolia tree is used to produce oil. Apart from producing biofuel from Madhuca longifolia tree this tree has may uses including medicinal purpose, domestic purpose and mostly for alcoholic drink in tropical India. It is considered holy by many tribal communities because of its usefulness. The tree is considered a boon by the native tribes who are forest dwellers and keenly conserve this tree [3]. Madhuca longifolia flower contain very high amount of sugar nearly (68-72%) which is very essential material for fermentation. Flowering period of Madhuca longifolia flower is from the month of March to May. 32-35 days are required to attain maturity. Madhuca longifolia flower are rich in total sugar out of which maximum proportion is of reducing sugar, sugar identified are sucrose, maltose, glucose, fructose, arabinose and rhamnose [4]. Madhuca longifolia flower which is rich source of sugar also contain protein 4.4%, fat 0.5%, calcium 150 mg, iron 15 mg/100gm, magnesium and vitamins [5]. If the mahua flowers are utilized as a substrate for the production of ethanol through submerged fermentation, it will become a great economic advantage in the Indian context [8].

METHOD OF PREPARATION
Collection of Madhuca longifolia flower
The Madhuca longifolia flower were collected from the forest of Madhya Pradesh, Orissa, Jharkhand, Chhattisgarh, Gujarat, Andhra Pradesh, Maharashtra, Bihar, west Bengal and Karnataka mostly tribal area.

Treatment of Madhuca longifolia flower
Flowers are washed in normal water and kept it to dry for 3-4 days in the presence of sun for removal of moisture from flower. Rao R.T.N., Dwaraknath C.T., Johar D.S. 1961 reported that in their paper Mahua flowers were used for extraction of sugar where 1 kilogram of mahua flowers autoclaved with 2 liters of water at 1 steam pressure for 15 minutes.

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Fermentation of Madhuca longifolia flower

Mostly tribal of gadchiroli located in Maharashtra state used to fermented Madhuca longifolia flower for 10 to 15 days for the production of liquor from Madhuca longifolia flower. During fermentation process the bacteria or fungi which develop in Madhuca longifolia flower contribute to convert sugar into alcohol.

Fungi (Micro-organisms)

Yeast strain Saccharomyces cerevisiae–3044 was obtained from National Collection of Industrial Microorganisms (NICM), National Chemical Laboratories (NCL), Pune (M.S.).

Sterilization

The Madhuca longifolia flower are sterilized by autoclaving at pressure 10 Ib/inch^2 for a period of 20 minute.[6]

Determination of sugar and other contains in Madhuca longifolia flower

The total sugar contain was estimated by anthrone method reagent as described by Hedge and Hofreiter (1962). Reducing sugar were estimated by using dinitrosalicylic acid (DNS) regent method as described by Miller (1962). The total soluble solids in the sample were determined with the help of hand refractometer (Erma) and expressed in terms of Brix and pH of the extract was measure by using hand held pH meter (Eutech). Titrable acidity of the sample was determined by titration with 0.1 N sodium hydroxide and was expressed in terms of anhydrous citric acid (Ranganna, 1986). Volatile acidity of the fermented sample was determined after distillation. The distillation was titrated with 0.01 N sodium hydroxide and was expressed in terms of acetic acid (Ranganna, 1986). The ethanol in the fermented sample was determined by using the specific gravity method (AOAC, 2000). The methanol in the fermented sample was determined by quantitative colorimetric micro determination method (Boos et al 1948) [4].

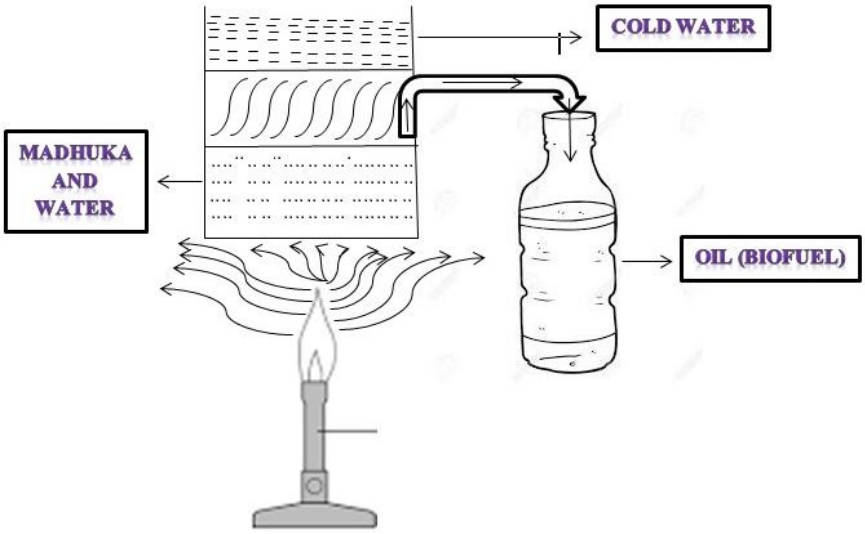

Fig: -The above diagram indicates the traditional method used by tribal to get oil from fermented Madhuca longifolia flower. In which fermented Madhuca longifolia flower add with water in ratio 1:1(% W/V) in container. Heat is supply to container for long period of time until they get oil or biofuel (Ethanol) in the form of vapour coming from outlet above the container and it collected in bottle. Above the container cold water is used to cool the hot vapours coming from boiling.

CONCLUSION

In this review article it has been concluded that the preparation of biofuel from Madhuca longifolia flower seems to be very easy and simple technique. Arun Magadum and Dr. S.N.Sridhara in their paper performance of IC Engine by Using Mahua Oil reported that the Performance of the 20% Mahua oil -biodiesel blend was only marginally poorer at part loads compared to the neat diesel performance. The low performance is due to incomplete combustion of biofuel. But the increase in research would enhance the performance of engine. Hence, Biofuel from Madhuca longifolia flower will be the source of energy in future.

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STUDIES ON PHYSICO-CHEMICAL PARAMETERS OF WATER AND ZOOPLANKTON DIVERSITY OF GODAVARI RIVER AT SADOLA, BEED DISTRICT, MAHARASHTRA

Nimbalkar R. K. and Pawar D. A.[1]
Department of Zoology, R. B. Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Zoology, Deogiri College, Aurangabad (M. S.)
rknimbalkar@gmail.com

ABSTRACT
The major role of zooplankton in an aquatic ecosystem is of energy transfer between phytoplankton and fishes. The present study deals with the physico- chemical parameters of water and diversity of zooplankton from Godavari River at Sadola, District Beed, Maharashtra. Study period was one year between January 2018 and December 2018. Godavari River at Sadola provides fish food for humans mainly of Labeo rohita, Cirrahuns mirigala, Catla catla etc. Total 35 species of zooplankton were collected of which rotifera 13 species; cladocera 8 species, copepoda 10 species and ostracoda 4 species were observed during study period of one year. The rotifera was dominated followed by copepoda, cladocera and ostracoda from the study area in one year. Throughout study duration of one year on monthly basis physico- chemical parameters such as water temperature, pH, Salinity, Dissolved Oxygen, TDS, Conductivity, Turbidity, Free CO_2 concentration and BOD were analysed. The diversity indices of zooplanktons in relation to physico- chemical parameters also calculated.

***Keywords**: Zooplankton, Diversity, Godavari River, Sadola.*

INTRODUCTION

In an aquatic ecosystem such as pond two types of producers macrophytes which are rooted or large floating plants and phytoplankton those are minute floating plants generally algae or green bacteria as distributed throughout the pond as deep as light penetrates. Water in a greenish colour observed when phytoplanktons are abundant in number. Two types of microconsumers, zooplankton and benthos (bottom forms) appears in the aquatic ecosystem, their main role is transfer of energy from lower trophic level to higher trophic level in a food chain.

Three groups of freshwater habitats can be considered as standing water or lentic ecosystems which include lakes and ponds, running water or lotic ecosystems which include streams, rivers and springs and third group of freshwater habitats is wetlands, where water levels are not same seasonally and annually or water level fluctuate up and down. Examples of wetlands are marshes and swamps. Small portion of the Earth surface is occupied by freshwater habitats compared to terrestrial and marine habitat, but freshwater habitats are more important to humans than their relative area **[1].**

The Godavari river is the one of the largest river in India, it originates from Triambakeshwar, Nashik district of Maharashtra State and flows east about 1465 Km through the states of Telangana, Andhra Pradesh, Chhaattisgarh, Madhya Pradesh, Odisha, Karnataka, Puducherry to Bay of Bengal. The physico- chemical parameters of water are mainly responsible for the distribution and diversity of zooplankton species in an aquatic ecosystem **[2].** In an aquatic food web between autotrophs and heterotrophs zooplanktons creates a main link in the transfer of energy at secondary level **[3].**

The physico- chemical parameters of water and interactions among them are very important to study the growth, reproduction, distribution, composition and diversity of aquatic organisms **[4, 5].** The basic physico- chemical parameters affecting the aquatic environments are pH, dissolved oxygen, temperature, conductivity of water and nutrients **[6].** The highest rate of organic matter decomposition which increases the higher BODs values in an ecosystem **[7].** Communities of zooplankton have been documented by the studies of **[8]** from some fresh water bodies in Kolhapur District related to pollution. Researchers documented the zooplankton community and physico- chemical parameters of Kham River, Aurangabad **[17],** Ambe Ghosale Lake of Thane city **[18]** and Narangi Sarangi dam of Vaijapur District Aurangabad of Maharashtra **[19].**

The aim of the present investigation was to study the physico- chemical parameters of the water along with zooplankton diversity and diversity indices of the zooplanktons of the Godavari River at Sadola, District Beed. Maharashtra.

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MATERIALS AND METHODS

Study Area

Sampling station was selected of Godavari River to study the physico- chemical parameters of water and diversity of zooplanktons. Sampling station is situated near Sadola village of Majalgaon taluka in Beed District. Sadola is 60 Km towards East from District headquarters Beed. Sampling station is located at a height of 407 meters above M.S.L.

Collection, Preservation and Identification

On a monthly basis from sampling station water samples were collected for the study of physico-chemical parameters and zooplankton community for a period of one year from January 2018 to December 2018. Plankton net having 60 micro meters mesh size was used for collection of planktons. Every time through the plankton net 100 litres of water was sieved. The plastic containers of 1-L capacity were used for collections, before use of the plastic containers these were rinsed with sampling water. Filled plastic containers were sealed and transported to laboratory for analysis of physico- chemical parameters.

All the times water samples were collected from same location and in morning between 7.00 am to 10.00 am. Collected samples were preserved in 4% formalin and stained with Bengal Rose. The standard protocols of **[9, 10]** were used for the analysis of physico-chemical parameters of the water samples. TDS meter is used to record the TDS of water on the spot. pH, temperature, Dissolved Oxygen and Electrical Conductance were analysed and recorded on the spot immediately after collection of water samples by using multi 340i /set water analysis kit.

Under the microscope freshwater zooplankton species were studied and standard protocols of **[11, 12]** were used for the identification of zooplanktons. Drop method was used to count the planktons. Plankton counting chamber was used for quantitative analysis and Stereomicroscope for observations. Wide mouthed pipette was used to take 1 ml of sample in counting cell and allowed to settle about 4- 5 minutes and after the counting was done. Four counting's was done for each sample of the plankton and average was calculated from it. Total planktons present in one litre of water sample were estimated by **[13, 14].**

Statistical Analysis and Diversity Indices

Different diversity indices such as Dominance_D, Simpson_1-D, Shannon-H, Evenness and Margalef were calculated by software PAST, v 3.0.

RESULTS AND DISCUSSION

Physico- Chemical Parameters

In present study on monthly basis water samples were collected and analysed for physico- chemical parameters of water collected from sampling station of Godavari River at Sadola between January 2018 and December 2018. All the physico- chemical parameters of water from sampling station are represented in Table 1.

Water temperature (^{0} C)

Lowest water temperature 24^{0}C was recorded in month of November and highest water temperature 27 ^{0}C was observed in month of May.

pH

The values of pH recorded from sampling station was in the range of 7.3±0.2 and 8.75±0.2, pH 7.3 was observed minimum in month of May, while maximum pH 8.75 was recorded in month of September.

Salinity (mg/L)

Salinity from water samples of sampling station was recorded in the range of 0.645 mg/L and 0.92 mg/ L, salinity lowest and highest was observed in May and July months respectively. Low salinity 0.645 mg/L in month of May and highest salinity 0.92 mg/L in month of July was recorded from sampling station respectively.

Dissolved Oxygen (mg/L)

The concentration of dissolved oxygen in water is depends on the physical, chemical and biochemical processes existing in aquatic systems. Minimum dissolved oxygen 9.8 mg/L and maximum value of dissolved oxygen 15.8 mg/L was recorded from sampling station in month of January and September respectively.

Conductivity (µ S/cm)

The conductivity of water from sampling station was observed in the range of 180 µ S/cm and 295 µ S/cm. Minimum conductivity of water was recorded in month of March, while in month of May conductivity was maximum.

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Turbidity (NTU)
Maximum value of turbidity recorded from sampling Station was 170 (NTU) and minimum value of turbidity was 80 (NTU) in months of September and February respectively.

Free CO_2 (mg/L)
The free CO_2 concentrations were observed in the range of 12 mg/L and 28.4 mg/L. The low free CO_2 concentration from sampling station 12 mg/L and high free CO_2 concentration 28.4 mg/L was recorded in month of February and September respectively. Our results support the statement of **[15]** that Dissolved Oxygen and Free CO_2 concentrations are reciprocal.

BOD (mg/L)
BOD range of water was 3.54 mg/L to 7.3 mg/L. Minimum BOD (3.54 mg/L) and maximum BOD (7.3 mg/L) from river water was recorded in months of March and November respectively.

Diversity of Zooplanktons
During the study period of one year from January 2018 to December 2018 total 35 species of zooplankton belonging to four orders namely rotifera (13 species), cladocera (8 species), copepoda (10 species) and ostracoda (4 species) were listed in Table 2.

Rotifera
In the study period of one year from January 2018 to December 2018, total 13 species of rotifera belonging to 7 genera were collected and are listed in table 2. The range of population density for rotifers was 565 ind/L and 772 ind/L was recorded and shown in table 3. The minimum population density 565 ind/L and maximum population density 772 ind/L were recorded in months of October and August respectively. The species dominance was minimum (0.8901) in October month, while maximum (0.917) was recorded in month of August. The Simpson diversity index was highest (0.1099) during October and low (0.08298) in month of August. The Shannon diversity index (H) was maximum (0.2224) in October while minimum (0.1785) was recorded in month of August. The highest species evenness (0.6245) and low species evenness (0.5977) was recorded in months of October and August respectively. The Margalef species richness (R1) maximum (0.1563) in month of October and minimum (0.1494) in month of August was recorded.

Cladocera
Total 8 species of cladocera belonging to 6 genera were collected in one-year study period and are listed in table 2. Population density range for cladocera was observed between 345 ind/L and 725 ind/L. Minimum and maximum population densities were recorded in months of October and June respectively, and are shown in table 3.

The species dominance was minimum (0.8328) in October, while maximum (0.9121) was recorded in month of June. The minimum values of Simpson diversity index (0.08786), Shannon diversity index (0.1867), species evenness (0.6026) and Margalef species richness (0.1508) were recorded in month of June, while maximum values of Simpson diversity index (0.1672), Shannon diversity index (0.3074), species evenness (0.6799) and Margalef species richness (0.1683) were recorded in month of October.

Copepoda
Totally 10 species of copepoda belonging to 9 genera were collected and are listed in table 2. Copepoda population density during study period was varies in between 468 ind/L and 917 ind/L, minimum population density 468 ind/L and maximum population density 917 ind/L was recorded in months of November and July respectively and are presented in Table 3. The species dominance was minimum (0.8705) in November, while maximum (0.9292) was recorded in month of July. The minimum values of Simpson diversity index (0.07083), Shannon diversity index (0.1575), species evenness (0.5853) and Margalef species richness (0.1458) were recorded in month of July, while maximum values of Simpson diversity index (0.1295), Shannon diversity index (0.2526), species evenness (0.6437) and Margalef species richness (0.1608) were recorded in month of November.

Ostracoda
Four species of ostracoda belonging to four different genera was collected in study period and are shown in table 2. Population density range for ostracoda varies in between 194 ind/L and 613 ind/L during study period. The minimum and maximum population densities 194 ind/L and 613 ind/L were recorded in months of February and July respectively. The species dominance was high (0.8978) during month of July, while low (0.741) in month of February. The maximum values of Simpson diversity index (0.259), Shannon diversity index (0.4276), species evenness (0.7668) and Margalef species richness (0.184) were found in February month,

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while minimum values of Simpson diversity index (0.1022), Shannon diversity index (0.2102), species evenness (0.6169) and Margalef species richness (0.1545) were observed in month of July.

In a food web of aquatic ecosystems zooplanktons infest the central or focal position and they assist expressively, the biological productivity of the freshwater ecosystem **[20].** According to **[21, 22 & 23]** the characteristics of tropical lakes and rivers are the dominant status of rotifer species in rivers in relative to cladocerans and copepods which our study confirmed with it. In the present study between January 2018 and December 2018 the pH values from sampling station diverges from 7.3 – 8.75 (Table 1).

Maximum metabolic activities of aquatic organisms are grounded on pH hence most aquatic organisms are tortured **[16].** Biota of an ecosystem is directly and or indirectly influenced by an extrinsic factor temperature. Diversification in temperature and photic conditions in an aquatic ecosystem vary the seasonal productivity of ecosystem. Water temperature influences metabolic and physiological activities and life processes such as movements, feeding, reproduction and aquatic organisms distribution.

In our present study minimum water temperature was recorded in winter, while maximum water temperature was found in summer season and is shown in Table 1. The Preety indicator of overall water quality is electrical conductivity **[24]** and higher values of electrical conductivity indicates the pollution level of the lakes **[25].** In our study, minimum electrical conductivity from sampling station was recorded in month of March, while maximum electrical conductivity was recorded in month of May. The plankton population of freshwater species is controlled by the major factor salinity **[26].** The total dissolved solids minimum value was recorded in January while maximum value was recorded in month of May in our study. Higher dissolved oxygen concentration is the indicator of healthy water body and DO is influential parameter in water quality valuation **[27, 28].** Our study shows that water from sampling station of Godavari river at Sadola contains higher concentration of dissolved oxygen and is adequate to sustain aquatic life form.

CONCLUSION

The present investigation study from Godavari River reveals that Seasonal variation in zooplankton diversity and its distribution is depends on the physico- chemical parameters of the water. Also, the distribution of zooplankton species in freshwater is mostly depends on water temperature factor. River water pollution should be protected from human activities and sources of water pollution to maintain the healthy aquatic ecosystems which results to sustain all life forms.

Table-1: Physico- chemical parameters of Godavari River water at Sadola Dist. Beed (MS) India between January 2018 and December 2018.

	Months											
Parameters	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Water temp (°C)	24.7	24.5	26	26.2	27	26.3	25	25.6	24.8	25	24	24.5
pH	7.5	7.8	8.6	7.8	7.3	8.5	8.55	7.95	8.75	8.6	8.7	8.25
Salinity (mg/L)	0.76	0.841	0.764	0.846	0.645	0.674	0.92	0.85	0.78	0.732	0.885	0.8
DO (mg/L)	9.8	11.7	10.5	12.9	12.4	14.6	13.5	11.4	15.8	13.1	12.9	15.3
TDS (mg/L)	0.65	0.741	0.73	0.82	0.95	0.9	0.855	0.76	0.695	0.7	0.83	0.774
Conductivity (µS/cm)	235	260	180	225	295	264	257	290	253	246	248	263
Turbidity (NTU)	128	80	153	125	138	135	140	145	170	150	130	162
Free CO2 (mg/L)	18.4	12	13.7	16.8	20.5	23	25.2	27	28.4	21.3	23.6	24
BOD (mg/L)	5.57	6.74	3.54	5.62	4.43	6.96	4.85	5.68	7	6.56	7.3	6.4

Table-2: Zooplankton species collected from Godavari River at Sadola Dist. Beed (MS) India from January to December 2018.

Sr. No	Taxonomic group / Genus	Zooplankton species
I	**Rotifera**	
A	*Asplanchna* Gosse, 1850	
1		*Asplanchna intermedia* Hudson, 1886
B	*Anuraeopsis* Lauterborn, 1900	
2		*Anuraeopsis fissa* Gosse, 1851
3		*Anuraeopsis navicula* Rousselet, 1892
C	*Filinia* Vincent, 1824	
4		*Filinia longiseta*Ehrenberg,1834
D	*Keratella* Vincent, 1822	

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5		*Keratella tropica* Apstein, 1907
E	*Branchionus* Pallas, 1776	
6		*Branchionus rubens* Ehrenberg, 1838
7		*Branchionus calyciflorus* Pallas, 1776
8		*Branchionus quadridentatus* Hermann, 1783
9		*Branchionus bidentata* Anderson, 1889
10		*Branchionus diversicornis* Daday, 1883
11		*Branchionus budapestinesis* Daday, 1885
F	*Lecane* Nitzsch, 1827	
12		*Lecane papuana* Murray, 1913
G	*Notholca* Gossse, 1886	
13		*Notholca lebis* Gosse, 1887
II	**Cladocera**	
A	*Daphnia* Muller, 1785	
14		*Daphnia carinata* King, 1853
15		*Daphnia magna* Straus, 1820
B	*Moina* Baird, 1850	
16		*Moina flagellate* Hudendroff, 1876
17		*Moina brachiata* Jurine, 1820
C	*Ceriodaphnia* Danna, 1853	
18		*Ceriodaphnia reticulata* Jurine, 1820
D	*Diaphanasoma* Fischer, 1850	
19		*Diaphanasoma excisum* Sars, *1885*
E	*Moinodaphnia* Herrick, 1887	
20		*Moinodaphnia macleayi* King, 1853
F	*Leydigo* Fischer, 1854	
21		*Leydigo acanthocercoids* Fischer, 1854
III	**Copepoda**	
A	*Eucyclops* Claus, 1893	
22		*Eucyclops speratus* Lilljeborg, 1901
B	*Mesocyclops* Claus, 1893	
23		*Mesocyclops hyalinus* Rehberg, 1880
24		*Mesocyclops aspericornis* Daday, 1906
C	*Sinediaptomus* Kiefer, 1937	
25		*Sinediaptomus indicus* Sewell, 1934
D	*Heliodiaptomus* Kiefer, 1932	
26		*Heliodiaptomus viduus* Gurney, 1916
E	*Thermocyclops* Kiefer, 1927	
27		*Thermocyclops hyalinus* Rehberg, 1880
F	*Neodiaptomus* Kiefer, 1932	
28		*Neodiaptomus lindbergi* Brehm, 1951
G	*Apocyclops* Lindberg, 1942	
29		*Apocyclops dengizicus* Lepeschkin, 1900
H	*Paracyclop* Fischer, 1853	
30		*Paracyclop fermbrialis* Fischer, 1853
I	*Cletocamptus* Schmankevitch, 1875	
31		*Cletocamptus albuquerquensis* Herrick, 1895
IV	**Ostracoda**	
A	*Cypris* Muller, 1776	
32		*Cypris protubera* Muller, 1776
B	*Cypretta* Vavra, 1895	

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33		*Cypretta fontinalis*
C	*Hemicypris* Sars, 1903	
34		*Hemicypris anomala* Furtos, 1993
D	*Cyprinous* Brady, 1886	
35		*Cyprinotus nudus* Brady, 1885

Table-3: Diversity indices of zooplankton from Godavari River at Sadola Dist. Beed (MS) India from January to December 2018.

	January	February	March	April	May	June	July	August	September	October	November	December
Rotifera												
Individuals	736	714	657	683	698	578	642	772	635	565	650	623
Dominance_D	0.9133	0.9109	0.904	0.9073	0.9091	0.8923	0.9019	0.917	0.901	0.8901	0.903	0.8993
Simpson_1-D	0.08667	0.08909	0.09604	0.09274	0.09094	0.1077	0.09805	0.08298	0.09902	0.1099	0.09697	0.1007
Shannon_H	0.1847	0.1888	0.2002	0.1948	0.1918	0.2189	0.2035	0.1785	0.2051	0.2224	0.2017	0.2078
Evenness_e^H/S	0.6014	0.6039	0.6108	0.6075	0.6057	0.6224	0.6128	0.5977	0.6138	0.6245	0.6118	0.6155
Margalef	0.1504	0.1511	0.1529	0.1521	0.1516	0.1558	0.1534	0.1494	0.1537	0.1563	0.1532	0.1541
Cladocera												
Individuals	547	495	614	561	685	725	558	464	460	345	527	455
Dominance_D	0.887	0.8766	0.898	0.8894	0.9075	0.9121	0.8889	0.8696	0.8686	0.8328	0.8832	0.8673
Simpson_1-D	0.113	0.1234	0.102	0.1106	0.0925	0.08786	0.1111	0.1304	0.1314	0.1672	0.1168	0.1327
Shannon_H	0.2273	0.2433	0.2099	0.2234	0.1944	0.1867	0.2243	0.254	0.2555	0.3074	0.2332	0.2573
Evenness_e^H/S	0.6276	0.6377	0.6168	0.6252	0.6073	0.6026	0.6257	0.6446	0.6455	0.6799	0.6313	0.6467
Margalef	0.1571	0.1594	0.1544	0.1565	0.152	0.1508	0.1566	0.161	0.1612	0.1683	0.1579	0.1614
Copepoda												
Individuals	714	709	836	865	880	872	917	845	873	663	468	632
Dominance_D	0.9109	0.9103	0.9229	0.9252	0.9264	0.9258	0.9292	0.9236	0.9259	0.9047	0.8705	0.9006
Simpson_1-D	0.08909	0.08966	0.07714	0.07475	0.07358	0.0742	0.07083	0.07638	0.07412	0.09526	0.1295	0.09944
Shannon_H	0.1888	0.1897	0.1685	0.1644	0.1623	0.1634	0.1575	0.1672	0.1633	0.1989	0.2526	0.2057
Evenness_e^H/S	0.6039	0.6045	0.5918	0.5893	0.5881	0.5888	0.5853	0.591	0.5887	0.6101	0.6437	0.6142
Margalef	0.1511	0.1512	0.1477	0.147	0.1467	0.1468	0.1458	0.1475	0.1468	0.1527	0.1608	0.1538
Ostracoda												
Individuals	368	194	531	578	553	452	613	565	559	324	438	518
Dominance_D	0.8414	0.741	0.884	0.8923	0.888	0.8666	0.8978	0.8901	0.8891	0.824	0.863	0.8814
Simpson_1-D	0.1586	0.259	0.116	0.1077	0.112	0.1334	0.1022	0.1099	0.1109	0.176	0.137	0.1186
Shannon_H	0.2952	0.4276	0.232	0.2189	0.2257	0.2584	0.2102	0.2224	0.224	0.3195	0.2639	0.2359
Evenness_e^H/S	0.6717	0.7668	0.6306	0.6224	0.6266	0.6475	0.6169	0.6245	0.6255	0.6882	0.651	0.633
Margalef	0.1667	0.184	0.1578	0.1558	0.1568	0.1616	0.1545	0.1563	0.1566	0.17	0.1624	0.1583

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ROLE OF AEROBIC EXERCISE ON CARDIOVASCULAR FITNESS IN PRESENT SCENARIO

Pagare S. B.
Department of Physical Education, R. B College, Georai, Dist. Beed (M. S.)
spagare001@gmail.com

ABSTRACT
The cardiovascular system consists of the heart and blood vessels. The cardiovascular system is responsible for pumping blood throughout the body thereby providing a rapid-transport system to distribute oxygen to the body cells and also remove carbon dioxide from the body with other waste products. Heart problems and cardiovascular diseases is one of the leading causes of death worldwide. Regular exercise offers an even more effective approach to put a stop to the increasing number of people suffering from heart diseases. Life without exercise contributes to the early onset and progression of life style disease such as cardiovascular disease, hypertension, diabetes and obesity. Cardiovascular fitness, the activity components included are not only for muscular development and endurance training. The lungs, heart, and circulatory system are also the focal points in health and fitness. Decreased physical fitness may result from various diseases, especially when accompanied by prolonged recumbence, or from inactivity such as a sedentary lifestyle and a low- level of physical activity. Increased amount of daily exercise, on the other hand, is associated with a decreased incidence of hypertension and cardio-related disorders.

Keywords: *Aerobic, Cardio Vascular fitness, hypertension.*

INTRODUCTION
The cardiovascular system is responsible for pumping blood throughout the body thereby providing a rapid-transport system to distribute oxygen to the body cells and also remove carbon dioxide from the body with other waste products. The cardiovascular system consists of the heart and blood vessels. When the body is at rest cardiovascular disease as one caused by unhealthy lifestyle including smoking, poor diet and sedentary behaviour . Cardiovascular diseases have behavioural correlates and that physical inactivity is related to cardiovascular disease . Low cardiovascular fitness may result in high physical strain on the body .For Cardiovascular fitness, the activity components included are not only for muscular development and endurance training. The lungs, heart, and circulatory system are also the focal points in health and fitness. The reason for this is to improve stamina, immune system, and maintain good body composition. Cardiovascular fitness reduces the risk of cardiovascular diseases and other diseases like hypertension ,Diabetes obesity, and may cure respiratory problems like asthma **(Amusa, & Goon ,2011)**.

Life without exercise or physical Fitness contributes to the early onset and progression of life style disease such as cardiovascular disease, hypertension, diabetes and obesity.

The importance of cardiovascular fitness to health for all individuals has been well documented. Physical fitness is a required element for all the activities in our life. Cardiovascular fitness of an individual is mainly dependent on lifestyle related factors such as daily physical activity levels. It was believed that the low cardiovascular fitness level of an individual is associated with higher mortality rate. (jourkhesh et.al.2012).

CIRCULATORY EFFECTS
Regular exercise has improved the cardio vascular system, decreased some of the risk factors leading to a cardiovascular disease, promoted fat loss, increased muscle mass, increased glucose intake by cells and enhanced well- being of the sedentary students. In other research (Clausen J P 1997) physical fitness was noted to improve cardiovascular fitness and work capacity, while decreasing resting and exercise blood pressure, as well as peripheral vascular resistance. Finally, physical fitness has been shown to decrease the risk of cardiovascular disease and improve total cholesterol and high density lipoprotein levels (Milesis et. al. 1976).Exercise also means total caloric expenditure promotes fat loss, and increases lean body mass (Maynard 1991). Heart size increases due to exercise and the strength training causes increase in the thickness of ventricle walls thereby increasing the efficiency of heart. Stroke volume increases progressively from rest to moderate work and then it levels off at about 30 to 40% of the maximum aerobic power. As result exercise, the size of the heart change Regular practice of exercise increased cardiac output by 40-60% of maximal capacity during rest it is around liters/min. whereas while exercising, it increases up to 40 liters/minute.. When an individual suffers from stress, it constricts breathing passage, creates tension in the heart muscles, and increase heart rate. When this happens, one simply has to start executing aerobic exercises to release pressure exerted on the heart and its surrounding muscles. Daily or regular exercises and aerobic exercise also known to effectively reduce anxiety

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or depression caused by stress and ultimaly reduce the risk of cardiovascular Disease . Heart problems and cardiovascular diseases is one of the leading causes of death worldwide. Finding an effective cure against these type of diseases will greatly reduce to mortality rate. But regular exercise offers an even more effective approach to put a stop to the increasing number of people suffering from heart diseases. Hence, expert physical education suggest incorporating Aerobic exercise, calisthenics and resistance exercises into the daily life so that one can embark on an important lifestyle transformation that will improve the heart condition.

BLOOD PRESSURE

Blood pressure control due to exercise as the requirement of blood by the muscles is increased. The pressure exerted on the walls of the blood vessels increases as the heart pumps more and more blood to meet the requirement of muscles. Pulse become normal in the shorter duration after the cessation of activity in case of trained athletes. Exercise resulting as new capillaries are formed within the muscle fibers.

CARDIO- RESPIRATORY EFFECTS

Heart rate shows a gradual adaptation to an increased work load by increasing proportionally to the modern exercise and will plateau at a given level for about 2 to 3 minutes. The resting heart rate decreases with exercise. The rate of oxygen consumption can be estimated by taking the heart rate. The amount of blood flowing to the various organs increases due to exercise.

CONCLUSIONS

Cardiovascular diseases is one of the leading causes of death worldwide. regular exercise offers an even more effective approach to put a stop to the increasing number of people suffering from heart diseases. . Finding an effective cure against these type of diseases will greatly reduce to mortality rate.Finally, this paper provide a greater insight to eliminate the risks of diseases such as hypertension, and cardio vascular problems to the people.

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EVIDENCE BASED LIBRARIANSHIP

Pagore R. B.
Librarian, R. B. Attal College, Georai, Dist. Beed (M. S.)
pranjeet23@gmail.com

ABSTRACT
Evidence-based librarianship (EBL) is a complementary mechanism that helps librarian in problem solving and decision making process. This concept certainly gives additional value to library in many aspects of librarianship activities and services. EBL supports librarian to apply evidence in their daily practices since the concept is moderately flexible and appropriate in many areas in library. The aim of this paper is to identify librarian's attitude in towards evidence based librarianship (EBL). The librarian response towards the level of evidence used by the librarian and source of evidence used by them is moderate.

Keywords: *Evidence-based Practices, Evidence-based Librarianship (EBL), Evidence-based Library and Information Practices (EBLIP), Academic Libraries, Library Management*

INTRODUCTION
The evidence-based movement has emerged in the past few years in response to changes in the health care arena. Signalling this new orientation, many diverse disciplines and specialties have begun to attach the term evidence-based to their titles: cardiology, pediatrics, surgery, nursing, gastroenterology, diagnostic radiology, disease management, pathology, midwifery, complementary or alternative medicine, and health policy. The two principal evidence-based movement journals, ACP Journal Club and Evidence-Based Medicine, are quickly gaining recognition as core journals in clinical medicine. Other specialties have also formed their own journals.
The movement originated as evidence-based medicine (EBM) and recently has been eclipsed somewhat by a much broader movement, referred to as evidence based health care (EBHC). EBM still retains considerable methodological rigor whereas EBHC seems to offer greater flexibility and adaptability to disciplines outside clinical medicine. At this stage, EBM has been more clearly and comprehensively articulated by its advocates than has EBHC. The new book Narrative Based Medicine suggests that there may even be the formation of at least one splinter movement. After a decade of intense activity and increased acceptance as a framework for decision making, both the EBM and EBHC movements represent a major directional change rather than another passing fad in the healthcare arena.
The proliferation of so many evidence-based special-ties appears to bode well for health sciences librarians. After all, librarians have positioned themselves as the experts at searching for the evidence needed for each of these elements in the larger EBHC movement. Health sciences librarians apparently even played a role in attempts to implement aspects of EBM during the 1920s. The EBHC movement nevertheless expects each area in health care to supply the necessary evidence to support its ongoing activities and operations. Cardiologists must have the evidence at hand to support their decisions to employ procedures, such as a cauterization. Librarians similarly are called upon with increasing frequency to provide the requested evidence to continue provision of their collections, operations, or services. No wonder, then, that MLA President J. Michael Homan has identified the need to ''foster evidence-based librarianship'' as a major goal. Evidence-based librarianship (EBL) adapts its core characteristics from the EBM and EBHC movements. EBM, in particular, offers some of the most powerful research designs available, such as randomized controlled trials and a decision-making framework that have been largely untapped by health sciences librarians. In clinical medicine, these research methods are intended to establish causal relationships while minimizing systematic or human biases. Until recently, health sciences librarianship has been largely influenced by research designs developed in the social, behavioural, and management sciences. Theoretical approaches developed in humanities disciplines, such as history or philosophy, have also influenced the field. EBL now seeks to adapt rigorously tested research designs from the health sciences, particularly clinical medicine. To adapt core characteristics from EBM does not imply that EBL imitates EBM, or even EBHC, blindly. EBM focuses upon a disease-based model of decision making, whereas EBHC has a different type of appeal to health sciences librarians due to its flexibility in choice of methods and its similar service models. EBL incorporates the decision-making framework, the basic process, and many of the same research methods as EBM as a means to improve library practices. EBL employs the best available evidence based upon library science research to arrive at sound decisions about solving practical problems in librarianship. EBL also enables health sciences librarians to practice the broad goal of continual, lifelong, self-directed learning while improving their practices. Unique circumstances in librarianship lead to a few intentional variations from the standard EBM approaches. This article describes how the core characteristics of EBM and EBHC can be adapted to EBL. The author makes no claim to offer the definitive

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statement of what EBL should mean. This proposed framework remains largely speculative at this stage in its development. Only a continuous dialogue within the profession will produce such a consensus. The concept of EBL preceded coinage of the actual term ‘‘evidence-based librarianship’’ by several years, just as the concept of EBM proceeded the published term ‘‘evidence-based medicine’’. In other words, both EBL and EBM are dynamic and evolving approaches to integrating research into practice. This article offers a conceptual framework to stimulate a dialogue; EBM and EBHC core characteristics and approaches are briefly reviewed and then followed by illustrations of how these approaches apply to health sciences librarianship. Because most health sciences librarians are already familiar with many of the core characteristics of EBM and EBHC, this article will avoid detailed explanations of either EBM or EBHC. The author has made sufficient references to original EBM and EBHC documents to lead the curious reader to in-depth explanations of these core characteristics.

DEFINITION

“Evidence-based librarianship seeks to reintegrate the ‘‘science’’ back into library science. Davidoff writes: Science is cognitive, involving accurate observation and clear description, hypothesis generation, data gathering and inter-predation, and the creation of theory. But science is also a state of mind: sceptical, open, balanced, respectful of evidence, thorough, always on the alert for bias.

Library science cannot be conceived of as a remote, ivory tower endeavour. Librarians operate their libraries in the real world context of providing services and collections through managing budgets and other re-sources. Thus, EBL constitutes an *applied* rather than theoretical science. EBL merges scientific research with the pressing need to solve practical problems. And, like the scientific method, EBL provides a framework for self-correction as new information becomes available that suggests new directions or methods.”

A PRELIMINARY CONCEPTUAL FRAMEWORK FOR EVIDENCE-BASED LIBRARIANSHIP (EBL)

The author proposes the following seven-part conceptual framework of EBL:

1. EBL seeks to improve library practice by utilizing the best-available evidence combined with a pragmatic perspective developed from working experiences in librarianship;
2. EBL applies the best-available evidence, whether based upon either quantitative or qualitative research methods;
3. EBL encourages the pursuit of increasingly rigorous research strategies to support decisions affecting library practice;
4. EBL values research in all its diverse forms and encourages its communication, preferably through peer reviewed or other forms of authoritative dissemination
5. EBL represents a global approach to information seeking and knowledge development, involving research but not restricted to research alone;
6. EBL supports the adoption of practice guidelines and standards developed by expert committees based upon the best-available evidence, but *not* as an endorsement of adhering to rigid protocols; and
7. In the absence of compelling reasons to pursue another course, EBL adheres to the hierarchy (or levels) in for using the best-available evidence, lending priority to higher levels of evidence from the research.

The remaining sections of this article will further clarify the meanings of this seven-part conceptual framework of EBL.

EBL LEVELS OF EVIDENCE

1. Systematic Reviews
2. Randomized Control Trials
3. Controlled Comparison Studies
4. Cohort Design Studies
5. Descriptive Survey
6. Decision Analysis
7. Case Studies
8. Qualitative Research

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1. SYSTEMATIC REVIEW

Systematic reviews are a type of literature review that uses systematic methods to collect secondary data, critically appraise research studies, and synthesize studies. Systematic reviews formulate research questions that are broad or narrow in scope, and identify and synthesize studies that directly relate to the systematic review question. They are designed to provide a complete, exhaustive summary of current evidence relevant to a research question. Systematic reviews of randomized controlled trials are key to the practice of evidence-based medicine,[2] and a review of existing studies is often quicker and cheaper than embarking on a new study.

2. RANDOMIZED CONTROL TRIALS

A randomized controlled trial (or randomized control trial; RCT) is a type of scientific (often medical) experiment which aims to reduce bias when testing a new treatment. The people participating in the trial are randomly allocated to either the group receiving the treatment under investigation or to a group receiving standard treatment (or placebo treatment) as the control.

3. CONTROLLED COMPARISON STUDIES

Cross-cultural studies are the third form of cross-cultural comparisons. The first is comparison of case studies; the second is controlled comparison among variants

4. COHORT DESIGN STUDIES

A study that tracks over time defined population (the Cohort). This group may or may not be exposed to factors hypothesized to influence the probability of the occurrence of a particular disease or other outcomes. Cohort as defined populations which, as a whole are followed in an attempt to determine disguising subgroup characteristics

5. DESCRIPTIVE SURVEY

Descriptive research methods are pretty much as they sound — they describe situations. They do not make accurate predictions, and they do not determine cause and effect. There are three main types of descriptive methods: observational methods, case-study methods and survey methods.

6. DECISION ANALYSIS

Decision analysis refers to a systematic, quantitative and interactive approach to addressing and evaluating important choices confronted by organisations in the private and public sector. Decision analysis is interdisciplinary and draws on theories from the fields of psychology, economics, and management science.

7. CASE STUDIES

In the social sciences and life sciences, a case study is a research method involving an up-close, in-depth, and detailed examination of a subject of study (the case), as well as its related contextual conditions. Case studies can be produced by following a formal research method.

8. QUALITATIVE RESEARCH

Qualitative Research is primarily exploratory research. It is used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research

IMPLEMENTING THE NINE LEVELS OF EBL EVIDENCE

Most librarians can appreciate the need to adhere to the levels of evidence due to the demonstrated relative strengths of each method. These comparative evaluations of the risks of different research methods in introducing human or systematic bias and the relative strength of each in determining causal relationships are familiar to past students in research courses. Thus, there has been little debate about this issue. It may seem discouraging; however, that librarianship does not offer a better representation of the more rigorous methods at the higher levels of evidence. There are three points to keep in mind on this issue. First, the Canadian Task Force on the Periodic Health Examination noted, in 1979, the ‘‘lack of strong experimental evidence for or against most of the measures that we have considered.’’ The task force further noted that ‘‘Even evidence from cohort studies and case-control studies was infrequently found’’. Secondly, there are still many current health care practices that lack sufficient evidence to justify their continuation with enough confidence, although that number has been shrinking as the result of the EBM movement. In some specialties—such as ear, nose, and throat surgery; anaesthesiology; burns management; surgery; or emergency medicine researchers have concluded that an insufficient evidence base exists in those specialties for a variety of reasons. Yet, some of these researchers suggest that their respective evidence bases can be improved in spite of the current situation. Finally, librarianship may now have a plausible strategic framework through EBL to catch up quickly to the rigorous levels of EBM.

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CONCLUSION

Every day health sciences librarians, like their colleagues in other health care specialties, make numerous decisions. These decisions range from the critical to the mundane. Upon reflection, readers may be reminded of some of these decisions: With what vendor should the library contract large sums of money for book, journal, or database services? Which staff-training program should the library employ? What library resources or services should be emphasized? What are the essential factors in deciding between print and electronic media? To what journals should the library subscribe? Which books should be bought? What tools

Best answer reference questions? EBL offers a possible framework for making these decisions under conditions of uncertainty by providing a system for evaluating different forms of research evidence. By employing these methods that are familiar to many colleagues in other areas of health care, librarians also increase understanding about their unique challenges and invite collaboration from outside librarianship. The roads to EBM and EBHC in other areas of health care were full of obstacles, conceptual dead ends, and setbacks. By adapting the evolved core characteristics of EBM and EBHC that seem most applicable to librarians' circumstances, EBL can advance the mission of librarianship faster and more effectively. The foundations of EBL proceeded the actual term, and health sciences librarians already are using most of the levels of evidence as outlined in this article. As EBL continues to evolve, librarians undoubtedly will find an increasing number of research projects conducted at the higher levels of evidence that are capable of facilitating practical decisions. Research studies are essential ingredients in making critical decisions. Although EBL provides a framework for focused thinking about decisions, it still requires librarians to think about their decisions. As Dauten states: ''just because we increase the speed of information, doesn't mean we can increase the speed of decisions, Pondering, reflecting and ruminating are undervalued skills.''

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INCIDENCE OF *ASPERGILLUS SPECIES* ON SEEDS OF PULSES FROM MARATHWADA REGION

Pangrikar P. P., Solanke S. N. and Bandewar S. T.[1]
Department of Botany, R. B.Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Botany, Rajashri Shahu College, Pathri, Aurangabad (M. S.)
ppangrikar@gmail.com

ABSTRACT
In agriculture, pulses have great importance in Indian agriculture as they are rich source of protein (17 to 25 percent) as compared to cereals. Pulses have ability to fix atmospheric nitrogen and improve soil quality. Pulses like Green gram (Vigna radiate (L.) Wilczek), Black gram or Urid Bean (Vigna mungo (L.) Hepper.), Chickpea or Gram (Cicer arientinum L.) and Pigeon pea or Tuver (Cajanus cajan(L.) Millsp., are mainly cultivated in Marathwada region. The damage to pulse seeds caused by storage fungi due to their growth and metabolic activities. During storage, several microbes including bacteria, nematodes, fungi etc damage seeds by production of extra cellular enzymes and secondary metabolites like toxins. So study of such fungi were carriedout and their percent incidence were observed.

Keywords*: Pulses, storage fungi, Aspergillus spp.*

INTRODUCTION

In agriculture, pulses have great importance in Indian agriculture as they are rich source of protein (17 to 25 percent) as compared to cereals. Pulses have ability to fix atmospheric nitrogen and improve soil quality. Pulses are good sources of protein which is cheaper than other protein rich food like meat and fish.

In Marathwada region of Maharashtra State, pulses like Green gram (*Vigna radiate (*L.) Wilczek), Black gram or Urid Bean (*Vigna mungo* (L.) Hepper.), Chickpea or Gram (*Cicer arientinum* L.) and Pigeon pea or Tuver (*Cajanus cajan*(L.) Millsp., are mainly cultivated in both Rabi and Kharif seasons. The seeds of these crops are used for consumption as well as the residue is used as cattle feed.

It is reported in literatures that, during storage, several microbes including bacteria, nematodes, fungi etc damage seeds by production of extra cellular enzymes and secondary metabolites like toxins. The species of *Aspergillus, Penicillium, Fusarium, Rhizopus* and *Alternaria* were found to be more commonly occurring as post harvest molds in storage condition. Out of which *Aspergillus* are dominant and play vital role in the seed biodeterioration.

The damage to pulse seeds caused by storage fungi due to their growth and metabolic activities can be categorized in 8 categories: 1)decrease in germinability, 2) fat acidity, 3) discolouration, 4) heating, 5) production of mycotoxins, 6) mustiness, 7) caking and 8) Total decay.

Enzymes (lipase) produced by seed born fungi were also involved in seed biodeterioration. The species of *Aspergillus* are reported to release secondary metabolites such as mycotoxins, that makes the product unsafe for human and animal consumptions. Mainly *Aspergillus parasiticus* and *A. flavus* are reported to produce aflatoxin which are carcinogenic in nature.Considering the importance of the fact present research work was carried out.

MATERIAL METHODS

Collection of pulse seed samples

Different pulse seeds samples were collected by the method described by Neergaard (1973). Different pulse seed varieties were collected from fields, store houses, market places, research institutions and seed companies. For different variety of pulse seed collection, different region of Maharashtra, i.e. Aurangabad, Jalna, Beed, Latur, Osmanabad, Parbhani, Nanded etc. were explored. All the seed samples of different variety were sorted according to different abnormal category, healthy seeds and stored in cloth bags, plastic bags in laboratory conditions at room temperature during the studies.

Detection of seed mycoflora

The standard methods recommended by International Seed Testing Association (ISTA 1996); Neergaard (1973) and Agarwal (1976) were followed for the isolation of seed mycoflora, moist blotter method (SBM) and Agar plate method (APM) were followed.

a) Standard blotter method (SBM)

White blotter papers of 8.5cm diameter was soaked in sterile distilled water and placed in pre-sterilized petriplates of 10cm diameter. Ten pulse seeds of each variety and abnormal category were placed at equal distance on the moist blotters. The plates were incubated at 25±2^{o}C under diurnal conditions for 7 days.

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b) Agar plate method (APM)

In order to isolate internal mycoflora, seeds were pre-treated with 0.1% solution of mercuric chloride for two minutes and subsequently thoroughly washed thrice with sterile distilled water and placed on agar plates. Seeds without any such pre-treatment were employed for the total seed mycoflora.

Pre-sterilized glass petriplates of 10cm diameter were poured with 15ml of autoclaved medium. On cooling of medium, ten seeds per petriplates of the test sample were placed at equal distance aseptically. Incubation conditions and other details were same as described for the blotter method.

MEDIA USED IN ISOLATION

I) Potato Dextrose Agar (PDA)

II) Czapek Dox Agar (CZA)

III) Martin's Rose Bengal Agar (RBA)

IDENTIFICATION OF SEED-BORNE FUNGI

The fungi isolated from different pulse seeds, were identified preliminary on the basis of sporulation characters like sexual or asexual spores with the help of stereoscopic binocular microscope. The identification and further confirmation of seed-borne fungi was made by preparing slides of the fungal growth and observing them under compound microscope. The identification was made with the help of manuals. Pure cultures of these fungi were prepared and maintained on potato dextrose agar (PDA) slants.

EXPERIMENTAL RESULTS

1) Incidence of *Aspergillus species* on different pulse seeds

To study the incidence of different *Aspergillus* species associated with commonly grown varieties of different pulse seeds like Green gram, Black gram, Chickpea and Pigeon pea were collected from different regions of Marathwada of Maharashtra state. These pulse seed were then surface sterilized and inoculated on different media and incubated at 30 ^{0}C for 7 days.

As the results observed in the table.1 total ten *Aspergillus* species were isolated. The fungi like *A. flavus, A. fumigatus, A. glaucus, A. niger, A. terreus, A. ustus* and *A. versicolor* showed their incidence on all selected pulse seeds. *A. oryzae* and *A. parasiticus* were found to be totally absent on Black gram seeds, similarly *A. nidulance* on Chickpea and *A. oryzae* on Pigeon pea were found to be absent. It is clear from the table 1 that the percent incidence of *A. flavus* and *A. niger* were more dominated on all selected five pulse seeds as compare to other isolated fungi.

2. Percent incidence of *Aspergillus* on different media

It is clear from the result observed in table 3 that, blotter paper method yield less *Aspergillus species* from pulse seeds than that of agar plate method. Totally six *Aspergillus* species viz. *Aspergillus flavus, A. fumigatus, A. nidulance, A. niger, A. terreus* and *A. ustus* were isolated on blotter paper. The *Aspergillus* species like *A. flavus, A. fumigatus, A. niger* and *A. ustus* were found to be dominant on blotter paper as compare to other *Aspergillus* species.

It was interesting to note that the fungi like *A. glaucus, A. oryzae, A. parasiticus* and *A. versicolor* were totally absent on blotter paper but they were recovered from agar plate method. PDA was found to more favorable for isolation of fungi as compared to other media.

On PDA and RBA medium, ten *Aspergillus* species viz. *A. flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* were isolated from Green gram. On the other hand, seven *Aspergillus* species were isolated viz. *A. flavus, A. glaucus, A. niger, A. oryzae, A. parasiticus, A. ustus* and *A. versicolor* from Green gram on GNA media.

In case of Black gram, eight *Aspergillus* species i.e. *Aspergillus flavus, A. fumigatus, A. glaucus, A. niger, A. terreus, A. ustus, A. versicolor* were isolated on PDA and seven species viz. *A. flavus, A. fumigatus, A. glaucus, A. niger, A. terreus, A. ustus* and *A. versicolor* were isolated on RBA. On GNA only five *Aspergillus* species were isolated namely *A. flavus, A. niger, A. ustus* and *A. versicolor.*

Eight species of *Aspergillus* were found to be isolated on Chickpea on PDA namely *Aspergillus flavus, A. fumigatus, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* where as on RBA number of species isolated to six viz. *A. flavus, A. fumigatus, A. glaucus, A. niger, A. terreus* and *A. versicolor.* Number of *Aspergillus* species isolated on Chickpea on GNA found to be reduced to five namely *A. flavus, A. fumigatus, A. niger, A. parasiticus* and *A. ustus.*

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In case of Pigeon pea, eight *Aspergillus* species were i.e. *Aspergillus flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. terreus, A. ustus* and *A. versicolor* were isolated on PDA, on RBA medium seven species viz. *A. flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. terreus* and *A. ustus* where isolated and on GNA, only six *Aspergillus* species namely *A. flavus, A. fumigatus, A. niger, A. parasiticus, A. ustus* and *A. versicolor* were isolated.

Ten species of *Aspergillus* were isolated in case of Safflower on PDA i.e. *Aspergillus flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* and nine species on RBA viz. *Aspergillus flavus, A. fumigatus, A. glaucus, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* where as on GNA only six species *Aspergillus* species i.e. *A. flavus, A. fumigatus, A. niger, A. parasiticus, A. terreus* and *A. versicolor.*

3. Percent incidence of *Aspergillus* species on abnormal pulse seeds:

To study the relationship between seed abnormality and associated fungi, all the collected pulse seeds were categorized in four types of abnormalities viz. Shrunken (Sh), Undersized (Us), Discolored (Dc) and Cracked (Cr). These seeds were plated separately on agar media and results were recorded in table 2.

It is clear from the result in the table no.2, that the undersized and discolored seeds yield maximum number of *Aspergillus* species. The percent incidence of *A. flavus, A. fumigatus, A. oryzae* and *A. terreus* was found to be maximum on discolored seeds i.e. 41.90%, 4.47%, 5.11 and 5.81% respectively. Similarly, *A. glaucus* (4.37%), *A. nidulans* (4.56%) and *A. versicolor* (7.75%) shows maximum incidence on undersized seeds. On the other hand *A. niger* (49.5), *A. parasiticus* (6.25) and *A. ustus* (3.81) showed maximum incidence on cracked seeds.

It was interesting to observe that *A. oryzae* on cracked seeds and *Aspergillus parasiticus* on shrunken seeds were totally absent in all the varieties of pulse seeds.

Table-1: Incidence of *Aspergillus* species on different pulse seeds

***Aspergillus* species**	**Pulse seeds (% incidence)**			
	Green gram	**Black gram**	**Chickpea**	**Pigeon pea**
A. flavus	31.5	16.0	44.0	27.0
A. fumigates	3.0	1.0	3.5	3.0
A. glaucus	1.5	1.5	0.5	1.0
A. nidulance	0.5	0.5	-	1.0
A. niger	38.0	12.0	38.5	35.0
A. oryzae	5.0	-	0.5	-
A. parasiticus	0.5	-	0.5	2.0
A. terreus	0.5	5.5	1.0	3.0
A. ustus	4.5	2.0	1.0	2.5
A. versicolor	2.5	1.5	3.0	1.0

Table-2: Incidence of *Aspergillus* species on abnormal pulse seeds

***Aspergillus* species**	**Pulse seeds (% incidence)**			
	Sh	**Us**	**Dc**	**Cr**
A. flavus	27.78	18.84	41.90	39.00
A. fumigates	04.15	03.25	04.47	03.18
A. glaucus	00.87	04.37	01.59	01.33
A. nidulance	00.31	04.56	00.95	02.75
A. niger	29.37	24.62	39.88	49.5
A. oryzae	01.87	01.25	05.11	-
A. parasiticus	-	00.53	00.52	06.25
A. terreus	03.993	01.62	05.81	00.31
A. ustus	02.84	03.18	03.56	03.81
A. versicolor	01.96	07.75	02.29	03.75

Sh = Shrunken, Us = Under sized, Dc = Discoloured, Cr = cracked

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Table-3: Incidence of *Aspergillus* species on different media (% incidence)

Aspergillus species	PDA				RBA				GNA				Blotter			
	Gg	Bg	Cp	Pp	Gg	Bg	Cp	Pp	Gg	Bg	Cp	Pp	Gg	Bg	Cp	Pp
***A.* 1**	32.0	10.0	51.0	30.0	31.0	22.0	37.0	25.0	25.0	25.0	30.0	10.5	40.5	30.5	55.5	45.0
***A.*2**	3.0	01.0	3.0	3.0	3.0	1.0	3.5	2.5	-	-	10.0	20.5	10.5	70.5	10.0	80.5
***A* .3**	1.5	1.5	-	0.5	1.0	1.5	0.5	1.5	0.5	-	-	-	-	-	-	-
***A.* 4**	0.5	0.5	-	1.0	0.5	-	-	1.0	-	-	-	-	1.0	1.0	-	-
***A.* 5**	39.0	11.0	25.5	38.0	38.0	13.0	51.0	32.0	10.0	10.5	25.5	30.5	60.5	20.0	60.0	56.0
***A.*6**	4.5	-	0.5	-	6.0	-	-	-	20.5	-	-	-	-	-	-	-
***A.* 7**	0.5	-	1.0	-	0.5	-	-	-	1.0	-	10.5	0.5	-	-	-	-
***A.* 8**	0.5	2.5	1.0	3.5	0.5	8.0	1.0	2.5	-	-	-	-	2.0	-	-	10.0
***A.* 9**	5.0	0.5	2.0	3.0	4.0	3.0	-	2.0	15.0	1.5	1.5	0.5	20.0	4.5	2.5	10.0
***A.* 10**	3.0	0.5	4.0	1.0	2.5	3.0	2.0	-	10.0	1.0	-	1.0	-	-	-	-

PDA= Potato Dextrose agar, RBA= Rose Bengal agar, GNA= Glucose nitrate agar, Gg= Green gram, Bg= Black gram, Cp= Chickpea, Pp= Pigeon pea.

*A.*1= *A. flavus* , *A.*2= *A .fumigatus, A.*3= *A. glaucus, A.*4= *A. nidulans* , *A.*5= *A. niger, A.*6= *A. oryzae* , *A.*7= *A. parasiticus* , *A.*8= *A. terreus, A.*9= *A. ustus, A.*10= *A. versicolor,*

CONCLUSION

Ten dominant *Aspergillus* species like *A. flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* were isolated from pulse seeds.

Blotter paper method yields less *Aspergillus* species from pulse seedsas compared to Agar plate method. On PDA medium maximum *Aspergillus* species were isolated as compared to RBA and GNA media.

Eight species of *Aspergillus* species *i.e. A. flavus, A. fumigatus, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* were isolated on PDA medium from Chickpea seeds. Whereas on RBA only six *Aspergillus* species viz. *A. flavus, A. fumigatus, A. glaucus, , A. niger, A. terreus* and *A. versicolor* from Chickpea seeds.

Only five *Aspergillus* species viz. *A. flavus, A. fumigatus, A. niger, A. parasiticus* and *A. ustus* were isolated on GNA medium from Chickpea seeds.

In Black gram, eight *Aspergillus* species viz. *A. flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. terreus, A. ustus* and *A. versicolor* were isolated on PDA. Where as on RBA and GNA media *Aspergillus* species number was reduced.

From Pigeon pea seeds, ten *Aspergillus* species viz. like *A. flavus, A. fumigatus, A. glaucus, A. nidulans, A. niger, A. oryzae, A. parasiticus, A. terreus, A. ustus* and *A. versicolor* were isolated on PDA.

Among seed abnormalities, discolored and undersized seeds showed maximum association of *Aspergillus* species qualitatively and quantitatively.

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BIOSENSOR FOR BRAIN: A REVIEW

Gaikwad P. D.
Department of Physics, R. B. Attal College, Georai, Dist. Beed (M. S.)
pdgaikwad11@gmail.com

ABSTRACT
This review outlines biosensor designs to enhance the sensitivity and detection with less biofouling occurrence and minimal detection of interference species. There are many challenges in the development of a reproducible and stable implantable biosensor because many factors and limitations may affect the detection performance. However, the incorporation of multiple scales is needed to address the basic issues and combinations across the various disciplines needed to achieve the success of the system to overcome the challenges in the development of an implantable biosensor.

***Keywords**: brain glutamate, biosensing techniques, electrode*

INTRODUCTION

Biosensor

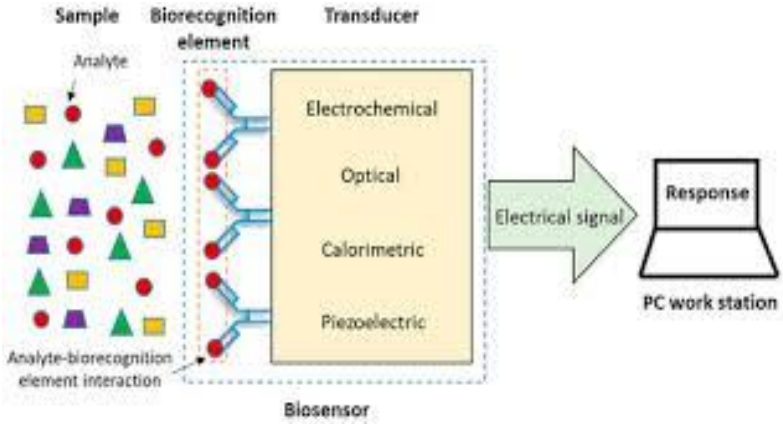

Figure-1: Schematic representation of a typical biosensor

A biosensor is defined as a sensor that transforms chemical information from a biochemical reaction concentration of a sample component to an analysis composition into an analytically helpful signal (1). The term biosensor has been widely applied to a number of devices used to monitor incorporate biotic elements. A biosensor is composed of two elements: a biological recognition unit that specifically interact with a target and a transducer that is able to convert a change in the property of the solution or electrode surface, as a result of complex formation, into a recordable signal. Used to monitor incorporate biotic elements.[1] An electrochemical biosensor is a self-contained integrated device, which is capable of providing specific quantitative or semi-quantitative analytical information using a biological recognition element (biochemical receptor) that is retained in direct spatial contact with an electrochemical transduction element [1].

The detection of a biological system in the form of a biochemical as an example analyte concentration will translate the information into a chemical or physical output, which is referred to as the sensitivity. The key idea of this identification system is to provide a high degree of selectivity for the analyte to be measured a transducer is part of a sensor, also referred to as a electrode, which transfers the signal from the analyte or the output of the reaction product into an electrical signal. Thus, a transducer provides a bidirectional signal transfer It consists of 3 parts: a "sensitive biological element" in which the sensitive elements can be created by biological engineering. Next, the "transducer" element" (works in a physicochemical way; electrochemical) that transforms the signal that results from the interaction of the analyte with the biological element into another signal (i.e., transducers) that can be more easily measured and quantified. An associated signal processor displays the results in a user-friendly way. A common example of a commercial biosensor is the blood glucose biosensor, which uses the enzyme glucose oxidase to break down blood glucose.

Potentiometric measurements are involved in the determination of potential differences between an indicator and reference electrode or two reference electrodes separated by a permselective membrane when there is no significant current flowing between them. The transducer could be an ion selective electrode (ISE), which is an electrochemical sensor based on a thin film or selective membrane coating. The potential differences between

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indicators and the reference electrode are proportional to the logarithm of the ion activity or concentration, which has been described by the Nerst-Donnan equation..

When the permselective membrane layer is placed adjacent to the potentiometric detector, several points must be considered: (i) Transportation of the substrate or analyte to be analysed to the electrode or biosensor surface.(ii) Diffusion of the analyte to the reacting membrane layer.(iii) Reaction of the analyte in the presence of enzyme.(iv) Diffusion of the product reaction towards the detector and solution

MONITORING OF ANALYTE

Hydrogen peroxide

Highly sensitive H2O2 electrodes have been combined with H2O2 producing oxidization to construct useful biosensors for various analytes. This approach is typically conducted at a relatively high applied potential for direct oxidation on the electrode surface for this study. The H2O2 generated as a result of the enzyme-catalysed oxidation of substrate (i.e., analyte) and the transfer of electrons to oxygen is subsequently oxidised or reduced at the electrode surface to provide a measurable current that can be correlated with the analyte concentration[2

$$H2O2 \rightarrow O2 + 2\,H+ + 2e \quad (1)$$

The focus of this study is the platinum electrode, which is involved in the oxidation H2O2 with the interaction of platinum oxides, such as Pt (OH)2.

$$H2O2 + Pt(OH)2 \rightarrow Pt(OH)2.\ H2O2 \quad (2)$$

$$Pt(OH)2.\ H2O2 \rightarrow Pt + 2\,H2O + O2 \quad (3)$$

$$Pt + 2\,H2O \rightarrow Pt(OH)2 + 2\,H+ + 2e \quad (4)$$

it undergoes a non-redox platinum catalysed disproportionate reaction at the electrode surface. The extent of this reaction varies with the electrode material and its pre-treatment (3).

Type of Electrode

Many types of electrodes have been designed to develop an increased sensitivity towards a target analyte. Furthermore, the stability, persistency, flexibility, simple and low cost architecture of the electrode are key factors for the development of a biosensor. The first-generation biosensor methods of H2O2 detection that utilise potentials of +700 mV vs an Ag/AgCl reference electrode are more prone to interferences as a result of higher recording potentials. To improve the selectivity of biosensor, techniques have been used, such as polymer coatings on platinum, polyaniline (2-3).

Platinum (Pt) electrode

Platinum is a very useful electrode for the detection of glucose and other neurotransmitters, and some modifications have been performed for the Pt electrode with carbon for improvement (51). The advantage of using a Pt electrode is that it permits a fast measurement and very fast preparation to enhance the sensitivity of the electrode (25).

Type of Membrane Layer

Recent biosensor research has designed an immobilisation and modification of electrodes. A suitable polymer must be selected as the immobiliser that may eliminate a variety of electroactive species which have the potential to act as interferents. Enzyme immobilisation

Glutaraldehyde Cross-linking

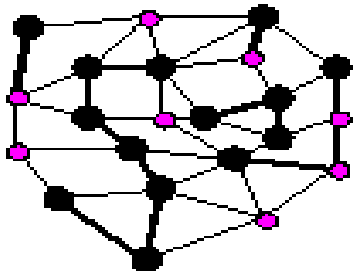

Figure: 2 Schematic representation of immobilization methods for biosensor construction● : enzyme molecule
● : crosslinker molecule

Cross linking is a widely used method of enzyme immobilisation. It is used to both stabilise the enzyme and provide a higher loading of active enzyme (3). At a basic pH,

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Effect of pH

pH is important for the electropolymerisation and activation of the enzyme. Most of the enzyme is active at a neutral medium during experiments using a phosphate buffer as a medium; the importance of pH for the reaction of phosphate buffer in terms of the development of a surface binding site for H2O2 from a precursor site through an interaction with $H2PO4^{-}$ from the electrolyte. A steady state response of the Pt electrode for H2O2 detection at a fixed potential (E = + 584 mV vs Ag/AgCl) with the concentration of 10 mM, pH range from 6 to 8, has the optimised current densities.

EFFECT OF CURRENT POTENTIAL IN ELECTROPOLYMERISATION

Researchers have studied the optimum current potential for electropolymerisation. Which suggests the best potential current for H2O2 sensitivity. This causes the selectivity against decrease as the current potential increases up to +700 mV. Although each study proposed a different optimum current potential, an investigation has determined the best current density range is for H2O2 to oxidise.Electrochemical biosensors always have an upper limit of the linear concentration range. This limit is directly related to the biocatalytic or biocomplexing properties of the biological receptor; however, in the case of enzyme-based biosensors, it may be significantly extended via an outer layer diffusion barrier to substrate S. The compromise for this extension in the linear concentration range is a decrease in sensor sensitivity. The local substrate concentration, within the reaction layer, can be at least two orders of magnitude lower than the bulk solution. In relation to the typical parameters for Michaelis- Menten kinetics, i.e., KM and Vmax, enzyme based biosensors are often characterized by their apparent KM and (Rss-Rbl)max: the first parameter represents the analyte concentration, which yields a response equal to half of its maximum value, (Rss-Rbl)max, for an infinite analyte concentration. When the apparent KM is substantially larger than its value for soluble enzyme, it indicates that a significant substrate diffusion barrier is present between the sample and the reaction layer or the rate of the reaction to the co-substrate S' with the enzyme is increased.As for the enzyme solution kinetics, the apparent KM is typically determined by Line weaver-Burk reciprocal plots, As for any electrochemical sensor, one should state the composition and the number of standards used and how the sample matrix is simulated. It may be necessary to specify procedures for each biosensor type and application.. The working concentration range, which may considerably extend the linear concentration range, is determined by the lower and upper limits of quantification [3-4].

SELECTIVITY AND RELIABILITY

Biosensor selectivity is determined and expressed as for potentiometric sensors. It depends on the choice of the biological receptor and transducer. Many enzymes are specific. When transducer interfering substances are well identified, their influence may be restricted by the application of appropriate inner or outer membranes.. The first method consists of measuring the biosensor response to interfering substance addition: a calibration curve for each interfering substance is plotted and compared with the analyze calibration curve under identical operating conditions. The selectivity is expressed as the ratio of the signal output with the analyze alone to that with the interfering substance alone at the same concentration as the analyze. In the second procedure, interfering substances are added, at their expected concentration, into the measuring cell, which contains the typical analyte concentration at the mid-range of its expected value. The selectivity is subsequently expressed as the percentage of variation of the biosensor response. Although more easily quantified than the calibration curve comparison performed in the first procedure, the second method is characteristic of each application and presents a more restricted significance. This selectivity may depend on the analyte concentration range, which is determined. The reliability of biosensors for given samples depends on both their selectivity and reproducibility. It must be determined under actual operating conditions, i.e., in the presence of potential interfering substances. A reliable biosensor response means that analyte concentration should not fluctuates with any interfering species within the sample matrix. Thus, for each type of biosensor and sample matrix, one should clearly quantify specific interference species that should be eliminated. This reliability determination is necessary for the accuracy assessment of biosensor.

REPRODUCIBILITY, STABILITY, AND LIFETIME

The definition of reproducibility is the same for electrochemical biosensors as any other analytical device: reproducibility is a measure of the scatter or drift in a series of observations or results performed over a period of time. In general, it is determined for the analyte concentrations within the usable range. The operational stability of a biosensor response may vary considerably depending on the sensor geometry and method of preparation, as well as the applied receptor and transducer For operational stability determination, we recommend consideration of the analyte concentration, the sequential contact of the biosensor with the analyte solution, temperature, pH, buffer composition, presence of organic solvents, and sample matrix composition.

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Finally, the mode of assessment of the lifetime should be specified, i.e., by reference to the initial sensitivity, upper limit of the linear concentration range for the calibration curve Biosensor stability may also be quantified as the flow, when the sensitivity evolution is monitored during either storage operational conditions. It is useful for biosensors for which evolution is either during a rather short period of time. [3-4]

CONCLUSION

The technical fundamentals of electrode, properties and performance must be understood. Biosensor responses will be controlled by the kinetics of recognition and transduction reactions.

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MILD, EFFICIENT SYNTHESIS OF 1-AMIDOALKYL 2-NAPHTHOL USING ETON'S REAGENT AT ROOM TEMPERATURE

Rupnar B. D., Shirsat A. J., Bhagat S. S. and Pawar R. P.[1]
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Chemistry, Deogiri College, Aurangabad (M. S.)
rupnarbd11@gmail.com

ABSTRACT
In present study, we have developed a mild, efficient protocol for the synthesis of 1-Aminoalkyl 2-Naphthol via a one pot three component reactions of aldehyde, β-Naphthol and acetamide by using Eton's reagent in ethanol as a solvent at room temperature. This procedure offers several advantages over reported protocol such as short reaction time, mild reaction condition, easy workup procedure and excellent yield.

Keywords: *multicomponent reactions, Amidoalkylnaphthols, acetamide, β-Naphthol.*

INTRODUCTION

Multicomponent reactions (MCRs) have gained much attention in organic synthesis, MCRshas several advantages over multistep synthesis, MCRs are one-pot processes in which three or more easily accessible components react to form a single product, which incorporates high atom economy[1].Multicomponent reactions (MCRs) have been an efficient and powerful tool in the modern synthetic chemistry. Isolation, purification and characterization steps for each intermediate will be removed under one-pot procedures.MCR has several advantages like, great efficiency and procedural convenience in the construction of complex structures from three or more reactants. In addition to this, MCRs are a promising and very important field in synthetic chemistry because synthesis of heterocycles can be achieved in anefficient,very fast,time and energy saving approachwithout the isolation of any intermediate.[2]

Amidoalkylnaphthols containing organic moiety exists in variety of effective drugs including a number of nucleosides, antibiotics and HIV protease inhibitors, such as lipinavir and ritonavir as well as in biologically important natural products. Amidoalkylnaphthols act as essential and important building blocks towards the synthesis of some organic compounds which possess excellent cardiovascular activity. Moreover this aminoalkylnaphthol containing metal complex has been used for asymmetric synthesis and also acts as a catalyst. In addition to this, these compounds exhibit antibacterial, hypotensive, and bradycardiac effects, etc. [3, 4].

Various method has been developed for the synthesis of amidoalkylnaphthols by three-component condensation of β-naphthol, aldehydes, and amides or different amine in the presence of Bronsted or Lewis acids such as p-TSA [5], $Fe(HSO_4)_3$ [6], H_2NSO_3H [7], $Sr(OTf)_2$ [8], $Al(H_2PO_4)_3$ [9],I_2 [10], $K_5CoW_{12}O_40{\cdot}3H_2O$ [11] and HPMo [12], Bronsted acidic ionic liquid [13], montmorillonite K_{10} [14], $HClO_4$–SiO_2 [15, 16] and cation-exchange resin catalysts like Indion-130 [17], Al_2O_3–$HClO_4$ [18]

Eaton's reagent is composed of 1:10 solution byweight of phosphorous pentoxide in methane sulfonic acid. It is an alternative to polyphosphoricacid because, it is easy to handle, and it has lower viscosity, inexpensive and simply removed from product by simply washing with aqueous sodium carbonate or water. A range of synthetic protocols were reported by using Eaton's reagent such as synthesis of Quinolone [19], synthesis of tetrahydro isoquinoline [20], chromenes and flavones [21], synthesis of mono and bis-chalcone derivatives [22],cationic arylation of aromatic carboxylic acids [23] andsynthesis of aryl mesylates [24]. Such successful catalytic activity of Eton's reagent has encouraged us to study its further application in organic synthesis. Herein, we desire to extend the synthetic applicability of such reagent for the synthesis of amidoalkylnaphthol.

EXPERIMENTAL

General Methods: All reagents, solvents and chemicals were purchased from SD fine chemicals used without further purification.All melting points are uncorrected and weredetermined on electrothermal Mk_3 melting point apparatus. Reaction progress was monitored by aluminum TLC plates. Infrared spectra were recorded (KBr pellets) on a Perkin-Elmer FTIR spectrophotometer 65, wave-numbers in the IR spectra are given in cm^{-1}.^{1}H NMR spectra were recorded on a 400 MHz FT-NMR spectrometer in DMSO-d_6 as a solventchemicalshifts had been expressed on the δ (ppm) scale downfield from TMSas an internal well-known reference.

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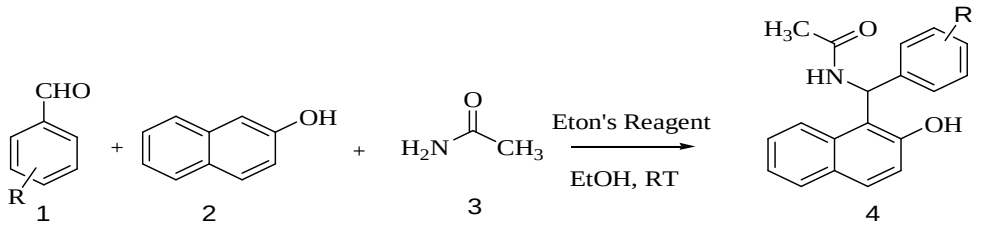
General procedure for the synthesis of Amidoalkylnaphthol

A mixture of aldehyde (1 mmol), β-naphthol (mmol) andacetamide (1.2 mmol) and Eton's reagent (20 mole %) in ethanol (2ml) was stirred at room temperature. The progress of reaction was monitored by TLC using ethyl acetate and pet ether as mobile phase. After completion, the reaction mixture was poured on crushed ice.The separated solid was filtered and washed with water several times. The residue was dried and recrystallized from ethanol to afford corresponding amidoalkylnaphthol.The products were confirmed by comparisons of melting points with authentic samples and spectral data such as IR, ^{1}H NMR.



Scheme 1

RESULT AND DISCUSSION

To promote environmentally friendly processes, first we choose β-naphthol (1), benzaldehyde (2) and Acetamide (3) as model reaction for the synthesis of amidoalkylnaphthol.Model reaction was carried out at room temperature in absence of catalyst and solvent; no desired product was obtained (Table 1, entry 1). Slight excess of the acetamidewas found to be advantageous and it gives desired product but in very less amount. Further model reaction was subjected to microwave heating; the desired product was formed in 10% yield (Table 1, entry 2).To increase the efficiency of reaction, the model reaction examined using 20 mol%Eton's reagent without solvent and the obtained desired product was 70% yield.No significant increase in yield was noted when the reaction was carried out with 25mol% catalyst.

Encouraged by these results, we further studied reaction in order to raise the yield of product.Model reaction was carried out using water, ethanol and methanol at room temperature and under microwave condition. It was observed that the uses of solvents in reaction media quicken the reaction rate and affords the preferred product in good yield than that for neat conditions. After screening a variety of reaction media, Eton's reagent in ethanol solvent were determined to be the best compared with reactions carried out in various polar solvent.

Table-1: Optimization of reaction conditions

Entry	Condition	Time	Yield %
1	Solvent and catalyst free, RT	3h	---
2	Solvent and catalyst free, MW	0.5h	10
3	Solvent free, Catalyst, RT	1h	70
4	Solvent free, Catalyst,MW	0.5h	60
5	H_2O, Catalyst, RT	1h	60
6	H_2O, Catalyst, MW	0.5h	55
7	EtOH, Catalyst, RT	1h	90
8	EtOH, Catalyst, MW	20 min	65
9	MeOH, Catalyst, RT	0.5h	82
10	MeOH, Catalyst, MW	0.5h	60

With the optimized condition in hand, we next explored the scope and generality of the model reaction. As shown in Scheme 1, a variety of substituted benzaldehyde was used for these protocol and we find that all benzaldehyde with electron donating and electron withdrawing groups were all suitable for the reactionsgivesmoderate to excellent yields.

Table-2: Preparation of 1-Amidoalkyl 2-Naphthol catalyzed by Eton's reagent

Entry	R	Time (min)	Yield (%)	M.P.(^{o}C)
1	H	60	90	240-241
2	p-CH_3	65	92	222-224
3	m-NO_2	55	96	255-257

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4	p-NO_2	45	97	244-246
5	p-Cl	55	94	230-232
6	m-Cl	60	92	236-238
7	p-Br	60	94	228-230
8	m-OH	70	90	203-205
9	p-OH	65	91	210-212
10	p-OCH_3	75	90	209-211

SPECTRAL DATA OF SOME REPRESENTATIVE COMPOUNDS

1)N-((2-hydroxynaphthalen-1-yl)(phenyl)methyl)acetamide:IR (KBr) (λmax): 3410, 3250, 2410, 1630, 1586, 1530, 1415, 1330, cm^{-1}. ^{1}HNMR (DMSO - d_6) 9.92 (s, 1H, OH), 8.25 (d, 1H, NH), 7.92-7.55 (m, 5H, Ar H), 7.50-7.24 (m, 6H, Ar H), 5.63 (d, 1H, NH), 2.10 (s, 3H, CH_3).

2)N-((2-hydroxynaphthalen-1-yl)(4-nitrophenyl)methyl)acetamide:IR (KBr) (λmax): 3415, 3235, 2420, 1645, 1565, 1522, 1430, 1310, cm^{-1}. ^{1}HNMR (DMSO - d_6) 10.05 (s, 1H, OH), 8.50 (d, 1H, NH), 8.10-7.68 (m, 4H, Ar H), 7.45-7.29 (m, 6H, Ar H), 5.78 (d, 1H, NH), 2.2(s, 3H, CH_3).

CONCLUSION

In summary, an efficient one-pot Eton's reagent mediated protocol for the synthesis of amidoalkylnaphthol skeleton from readily available substituted benzaldehyde, β-naphthol and acetamide has been developed.Clean and complete conversions leading to the corresponding amidoalkylnaphtholswere observed.

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EFFICIENT SYNTHESIS OF 4-THIAZOLIDINONE DERIVATIVES IN ETHANOL

Rupnar B. D., A. J. Shirsat, S. S. Bhagat and R. P. Pawar[1]
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Chemistry, Deogiri College, Aurangabad (M. S.)
rupnarbd11@gmail.com

ABSTRACT
A series of thiazolidinone derivatives have been synthesized via one-pot multicomponent reaction involving aromatic aldehyde, amine and thioglycolic acid in the presence of Eton's reagent in ethanol under reflux condition. The significant features of this method include short reaction time, operational simplicity, high yields and easy isolation of products.

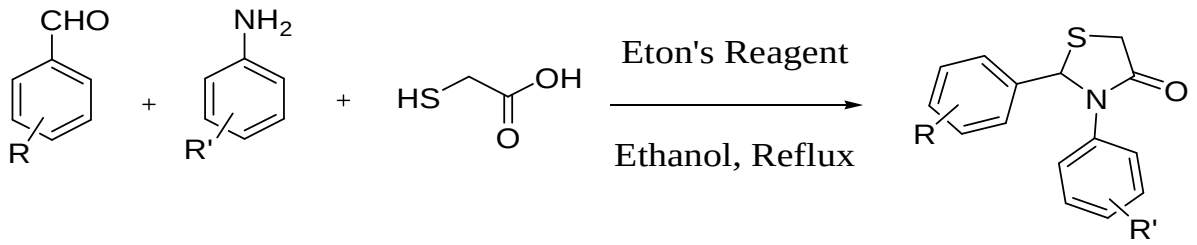
Keywords: *Thiazolidinone, thioglycolic acid, Eton's reagent, multicomponent reaction.*

INTRODUCTION
Compounds containing thiazolidinone plays an important role as a widely used pharmacophore and belongs to diverse scaffolds in medicinal chemistry [1]. They have found their uses as antiviral, antimicrobial, anti-inflammatory, anticonvulsant, antimalarial, anti-fungal [2], anti-tubercular [3,4], anti-HIV agents, anti-diabetic agents [5] and protein tyrosine phosphate inhibitors [6]. Among various thiazolidinone derivative, 4-thiazolidinone are one of the most studied thiazolidinone moiety in drug discovery and its design and majority of the biologically active thiazolidinone derivatives reported are 4- thiazolidinones [7-9]. Multicomponent reactions are key choice for organic synthesis due to operational simplicity, reduced steps and minimal waste generation [10].

In spite of their importance, various methods have been developed for the synthesis of 4- thiazolidinones by three-component tandem reaction between aldehyde, amine and thioglycolic acid in presence of various catalysts[11-17]. The reported method has its own merits and demerits, but some of these methods have certain demerits, such as use of organic solvents, long reaction times, utilize of specific conditions and tedious workup procedure. In this protocol we have developed a convergent synthesis of 4-thiazolidinone derivatives via one pot multicomponent reaction of aromatic aldehyde, aniline and thioglycolic acid using Eton's reagent in ethanol under reflux condition.

EXPERIMENTAL
All starting chemicals were purchased from Sigma Aldrich and used without further purification. Reaction progress was monitored by TLC on aluminium plates precoated with silica gel using Petroleum ether: ethyl acetate (7 : 3) as an eluent and visualized under UV light. Melting points were determined in open capillaries using Electrothermal Mk3 apparatus and are uncorrected. Infrared (IR) spectra in KBr discs were recorded using a Perkin-Elmer FT-IR spectrometer wave-numbers in the IR spectra are given in cm^{-1}. ^1H NMR spectra were measured on Bruker Avance II 400 MHz NMR spectrometer in DMSO-d_6 as a solvent and chemical shifts had been expressed on the δ (ppm) scale downfield from TMS as an internal well-known reference.

General procedure for the synthesis of thioazolidinone
A mixture of aromatic aldehyde (1, 1mmol), aniline (2, 1mmol) and thioglycolic acid was stirred in 5 mL of ethanol and Eton's reagent was added in a round bottom flask equipped with a magnetic bar and condenser. Reaction mixture stirred for 5-10 min at room temperature and followed by reflux for 1-2 h. Progress of the reaction was monitored by TLC on aluminium plates precoated with silica gel using Petroleum ether: ethyl acetate (8 : 2) as an eluent. After completion of reaction, the reaction mixture was poured into ice water to give a precipitate. The precipitate was filtered, washed with water, dried in air and recrystallized from ethanol to give respective products.



Scheme 1

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RESULT AND DISCUSSION

Firstly a model reaction was conducted using aromatic aldehyde, aniline and thioglycolic acid without any catalyst and solvent at room temperature (Scheme-1). It was observed that the reaction did not proceed well even until 12 h (Table 1, entries 1). Later, the reaction was performed in the presence of catalytic amounts of Eton's reagent (20 mol %) at room temperature but reaction did not proceed well, again this reaction carried out in reflux condition in the presence of different solvent at room temperature, the yield were again not inspiring (Table 1, entry 4-5). Further, the reaction was carried out in ethanol at reflux condition came out as the elevated conditions for the reaction in terms of yield and time (Table 2).

Table-1: Optimization of reaction condition

Entry	Condition	Time (h)	Yield (%)
1	Catalyst and solvent free at Room Temperature	12	-----
2	Eton's reagent, solvent free at Room Temperature	12	10
3	Eton's reagent, solvent free at Reflux	5	40
4	Eton's reagent Water at Reflux	4	45
5	Eton's reagent CH_3CN at Reflux	3	70
6	Eton's reagent Ethanol at Reflux	2	91

In a subsequent investigation for the substrate scope using the optimized reaction conditions, we found that various aromatic aldehydes and their corresponding products were obtained in high yields (Table 2).

SPECTRAL DATA OF SOME REPRESENTATIVE COMPOUNDS

1) **2-(4-nitrophenyl)-3-phenylthiazolidin-4-one** (4): M. P.139-140ºC, IR (KBr) cm^{-1}: 1672 (C=O), 1585, 1520, 1511, 1480, 1375, 1332; ^{1}H NMR (400 MHz, DMSO-d_6): 7.67-7.85 (m, 4H, Ar-H), 7.28-7.52 (m, 5H, Ar-H), 5.86 (s, 1H, C-H) 3.92-4.1 (dd, 2H, CH_2)
2) **2-(4-chlorophenyl)-3-phenylthiazolidin-4-one** (5) :): M. P.130-132ºC, IR (KBr) cm^{-1}: 1675 (C=O), 1595, 1520, 1453, 1370, 730; ^{1}H NMR (400 MHz, DMSO-d_6): 7.73-7.87 (m, 4H, Ar-H), 7.15-7.45 (m, 5H, Ar-H), 5.9 (s, 1H, C-H) 3.95-4.2 (dd, 2H, CH_2)

Table-2: Synthesis of 1,3-thiazolidin-4-ones using Eton's Reagent under reflux condition

Entry	R	R'	Time (h)	Yield (%)	M.P.(ºC)
1	H	H	2	91	132-134
2	p-CH_3	H	2.5	88	122-124
3	m-NO_2	H	2	92	177-179
4	p-NO_2	H	1.5	95	139-140
5	p-Cl	H	1.5	91	130-132
6	m-Cl	H	2	90	136-138
7	p-CH_3	p-Cl	2	89	178-180
8	m-NO_2	p-Cl	1.5	92	184-186
9	p-NO_2	p-Cl	1.5	94	163-165
10	p-Cl	p-Cl	2	90	209-211
11	m-Cl	p-Cl	2.5	92	195-197

CONCLUSION

We have developed a protocol for the convergent synthesis of 4-thiazolidinone derivatives via one pot multicomponent reaction of aromatic aldehyde, aniline and thioglycolic acid using Eton's reagent in ethanol under reflux condition. The present protocol has several advantage over reported protocol, such as mild reaction condition, good functional group tolerance, excellent yield and easy workup procedure.

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GANDHIAN THOUGHTS ON SATYAGRAHA

Satale S. N.
Department of Political Science, R. B. Attal College, Georai, Dist. Beed (M. S.)
satalesn9969@gmail.com

ABSTRACT
Mahatma Gandhi, The greatest son, the valuable diamond of the Indian soil, was a man of action, His concept of satyagraha shows the new direction. To make the world better. Should be the goad of every human being every human being should behave with humanity. But unfortunately modem world had forgotten this fact. Now a days, there is no country or not a part of world away from danger culled terrorism- every day we got a news of boom-blast which shakes our sprite for silence satisfaction today, There is need of Gandhi an Thoughts.

Keywords: *Satyagraha, non-violence, non-cooperation, strike Herat, civil disobedience*

INTRODUCTION

Mohandas Karamchand Gandhi, the 'Father of the Nation, and the ' Architect of Modern India, respectfully, addressed and remembered as Mahatmaji, was born on the cross-roads of our history and gave it a purposeful direction. He made his mark as protestor, social worker, reformer, thinker and as the liberator. The political guise in which he appeared before the world he did not own. He was religious, humanist and the "practical idealist". He accepted life in all its comprehensiveness. A keen student of human affairs as he was, he expressed himself on problems that he and the contemporary society confronted the most. Hes' 'thought' is, therefore. Not academically cut and set. It is not free from inconsistency. In his postulations he has drawn upon the ancient heritage and philosophy. It has been to him, as to many others, the fountain of freshness and the ever bubbling source of ideas, To most of us, for our ignorance of our heritage, and for being conditioned by the western political thought, his writings couse pouzzlement and contradiction. The effect, however, wears away, as deep in our mind, there is the ancient impact on our silent response to it. Our ancestors did not live only to die, or to be born again and again as the populist belief goes. They had developed the ideas suitable to thir conditions.

HIS CONCEPT OF SATYAGRAHA AND NON-VIOLENCE

Gandhiji attached too much importance to non-violence. He reached non-violent resistance, named satyagraha to fight out British imperialism from India. Even when Czechoslovakia was invaded by Hitler, he advised Czechs to resort to non-violent resistance. He says : "We have to make Truth and non-violence not matters for mere individual practice, but for practice by groups, communities and nations. That, at any rate is my dream. Ahima (non-violence) is the attribute of the soul, and, therefore, to be practiced by everybody in all the affairs of life. " He further says, "I swear by non-violence because I know that it alone conduces to the highest good of mankind, not merely in the next world but in this also. I object to violence because when it appears to do good, the good is only temporary, the evil it does is permanent."

In this postulation he has drawn upon the ancient heritage and philosophy. It has been to him as to many others, the fountain of freshness and the ever bubbling source of ideas. To most of us. For our ignorance of our heritage, and being conditioned by the western Political thought, has writings cause puzzlement and contradiction. The effect, however, wears away, as deep in jour mind; there is the ancient impact and our silent response to it. Our ancestors did not line only to die, or to be born again in our mind, there is populist belief goes. They had developed the ideas suitable to their conditions. The westerners that has come between our heritage and our selves makes often difficult for us, to make a rational and positive study of these ideas. Gandhi firmly believed that some of the ancient ideas can still helpful in resolving some of our problems. The concept and patterns that the terms like Varna, karma, satya, Shicsa. Aparigraha, sambhava saradeya and dharma etc, convey are interesting and refreshing. Gandhiji used there in positive and meaningful way: not necessarily as understood popularly.

Gandhi developed his theory of Satyagraha in the light of the experience he gained from different political movements. he claimed that his Satyagraha was continuously developing in response to the development of truth. He wrote " I have ventured to place before Indian the ancient law of self sacrifice. For satyagraha and its off shoots, non-co-operation and civil resistance are nothing else but new names for the law of suffering.

It does not mean submission to the will of the evil trait. In South Africa Gandhi used the method of Satyagraha to fight unjust laws of the white government. He decided to use Satyagraha which implied holding on to truth with love and firmness. He maintained that Satyagraha was based upon truth and soul force of the individual.

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Satyagraha was first conceived by Gandhiji in South Africa as a means of meeting the political grievances of South African Indians. Maganlal Gandhi suggested the term 'sadagraha' Gandhiji accepted it, with bit change and called it, 'Satyargraha' the word ' Satyagraha' is composed of two words of Sanskrit. Satya means truth and Agraha means adherence. Therefore it means' adherence to truth.

This spiritual or moral weapon was employed in a more comprehensive and wider sense; and solved most of the human problems. Satyagraha, according to Gandhiji is the implementation of truth and ahimsa in different walks of life. Truth and ahimsa are virtues not merely of the individuals but of the whole humanity.

Gandhiji was the first human in history to extend the principle of non-violence. Non-violence and truth can't be separated. They are two sides of the same coin, Non-violence is the means and truth is the end. Gandhiji taught us not to hate sinner but to sin and love thy enemy. It is based on the conviction that the universe is on the side of justice.

He launched the ' Dandi march' and gave message of the freedom. It reached every corner of India. He demanded complete freedom that is ' Swaraj' Dandi March' created an atmosphere of freedom all over the country. 'Quit India' was also the non-violent experiment and 'Do or Die' mantra also given by him. India won independence on 15 Aug. 1947. It is the wonder for the world that independence can be achieved by non-violent means of Satyagraha. Gandhiji.

Adopted his unique technique of Satyagraha. Satyagraha is the relentless pursuit of truthful ends by non-violent means. Gandhiji emphasizes the means. According to him, means are very valuable. Satyagraha for Gandhiji, is a weapon of conversion, no of coercion.

Gandhiji took recourse to the different methods of Satyagraha during his life time for the success of Satyagraha movement. He laid down the following techniques of Satyagraha.

Gandhiji approved non-co-operation as a technique of Satyagraha in September, 1920 in the special session of the Indian National congress at Kolkata to secure redress of Punjab and Khilafat wrongs. Non cooperation should be employed mainly in four stages. Viz, giving up of titles and resignation of honorary posts, calling out of Government servants, the withdrawl of the police and the military and suspension of taxes.Non-co-operation is a means of self purification and achieving swaraj.

Peaceful picketing is another means of Satyagraha. Its aim was to put social, economic and political pressure on the Govt. and to create political consciousness and swadeshi spirit amongst the sale and use of foreign cloths and liquor shops.

Strike as a technique of Satyagraha, was employed by Gandhiji to solve labor's problems. This is especially a weapon of the labourers for fulfilling demands of a suitable living wage from the employer.

Gandhiji used Hartal as a technique of Satyagraha. It is a spiritual weapon of business grievances. Gandhiji introduced the boycott in social, economic and political spheres, Boycott was employed on foreign cloths and goods. Schools, colleges and official functions were also boycotted and Gandhiji introduced Khadi.

Hajirat, foot march, No-Tax comparing, self-suffering and moral force, fasting all these are the weapons of Satyagraha.

Civil disobedience, in the view of Gandhiji, should be undertaken as a last resort when all the methods of Satyagraha are employed and they fail civil disobedience becomes a sacred duty of the citizens when the state becomes a sacred duty of the citizens when the state becomes lawless. This technique was used by Gandhiji in 1920 for Khalifat wrongs, 1930 for Swaraj and soon.

All the methods mentioned above are non-violent and it is the best remedy for the liberation from foreign oppression. Gandhiji used it successfully. According to him violence is the worst one.

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A STUDY OF FAMILY CYPERACEAE FROM SAKUNA DAM, AURANGABAD DISTRICT OF MAHARASHTRA, INDIA

Solanke S. N. and Pangrikar P. P.[1]
Department of Botany, Shri Muktanand College, Gangapur, Aurangabad (M. S.)
[1]Department of Botany, R. B. Attal College, Georai, Dist. Beed (M. S.)
sudhir197932@gmail.com

ABSTRACT
The paper gives an account of sedges of the Sukhana Dam, Aurangabad District. A total of 28 species under 5 genera were collected and identified during the year 2016 for the first time. Genus Cyperus found dominant having 11 species and Fimbristylis followed by Scirpus (4 species) Bulbostylis (2 species), and Pycreus have 3 species each. Species were spread widely in marshy places. The species are used economically as animal food, medicinal; while some as environmental.

Keywords: *Cyperaceae, Key, Sakuna Dam*

INTRODUCTION

In Aurangabad district, Sukhana dam is created on Sukhana river at Garkheda, Tq. & Dist Aurangabad. It is about 32 km away from Aurangabad city of Maharashtra. It is about 3536 m in length and 18.92 m in height. The gross storing of water is 21,340,000 m^3. It is an earthen dam, chiefly constructed for irrigation purpose on the river Sukhana. The dam is having good capacity of water storing. The relative humidity may reach 85%. Maximum temperature during summer is about 44°C minimum temperature during winter is 26°C. The mon soon starts inthisareafromJune and rain continuous up to end of September. The winter season starts from November toFebruary.

Thereareabout16mediumirrigationprojectsinthisdistrict.of these,Sukhana dam is biggest so far as its capacity of water storage is concern. Therefore, this wetland is particular for the study of sedgesdiversity.

The sedge family is the third largest monocot family, globally it consisting of an estimated 5000 species in 104 genera. They have a cosmopolitan distribution, especially in tropics. The largest genera (approximate numbers of species) *Cyperus*, 550 spp. (excluding *Kyllinga* and *Pycreus*); *Fimbristylis*, 300 spp;and *Scleria*, 250 spp. eachand *Bulbostylis*, *Pycreus.*

The family has considerable economic importance; many members are serious agricultural weeds, whereas others provide animal food, etc. Cyperaceae also have conservation and environmental importance. They are major or even dominant workings of wetland habitats. The decline of sedge species within different types of habitats is a useful indicator of potential habitat damage. In terms of ecosystem services, they can play a particular role in the maintenance and improvement of water superiority. Constructed wetlands, artificial marshes or swamps created for anthropogenic discharge such as wastewater, storm-water, run off or sewage treatment in various parts of the world have included Cyperaceae species. Work on family Cyperaceae in different parts of India were carried out by several workers like Haines (1924),Sabnis (1960), Rao andVerma (1981),M. A. Wadoodkhan (1999).

MATERIAL AND METHOD

A concentrated Sakuna Dam region survey of Cyperaceous members growing throughout the Sakuna Dam region was carried out during January 2015 to January 2016. Frequent visits were made to assess the flowering time of these species. The fresh plant specimens were collected at the flowering stage and other relevant information e.g., location, date, habitat, association, etc. were recorded. Plant samples were properly dried for making voucher specimens and critical morphological studies have been made and different floras and monographs have been accessed to identify the sedge species. The plants were processed into voucher specimen following standard methods. After the work is over voucher specimens were deposited in Department of Botany, Solanke Sundarrao College, Majalgaon, Dist. Beed for futureuse.

RESULT AND DISCUSSION

The present study revealed 5 genera and 18 species of sedges growing in Sakuna Dam, Aurangabad district which are presented in the form of genera and species key. Genus *Cyperus* found dominant having 11 species followed by *Scirpus* (4 species), and *Fimbristylis* (8 species) while *Bulbostylis* and *Pycreus* have 1 species each. Species were distributed widely in grass fields. The species are used economically as animal food; while some as environmental.

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KEY TO THE GENERA

1. Glume fertiledistichously arranged:

2. Stigma 3 rarely 2, nutlets trigonous, glumes not winged.....***Cyperus*** 2. Stigma 2, nutletstwosided ……. ***Pycreus***

1. Glumes spirally arranged:

3. Style base limited or articulated above nut:

4. Style flat hairy,usuallypersistent……..***Fimbristylis***

4. Style linear, glabrous and usually deciduous..... ……***Bulbostylis***

3. Style base neither limited nor articulated, bristle uniformscalelike ……..…….***Scirpus***

Key to genus *Bulbostylis*

1a. Stems 0.25-0.4 mm thick, heads with 2-20 spikelets; glumes 1.5- 2. 25 mm long, glabrous or almost ciliolate or puberulent in upper part, not withbulbous based hairs, short mucro. .....

……...**B. barbata** subsp. **barbata**

1b. Stems 0.5-1 mm thick; heads with numerous spikelets, dense, glumes 3-3.5 mm long wholly subdensely pilose from bulbous base hairs, with ca 0.6 mm long recurvd mucro.....**B. barbatasubsp. pulchella**

Key to genus *Cyperus*

1. Spikelets digitate, stellately arranged; rhachis much shortened or condensed forming clusters, sometimes solitary ones often added or inflorescence capitate:

2. Head or cluster of spikelets single, terminal or pseudolateral; rays absent:

3. Spikelets numerous, densely and closely crowded, indistinct, not easily recognizable; glumes muticous or with 0.3-0.4 mm long mucro.....**C. squarrosus**

3. Spikelets 3-15, distinct from one another, digitately arranged, stellately spreading; glumes with 0.7-1 mm long mucro, (short in *C. niveus*).....… **C. rubicundus**

2. Heads or the clusters 2-many on primary or secondary rays or in decompound umbels:

4. Stems triquetrous with concave faces, almost 3-winged; spikelets numerous crowded in globose heads; glumes very small, 0.5-0.8 mm long, as long as, broad, often emerginate at apex, nuts almost as long as the glumes …….....… **C. difformis**

4. Stems triangular, multiangular, or if triquetrous then not 3-winged as above; spikelets up to 16 on the rays, digitately arranged; glume 1-2.5(3) mm long, longer than broad, not or rarely emerginate; nuts smaller than the glumes.....**C. tenuispica**

1. Spikelets spicately arranged at some distant from one another upon a more or less elongated rhachis:

5. Spikes oblong or cylindrically oblong, several times longer than broad. Spikelets many to numerous (more than 25); rhachis visible or invisible …….....**C. exaltatus**

5. Spikes ovate, as long as broad; spikelets 3-15 on distinct rhachis:

6. Rhachilla distinctly winged; sides of glumes nerved or nerveless:

7. Plants leafless or leaves reduced to bladeless sheaths, rarely with short 5 -7 cm long solitary blade. ……**C. scariosus**

7. Plants leafy:

8. Glumes distinctly 7-11 nerved, equally spreading over the whole breadth near to the margins; inflorescence simple small or reduced to a spike or imperfect with short, 2-3 cm long rays:

9. Stems arising from bulb-like tubers which are covered with striate, coriaceous glabrous coat, soon splitting in to black segments; involucral, bracts distantly one above the other, the lowest often little, *ca* 1 mm distant below. spikelets dark brown or chest nut purple or pale; inflorescence reduced with rays 2-3 cm long; glumes 9-11 nerved. Stolons blackish, capillary, soon disappearing.....…**C. bulbosus**

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9. Stem base not bulbous; tubers solid, covered with grey tomentum; involucral bracts close set, not spaced as above; spikelets yellowish-brown, bright. Inflorescence well developed, dense with up to 15 cm long rays; glumes 7-9 nerved. Stolons yellowish long persistant.....…**C. esculentus**

8. Glumes distinctly or indistinctly 5-7 nerved, sides almost with 2-3 nerves close to or much less prominent from the keel; inflorescence simple to subcompound, large with 10-15 cm or small 5-6 cm long rays:

10. Spikelets turgid, subterete or subangular; nuts strictly broadly ellipsoid, obtuse at both ends with one face flat and concave (depressed) in centre, black, shiny; styles indistinct or up to 0.5 mm long.....**C. stoloniferous**

10. spikelets strongly compressed; nuts obovoid or ellipsoid, often narrowed towards base, equally trigonous, grey-whitish, orange-yellow or dark brownish, not black; styles 1 mm or more long.…..… **C. rotundus**

6. Rhachilla of spikelets wingless; sides of glumes often nerved.…… **iria**

Key to genus *Fimbristylis*

KEY TO THE SPECIES

1. Style 2-fid, nuts, biconvex or lenticular:

2. Glumes partly or wholly densely brown greyish tomentose on the back:

3. Annual, spikelets rusty brown, glumes wholly pubescent on the back, 1.5-2.8 mm long, gynophore very short, 0.1 mm long; styles sparsely fimbriate ……..... **F. pubesquama**

3. Perennials with woody rhizome; spikelets greenish-brown or ferrugineous;glumes tomentose in upper half on the back; 3.5-4.2 mm long, nuts broadly obovate, 1-1.2 mm long gynophore obdeltoid, 0.2-0.3 mm long; styles densely fimbriate throughout:

4. Lower sheaths brownish, shining; blades or cauline leaves up to 10 cm long 0.5-1.5 mm wide; involucral bracts usually shorter than the inflorescence; spikelets acute……..... **F. ferruginea**

4. Lower sheaths herbaceous; blades of cauline leaves up to 30 cm long, 1.5-2 mm wide, lowest involucral bract usually overtopping the inflorescence; spikelets obtuse…….....……..... **F. sieberiana**

2. Glumes glabrous …….....**F. alboviridis**

Styles 3-fid, nuts trigonous or triquetrous: Glumes densely red gland dotted on the back ...…..... **F. adenolepis**

5. Glumes not gland dotted: Cauline leaves reduced to bladeless sheaths; leaves of sterile shoots (lateral to stems) well developed or altogether absent.....**F. quinquangularis**

6. Cauline leaves well developed, long bladed: Stems strongly compressed; ancipitous (2-sided) .....**F. microcarya**

7. Stems neither compressed nor ancipitous, sometimes almost flatty trigonus (dipterous).....… **F. cymosa**

Key to genus *Pycreus*

1. Glumes awned or distinctly mucronate:

2. Sides of glumes with 1-3 nerves; Spikelets ovoid or subglobose in outline, involucral bract 2 ..... **P. nervulosus**

2. Sides of glumes nerveless; Spikelets linear oblong, usually congested and capitate; globose, straight, involucral bracts 3-5. .....**P. pumilus**

1. Glumes always muticous ……..…….....**P. sanguinolentus**

Key to genus *Scirpus*

1. Leaves well-developed; involucral bracts 2-5, foliaceous, dorsiventrally flat (or absent in *S. fluitans*) …….....… **S. maritimus**

1. Leaves reduced to sheaths, rarely shortly laminate (sometimes stems are leafy in *S. lateriflorus* or up to 2 cm long mucronate blade in *S. subcapitatus*):

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2. Hypogynous bristles or scales present; amphicarp absent …….. **S. littoralis**

2. Hypogynous bristles or scales absent; amphicarp (female flower with very long style within the basal sheaths) often present.:

3. Stem solid, terete or angular, not septate; spikelets atleast partly peduncled and on short rays; nuts with strong transverse wavy ridges extending beyond angles giving muricate appearance ……..….....**S. lateriflorus**

3. Stems hollow, terete, faintly to strongly septate (when dry); spikelets all sessile in capitate heads; rays absent; nuts smooth or faintly to strongly undulated but never appearing muricate on angles..... **S. praelongatus**

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COMPLEXATION OF Pr (III) WITH 5-BROMO-2-HYDROXY ACETOPHENONE AT VARIOUS TEMPERATURES AND SOLVENT COMPOSITIONS

Ubale S. B.
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed (M. S.)
drsanjayubale@gmail.com

ABSTRACT
In the present study the interactions of Pr (III) with 5-bromo, 2-hydroxy acetophenone at different temperatures (30, 40, 50,& 60^{0}C) were reported. The proton ligand (pK) & metal ligand stability constants (logK) were determined at 0, 25, 50 & 75% dioxane-water mixture solution by employing Bjerrum – Calvin method1. The systems were studied by maintaining M:L ratio 1:1 & 1:2.

Keywords: *Praseodymium (III), 5-bromo-2-hydroxy acetophenone, complexes, stability constant.*

INTRODUCTION
A complexation study is a very important aspect from research point of view. The research work on it study has received the attention of many researchers in recent years[2-4]

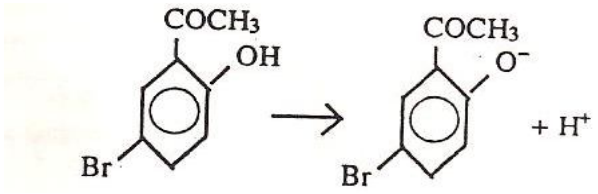
The ligand is binded to the metal ions by coordinate bonds. The extent of how much the ligand binds a metal ion can be expressed in terms of stability constants.5,6 . It can be determined by making use of Potientiometry, Polarography, Spectrophotometry, etc.

An attempt has been made to report the stability constants of Pr (III) with 5-bromo-2-hydroxy acetophenone by using pH-meter.

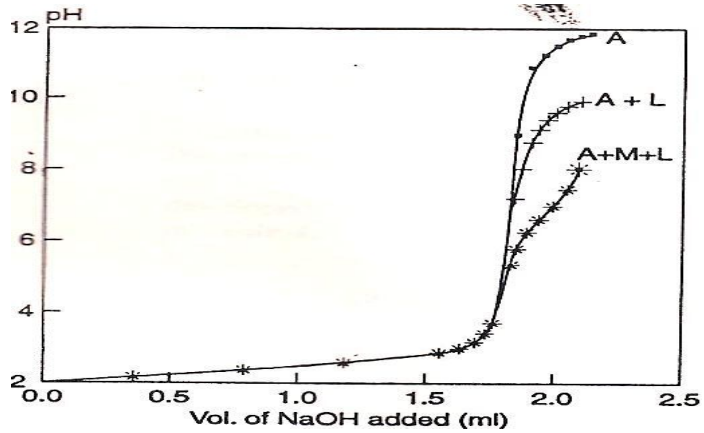
EXPERIMENTAL
S.D.Fine, AR grade chemicals were used for the experimental purpose. Double distilled water (pH 6.7-6.8) was used for the preparation of the solutions. 5-bromo-2-hydroxy acetophenone was used as a ligand. It was prepared from 4-bromophenol by the Fries migration method as described in the literature[7]. pH meter (Elico LI-120 pH meter 51) was used to determine the experimental data.

RESULTS AND DISCUSSION
Proton-ligand stability constant was determined by out by the point wise calculations and confirmed by half integral method and least square method. The ligand has only one binding site. It was observed that there is we observed only one neutralization point; hence only one pH value was determined.

5-bromo-2-hydroxy acetophenone ionization can be represented as:



It was observed that the metal-ligand curve was well separated as shown in Fig.1. It proves that the proton has been liberated as the complex forms. The metal ligand stability complex (log K) was calculated by point wise method. The value of log K1 refers to 1:1 complexes & that of log K2 as 1:2 complexes.



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A=Acid($HClO_4$); L=ligand (5-bromo-2-hydroxy acetophenone);M=metal (Pr (III) nitrate);ionic strength=0.1M.

The values of them are represented in Table 1 & 2 respectively.

Table-1: Proton -Ligand Stability Constant of 5-Bromo-2-Hydroxy acetophenone

pH	pK
8.50	9.118542
8.65	9.146648
8.75	9.178479
8.90	9.235617
9.00	9.249482
9.10	9.277968
9.20	9.308776
9.30	9.321712
9.40	9.325950
9.50	9.341229
9.60	9.391121
Mean pK	9.26

Table-2: Metal-Ligand Stability Constant of Pr (III) with 5- Bromo,2-hydroxy acetophenone:

Compositions of dioxane water mixture solutions	log K1	Log K2
0%	6.05	5.26
25%	6.22	5.72
50%	7.94	7.21
75%	10.40	9.67
Mean	7.6525	6.965
Least square method	8.0937	7.192
Standard deviation	0.1303	0.1923

Effect of Solvent

The effect of solvent was determined in 0%, 25%, 50%, 75% dioxane-water mixture solution of 5-Bromo-2-hydroxy acetophenone. The practical pK values are converted into thermodynamic pK values using Van Uitert[8] correction factor.

Table-3 represents the practical pK & thermodynamic pK values of 5-bromo-2-hydroxy acetophenone.

Table-3: pK & log K values of 5-Bromo-2-hydroxy acetophenone

Dioxane-water (%)	pK(Experimental value)	pK(Thermodynamic value)
0	8.76	--
25	9.25	9.43
50	9.74	10.30
75	10.58	12.48

The log K values of Pr (III) 5-bromo-2-hydroxy acetophenone were determined in 0, 25, 50 and 75% dioxane-water. The values of them obtained by point wise calculations are represented in Table-3.

It was observed that proton-ligand and metal-ligand stability constants increase with increase in composition of dioxane-water system.

In the present investigation, the pK values refer to the release of a proton from phenolic (–OH) group present in the side chain of the structure.

It was observed that with the increase in dioxane percentage, there is decrease in acidity of ligand. Secondly log K values increases with the increase in dioxane percentage.

This can be explained on the basis of solvation of anion obtained after dissociation and ligand field stabilization. This is in agreement with other workers[9, 10]

Increase in pK values and log K values might be due to decrease in dielectric constant of medium, effect of bulk solvent and specific solute-solvent interactions.

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Effect of Temperature

It was also decided to study the effect of various temperatures, viz., 30, 40, 50 and 60°C, on pK values. A technique called as Continuous titration technique developed by Pethe-Mali[11] was adopted for the experimental purpose.

The pK values are represented in Table-4.

Table-4: pK values of 5-Bromo-2-hydroxy acetophenone at different temperatures

Temperatures	pK (Experimental values)	pK (Thermodynamic values)
30	**9.74**	**10.30**
40	**9.64**	**10.20**
50	**9.51**	**10.07**
60	**9.39**	**9.95**

CONCLUSION

The data provided in Table 4, it is observed that pK and log K values increase with the increase in composition of dioxane- water.

It was observed that, the pK values refer to the release of proton from phenolic-OH group present in the side change of the structure.

It was also observed that as there is increase in dioxane composition, there is decrease in acidity of ligand.

Log K values increases with the increase in dioxane percentage. This can be explained on the basis of solvation of anion obtained after dissociation and ligand field stabilization. This is in agreement with other workers (as mentioned earlier).

The stability constants of 1:1 and 1:2 Pr(III)-5-Bromo,2-hydroxy acetophenone complex as mentioned in Table 2 is less than 1 (one) for 0%,25%,50%, and 75% dioxane water mixture solutions.

It is also observed that the values of log K1 are greater than K2.

It was decided to just report the values of log K2, as no references in concern were available.

Increase in pK values decrease with increase in temperature. This is in agreement with Pitzer[12]. The various thermodynamic parameters are calculated using the above data. The value of ΔH (-4.53 kcal/mole) and positive value of ΔG (14.28 kcal/mole) indicate the dissociation of ligand into ions to be a thermodynamic process but not a spontaneous and favorable process. The negative value of ΔS (-29.27 cal/mole/degree) is expected since after ionization the water molecule gets systematically oriented around the ions. The formation of ions, therefore,is bound to produce more order in water structure leading to negative values of S.

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A STUDY OF TOURISM AND HOSPITALITY MANAGEMENT: IN THE CONTEXT OF EMERGING ECONOMIC GROWTH IN INDIAN ECONOMY

Vanjari S. B.
Department of Commerce and Management Science, R. B. Attal College, Georai, Dist. Beed (M. S.)
vanjarisb2015@gmail.com

ABSTRACT
Tourism is the important segment of economic growth of the India. It is one of the largest sources to generation of employment and foreign exchange. Hospitality management includes many different allied sectors which works and creates many opportunities for the economic growth such as travels and tours, event management, wedding planning, health and safety, interior designing, customer services, beauty therapy, marketing management, tourist guide etc. The government has taken several steps in the regards of hospitality sector in India with different campaigns such as Incredible india and schemes like swadesh darshan. The government is expecting to achieve one percent share in world's international tourist arrivals by 2020 and two percent share by 2025. India has a great historical background of culture, arts, geographical environment etc. India is one of the famous for tourism in the word.

Keywords: *Tourism, Hospitality management, Market, etc.*

OBJECTIVE
This paper describes the nature of hospitality management, its functions and future opportunities to economic development of India. We also takes some figures to compare the hospitality market to position in India of different years through which we can analyze really India has great future of hospitality market. This paper is also trying to highlight challenges before hospitality market which they can face during the future progress.

RESEARCH METHODOLOGY
This Research Paper is constructed on the basis of Secondary data which are collected from various sources includes different articles, Journals, Magazines, Periodicals, Research Works, News Papers, web sites of government of India for online market and all the research related Web sites.

INTRODUCTION
Meaning of Hospitality management : "It refers to the application of management concepts and structured leadership in the areas of accommodation, dining and general guest services. From the largest hotels to the smallest cafeterias, all such businesses form an important part of the hospitality industry".

Tourism industry is associated with many secondary industries which make different effect on the Indian economical issues such as employment, entrepreneurship, development etc. Tourism management simply refers to keep it in better ways for the betterment about tourism and their pros and cons.

FOLLOWING ARE THE MAJOR ADVANTAGES OF TOURISM MANAGEMENT:-

Huge amount of Economic generation
As many industries connected with tourism industry it make huge amount from their business which is helpful to the overall economical growth of the economy.

More job opportunity
More people have the more job opportunities which are solving the problem of unemployment in the country. Many sectors require different type of manpower for different work that creates number of opportunities of employment in the country.

The natural, cultural, historical heritage and resources will be preserved
India is only one country in the world where different nature, culture and historical heritages are available. Many tourists from across the world are attracting to the India and it has been great opportunity from last many year to the development of India.

Preservation of Natural resources
Due to tourism is the source of employment and amount generation to the economy of the nation, government as well as the entire concern sector continuously taking efforts to preserve natural resources and culture.

Infrastructure development
Tourist comes from the different nations to travel and visit the country. To make pleasant visit of tourist to the country government need to develop the infrastructure for the fulfillment of different tourist's requirement. It helps to infrastructural development and economical growth of the country.

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Other than above advantages some of the advantages can be revealed awareness increments to all peoples as the importance of tourism, The proper laws and policies Will be implemented, Carrying capacity mitigate, More numbers of tourists can attracts towards country, The tourist length of stay increased, The effective promotion and marketing of country and to explore the new tourism destinations etc., In sum up, the tourism management is indeed required for the quick and better development of tourism in the nation and to make sustainable development.

CHALLENGES BEFORE THE TOURISM SECTOR

As a leading sector of economy of the nation tourism sector has some challenges to the development and growth in future. Different type of problems facing by the tourism sector some of them explain is as under.

Government rules and regulations

Government regulations in India frustrate tourists and tour operators alike, with ever-shifting visa rules that can leave visitors in the lurch and create inconsistent enforcement. Many have called for India to start offering visas on arrival, like other nations competing for tourist dollars.

Infrastructure Problem

The tourism industry is also weighed down by infrastructure problems once visitors arrive, including inadequate roads, water, sewer, hotels and telecommunications. Airports have been expanding in an effort to accommodate more passengers.

Women's safety

India tour operators reported a 25 percent drop in business over the first quarter of 2013 after the high-profile slaying of a 23-year-old woman who was gang raped riding a bus in Delhi the previous December. With the case inspiring other victims of sex crimes to bring their stories into the light, the Associated Chambers of Commerce and Industry of India said female tourism dropped by 35 percent that same quarter. The U.S. State Department reports a "modest increase" in violent crime against foreigners and cautions women against traveling alone in India, using public transportation after the sun has gone down and going to isolated areas.

Lack of Skilled worker

Tourist facilities have a lack of skilled employee to fill all the positions to cater to international visitors.

High Tax Policies

Service, luxury and transportation taxes are high, and hit visitors in the pocketbook when planning a trip to India.

Society Security Issues

India is in a constant state of tension with its fellow nuclear neighbor, Pakistan, and the U.S. government has long warned travelers to avoid the restive border and disputed Kashmir. The threat of terrorism to tourists hit closer to home in the 2008 Mumbai attacks, when gunmen fired on a train station platform, cafes and luxury hotels; the victims included 28 foreigners from 10 countries. Since then, smaller-scale bombings conducted by Islamic extremist and insurgent groups have continued against some public places frequented by Westerners. Tourists have to wade through a continually shifting slate of warnings. U.S. citizens with Pakistani bloodlines who try to obtain a visa for India feel the weight of this extra security in the additional wait time they experience for entrance approval.

Concerns about Industry Growth

Despite the influx of overseas cash that tourism brings to a country, one challenge for the tourism industry in India comes from within. Concerns about the potentially negative impact of tourism here include economic boons for some areas but not others and resulting migration of workers, underemployment caused by seasonal work, inflation as tourists drive up prices and preferences given to tourists for supplies such as water rations.

Environment effect

There are also concerns about the environmental impact of tourism on an already crowded country and the potential wearing down of cultural monuments from overuse.

CONCLUSION

Tourism sector is becoming one of the important segments of the Indian economy. Therefore, it is developing with all allied sectors due to that this paper is focused on the importance and challenges of tourism in India in order to look into this important aspect in the development of economy. The study is showing that the tourists are satisfied with tourism in India or what they are expecting from the government and what government need to do to develop the tourism sector in future time. The government need to exert more effort and undergo more

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studied plans to improve tourism and make individuals aware of its importance and how to best utilize it for the good of the country's economy, be it an tourism within and outside the country.

SUGGESTIONS

Following are the suggestions which this paper want to suggest.

1. Indian government should have to create the awareness of importance of tourism among the society through implementing different tourism awareness program.
2. To make tourism awareness to the peoples from his child age, for that tourism syllabus should be included in the school, colleges and university.
3. Need to maintain proper and very alert customer support service to the tourist to make good effect on the tourism.
4. Need to offer good tax policies and safety assurance to tourist to develop tourism sector in India.

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CHALLENGES BEFORE IMPLEMENTATION OF DIGITAL LITERACY

Vanjari S. B.
Department of Commerce and Management Science, R. B. Attal College, Georai, Dist. Beed (M. S.)
vanjarisb2015@gmail.com

ABSTRACT
The importance of digital literacy for the economy of every nation is emphasized by their government official around the world. The aim of digital literacy is to transform Indian economy into digital empowered society and knowledge economy. Many programs and key decisions have been taken on the digital transformation by the government at different social levels. These programmes have been implemented from 2014 to till the date continuously everywhere in India. Digital Literacy simply means that Government Services are available to society. Government of India established the management structure and monitoring bodies of the digital literacy enhancement programs which consists of Cabinet Committee on Economic Affairs (CCEA), Digital India Advisory Group (DIAG), Expenditure Finance Committee (EFC), Vittiya Saksharta Abhiyan (VISAKA) etc. Government is continuously trying to make awareness among the society about the importance and advantages of digital literacy and e-governance. Digital literacy is one of the important emerging issues before the government to strengthening the e-governance in India. This paper constructed to highlight the challenges before digital literacy and find out the opportunities to improve the steps toward digital literacy.

Keywords: *Digital Literacy, E-governance, Cash Less, IT, etc.*

INTRODUCTION

Digital Literacy is the combination of two worlds, Digital is the symbolic representation of data and literacy refers to the ability to read for knowledge write coherently and think critically about the written world. Today digital literacy is an important topic because technology is changing faster than the change of society. Digital Literacy is simply defined as the skill, knowledge, awareness and understanding of information technology to use the government services provided by the government. It is nothing but skill used in broad range of digital devices like smart-phones, tablets, laptops, desktops and all other related electronic devices to use the services. Digital literacy allows to people to interact and communicate with the world around them. This paper is highlighting on the different challenges towards the universal implementation of digital literacy in the country and also focusing on the opportunities of digital literacy in the social development.

OBJECTIVE

To overview of Digital Literacy in the Society.

To study of the challenges before Digital Literacy.

RESEARCH METHODOLOGY

This Research Paper is constructed on the basis of primarily data which is collected from the Pilot survey of 100 peoples from the general family members of Aurangabad city using deliberate sample method and Secondary data from various sources which include different articles, Journals, Article, Magazines, Periodicals, Research Works, News Papers, web sites of government of India for digital literacy and all the research related Web sites.

HYPOTHESIS

There is no association with the education and implementation of digital literacy in the society.

Challenges before Digital Literacy

Digital Literacy is successful in many countries but in India it is still going from the developing phase due to literacy ratio in rural and urban areas, lack of technological infrastructure and lack of awareness of digital advantages in the society. India is a one of the big developing nation which includes 29 economically, geographically, socially different states has different challenges for every segment of the economy of the nation. If Digital Literacy will have to be progressive and satisfactory following are the challenges before this segment.

Governance of Government

Introduction of new policies by the government and implementation procedure are being vary state wise it is a big challenge in the country. Many times it is found that different state have different political power that also impact on the implementation of digital literacy policies framed by government. Opposition of the political parties is adversely affects on the progress of the performance of Digital Literacy. There is a need of proper management structure which would be established the monitoring and implementation of all policies towards the society. Government need to improve the services available in real time from online and mobile platform,

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making financial transaction above a threshold, electronic and cashless, leveraging GIS for decision support system.

Infrastructure and Infrastructural Issues
High speed internet facility shall be made available in all local area of grampanchayat in the nation. Mobile phone and bank account of every people shall enable participation in digital and financial space at individual level. Easy availability of service centre to common people at everywhere. Need to strengthen the safe and secure cyber space in the country. Shareable private space on public cloud these are the different information technological issues before the digital literacy.

Digital Empowerment of Society
Digital literacy are require certain skill that individual need to literate in technology. technologies is also important in every sector but in India there is lack of technological use among urban and less educated people that also affect on the performance of the Digital Literacy. Government is also requiring planning to adopt new technology to universal digital literacy in India. Digital services shall make available in Indian languages.

Impracticability
Implementation of digital literacy by the government is not successful due to different socio economical variation. There is less practical implementation found among the society to make an awareness and training to every individual. Digital Literacy is found good in some states of the India like Andhra Pradesh, Kerala, Maharashtra etc. But many states are not practically implementing and generally capable individual are also not taking initiatives among such activity.

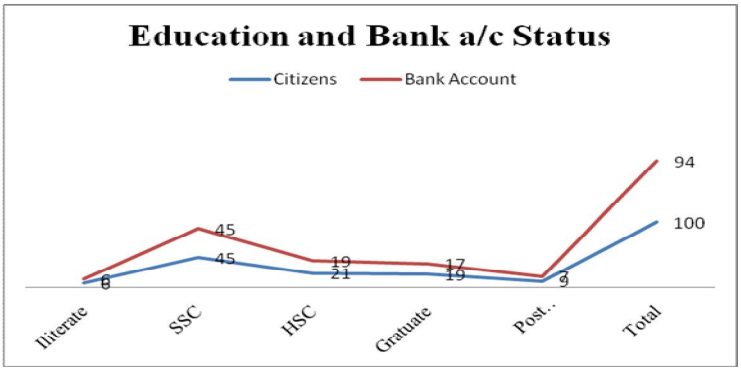
Financial Facility
Many times it is found that lack of financial requirement for specific activity are not complete at proper time due to that some activities has been went in to deficit. Availability of funds for the require activity at the proper time is very important thing and it is a big challenge in the success of every action willing to be implemented by the administration. Huge financial support is important to establish the require IT infrastructure to achieve the success of digital literacy in country and it is one of the biggest challenge before the government.

Individual Skill, Knowledge and Awareness
Use of digital devices by individual requires specific skill and knowledge. It is very important because individual knowledge and skill boost the confidence towards the digital transaction. Awareness among the individual about the advantages of the digital devices and easy, safe and secure use of services make an impact on the confidence of individual.

Lack of trained Person
Literacy rate in rural area is only 68.9% and many times it is found that people who are not or less using digital services those are illiterate or less literate. It is also seen that people who are good educated they are not interested to use 100% digital services therefore not proper trained peoples are working in the digital service sector that also affect on the performance of the Digital Literacy in India.

Following are the some facts and issues stated on the basis of the collected data analysis.

Account with the nationalize bank
Banking is the main source to the government to implement the policies and different schemes to the society. In concern of india the population and literacy ratio is still have a scope of improvement. Still government is not to achieve the 100 per cent connectivity of all individual through bank.



From the above table shows that the out of 100 respondents with different educational background 94 respondent has nationalize account. And remaining respondents does not have the bank account that means still

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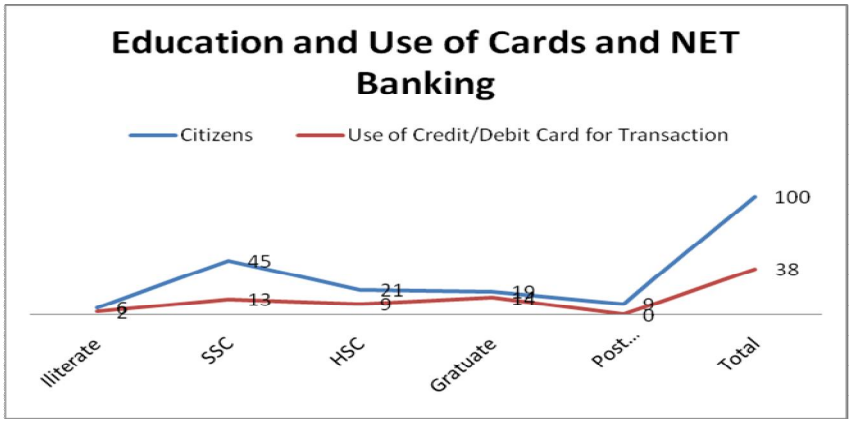
there is no 100 per cent peoples connected with the banks. It is showing that still government need to linking individual peoples with the bank account.

Use of Different Cards and NET Banking for digital transaction

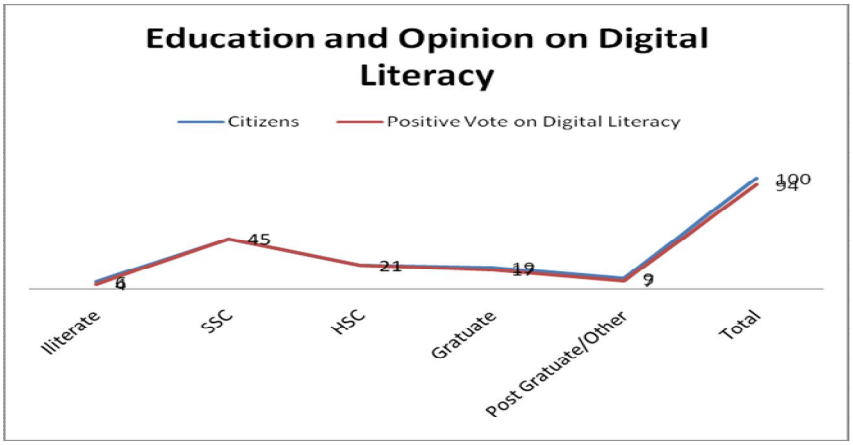
Awareness of the digital transactions is found unsatisfactory in the general society. Government is trying to transform all the cash transaction to cashless transaction even though public support for this mission is not good due to the lack of confidence to use the card transaction and awareness about the advantages of use of cash less transaction.



Above graph shows that only 38 respondents out of 100 respondents are using the net banking and card transaction instead of cash transaction. Remaing 62 per cent even they are different educational backgroud they are prefer to cash less transaction.

Opinion on Digital Literacy

Many different opinions are coming from the different section of the society obout the safe and secure money transaction which is affect on the actual market staus of the objectives of the mission of digital literacy progamme. For the purpose of acknowledge the opinion from society on digital literacy programme follwing graph analise the data.



As per the above chart 94 per cent respondents are giving positive response about the practicability of the digital literacy. Even those respondents are not using the digital source to complete their transaction but they also marked the positive opinion on the digital literacy and its practical positive impact on the different issues of economy.

Hypothesis Test

Hypothesis framed for analyze the association among education and implementation of digital literacy through different digital literacy awareness programme.

"There is no association with the education and implementation of digital literacy in the society."

Education	*Citizens*	*Bank Account*	*Use of Credit/Debit Card for Transaction*	*Positive Vote on Digital Literacy*
Illiterate	6	6	2	4
SSC	45	45	13	45

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HSC	21	19	9	21
Graduate	19	17	14	17
Post Graduate/Other	9	7	0	7
Total	100	94	38	94

Above table shows that the out of 100 respondents 94 respondents have his bank account and out of that only 38 respondents are using the different cards to the payment of transaction. Even the less use of cards and NET banking by the respondent they are confidently respond on the positive impact of the cash less transaction on the different issues of cash transaction in the society.

CONCLUSION

The digital India programme aims to transform India into a digitally empowered society and knowledge economy by leveraging IT as a growth engine of new India. India is known as a powerhouse of the software in the world even though government services to the society are still comparatively low. The national e-governance plan is approved in 2006. The digital India vision provides the intensified encouragement for future progress for this steps and this can be promote inclusive growth that covers electronic services. India in 21st Century strives to meet the aspirations of its citizens where government and its services reach the doorsteps of citizens and contribute towards a long lasting positive impact. Organization of the Digital Literacy are becomes the more important now than earlier. Therefore research scholars are require to work on this issue with major focus on interdisciplinary approach of Digital Literacy and their allied sectors.

SUGGESTION

For the achievement of successful Digital Literacy in India government require to make and set up a Strong Central and State Level Policy back up. Efforts require to Establishment of societies in the areas which offer potential for growth and establish the training program to skill development of Digital Literacy. Government requires making the separate financial provision for the Digital Literacy Programmes and their allied sector.

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WOMEN DEVELOPMENT IN INDIA THROUGH ENTREPRENEURSHIPS: OPPORTUNITIES AND CHALLENGES

Waykar V. B.
Department of Commerce, R. B. Attal College, Georai, Dist. Beed (M. S.)
vvvivekwaykar7@gmail.com

ABSTRACT
This paper attempts to analyze the status of Women Empowerment in India and highlights the opportunities and Challenges of Women's development. Today the empowerment of women has become one of the most important concerns of 21st century, because women is backbone of the society, without women development overall development of the society is impossible. But practically women empowerment is still an illusion of reality. We observe in our day to day life how women become victimized by various social evils. Women Empowerment is the vital instrument to expand women's ability to have resources and to make strategic life choices. Women form an important segment of the labour force and economic role-played by them cannot be isolated from the frame work of develop. the role of women as business owners is gradually increasing all over the world .women entrepreneurship development leads to self fulfilment and women become aware of where they are going, what their position is in the society, their status in the society, her existence and rights. Women are becoming more empowered, personally and economically, present study is initiated on empowering women through entrepreneurship development in emerging economics in India.

Keywords: *Women Empowerment, Entrepreneurs, Obstacles, opportunities, Socio-eco.Development*

INTRODUCTION
Woman constitutes the family, which leads to society and Nation. Social and economic development of women is necessary for overall socio-economic development of any society or a country. Entrepreneurship is the state of mind which many women have in her but has not been capitalized in India in way in which it should be. Role of women is necessary for in the current century for achieving the aim of overall development. Due to change in environment, now people are more capable and comfortable to accept leading role of women in our society, though there are some exceptions. Developing and developed nations have realized that developing women entrepreneurship is indispensable to flourish, as economically dominant nations in the modern high-tech world. In Indian environment men are always considered as economic supporter for his family as well as for the nation and women are considered as a care taker of the family rather than an economic support. This paper glides from the period of fifties to the 21st centuries and how transformation has occurred in the women roles.

Women's Empowerment has been an issue of immense discussions and contemplation over the last few decades world-wide. This as an agenda has been on top of the lists of most government plans & programs as well. However, it has been observed that most of the policies and programs view empowerment in the economic sense only working in the belief that economic self-reliance empowers women ignoring other variables like health, education, literacy etc. The study is based on purely from secondary sources. The study reveals that women of India are relatively disempowered and they enjoy somewhat lower status than that of men in spite of many efforts undertaken by Government. The study concludes by an observation that access to Education, Employment and Change in Social Structure are only the enabling factors to Women Empowerment.

OBSTACLES AND ISSUES FACED BY WOMEN ENTREPRENEURS IN INDIA
In Indian context attitude towards the women are still conquered by the tough resistance from the male ego and the problem of Indian women pertains to her key responsibility towards family. From the beginning till the enterprise function, women entrepreneur comes across a series of problem. In rural areas women are considered as helper.

The main obstacles faced by women entrepreneurs are as follows

- The biggest turning point of a woman' life is her wedding. She turned into a daughter-in-law from a daughter. The priority is also changed with this.
- Cast and family dominator also hinder women entrepreneur. For this women entrepreneur cannot overcome the obstacle before them to grow and flourish. In rural areas, women face more social, religious and political obstacle.
- Though our constitution speaks of equality between male-female sexes, male patriot is still the order of the day. Male dominated society destroys a female capability ability shows much less than male.

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- In our Rural India 60% of total women are illiterate. They are far behind in the field of education. Due to lack of appropriate education, women entrepreneurs are in dark about the rapidly growing new technology, new methods of production, marketing techniques, and other governmental policy.
- Various organisation in the financial sector expand their utmost support in the form of different incentives, loans etc. Many woman entrepreneurs do not aware of all these assistance provided by the institutions. Even the financial institutes are not coming forward to give financial assistance to women borrowers and for these more chances of business failure.

CHALLENGES FACE BY WOMEN ENTREPRENEURS

Low level of vocational Education: while women are making major strides in educational attainment at primary and secondary levels, they often lack the combination of education, vocational and technical skills, and work experience needed to support the development of highly productive businesses.

- **Financial problems** - Access to finance is one of the most common challenges that entrepreneurs face and this is especially true for women who are further impeded by lack of personal identification, lack of property in their own name and the need for their husband's countersignature on many documents.
- **Family Environment**- The institutional and legal environment is critical to the growth of female-owned enterprises. Heavy household responsibilities leave a demand on women especially those in rural areas who have more children.
- **Lack of family support**: Sometimes the family may make the women feel guilty of neglecting household duties in her pursuit of business obligations. Cultural traditions may hold back a woman from venturing into her own business.
- **Low capital sources**: Most of women don't have knowledge about various capital establishing sources. Traditional sources of finance like banks are reluctant to lend to women entrepreneurs especially if they do not have any male or family backing. This is especially true of lower income females. Women do not have adequate finance or legal knowledge to start an enterprise.
- **Lack of Self confidence:** lack of role models undermines the self confidence of women entrepreneurs. The activity of selling is considered abhorrent to the female gender.

STRENGTH

- Women entrepreneur are confident, creative, innovative and are capable of achieving self economic independence individually or jointly.
- They can generate employment opportunities for others through initiating, establishing and running the enterprise by keeping pace with her personal, family and social life.
- Women prefer to work from their own residence, difficulty in getting suitable jobs and desire for social recognition motivates them self–employ men.

WEAKNESSES

- Absence of proper support, cooperation and back-up for women by their own family members and the outside world people force them to drop the idea of excelling in the enterprise field.
- Women's family obligations also bar them from becoming successful entrepreneurs in both developed and developing nations.
- Female folk lacks achievement motivation as compared to male members
- The greatest obstacle for women entrepreneurs is that they are women.

OPPORTUNITY

- Women inculcate entrepreneurial values and involve greatly in business dealings.
- Business opportunities that are approaching for women entrepreneurs are eco friendly technology, Biotechnology, IT enabled enterprises, event management, tourist industry, Telecommunication, Plastic materials, Mineral water, Herbal & health care, Food, fruits and vegetables processing.
- Women entrepreneurs avail new opportunities in the rural areas.

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OBJECTIVE OF THE STUDY

1. To know the need of women Development in India.
2. Opportunities for women Entrepreneurs.
3. To Study the impact of Entrepreneurship, Development in Women Development.
4. To understand the concept and philosophy of Indian women development.
5. To find out the various personal and financial problems of women development.

RESEARCH METHODOLOGY

This study is an observatory study based on secondary data. The data has been collected from various published sources, books and websites.

DATA COLLECTION

This research is based only secondary data sources:

These all official record proved to be useful to make the study realistic and meaningful reference books, magazines, related websites, government report, library books and internet use proved help for secondary data.

The Secondary data was collected through reputed Journals, Newspapers, Books, and Websites, referred books, will be reports, and conference papers, referred journals, magazines periodicals, ministry of finance (Economic Survey) Govt.

CONCLUSION

Since the 21st century, the role of Indian women has been changing because of growing industrialization and urbanization. Indian women are becoming a effective role in the society. Over a period of time, more and more women are going for advanced, professional and technical education. Their proportion in the total workforce is also increasing. However, for women there are several handicaps to enter into and manage business. All entrepreneurs face certain challenges, but women often have additional challenges and bottlenecks because of their gender. Their male peers have lesser probability to encounter these problems. Working mothers experience even more demands regarding time, resources and energy. But it does not mean men are more successful than women. The increasing rate of success of women entrepreneurs reveals that they are imaginative, and able to achieve, in spite of the odds. Women often have such skills and innate capabilities that are advantageous in businesses. Women are likely to be great networkers, have inherent competencies for bargaining, and the capability to multi-task. By creating a strong business network, learning new tactics to maintain balance between work and life, getting inspiration from other successful women entrepreneurs, and, by keeping them updated, women entrepreneurs can attain new heights of success.

MAJOR SUGGESTION FOR THE DEVELOPMENT OF WOMEN

Right efforts are required in the improvement of women entrepreneurs and their greater contribution in the entrepreneurial activities. Women entrepreneurs need to be given assurance, freedom, and mobility to come out of their absurdities.

The following actions are recommended to authorize the women to grab different opportunities and face challenges in their business.

1. Awareness program must be conducted on a huge scale for increasing awareness among women,
2. There must be a constant attempt to inspire, motivate women entrepreneurs,
3. By arranging unlimited vocational training to women community to understand them the production process and production management,
4. Proper training programs must be organized to develop professional competencies in managerial, leadership, financial, production process, profit planning, marketing, maintaining books of accounts and other skills. These all will encourage women to start business,
5. Educational institution should tie up with various government and Non-government agencies to support in entrepreneurship development
6. Various schemes plans must be provided by the government to develop entrepreneurs in the state. E.g. the Prime ministers Rozgar Yojana, Community Development Programme (CDP), Scheme of Discriminatory Interest Rate, Rural village industries scheme etc,

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7. The financial institutions should lend their hand to provide more working capital assistance both for small scale venture and large scale ventures,
8. NGOs and government organizations must spread information about policies, plans and strategies on the improvement of women in the field of industry, trade and commerce. Women entrepreneurs should employ the various schemes provided by the Government,
9. Workshops and seminars should be organized frequently for women entrepreneurs to make their relations more cordial.
10. Government should recognize the successful or growing women entrepreneurs and award them. This recognition and publicity will motivate other women entrepreneurs. And last but not the list a good support from their family can encourage women in entering business. It's difficult for a woman to start and run a business in India as there are lots of obstacles.

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SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ANALYSIS OF VARIOUS SUBSTITUTED 2-(5-(3-(5-BROMOTHIOPHEN-2-YL)-1-(4-FLUOROPHENYL)-1*H*-PYRAZOL-4-YL)-4,5-DIHYDRO-1*H*-PYRAZOL-3-YL)PHENOL

Shirsat A. J., Rupnar B. D., Bhagat S. S. and Kakade G. K.[1]
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Chemistry, Arts, Commerce & Science College, Kille, Dharur, Dist. Beed (M. S.)
shirsatamol222@gmail.com

ABSTRACT
A series of substituted pyrazolines synthesis, used procedure was a simple, efficient and green. The reaction between acrolein, and α, β- enone in presence of phenylhydrazine yield simple pyrazoline via. Cyclization. The easy work-up of product under mild condition with fast reaction this significant feature of synthesis of pyrazolines. Further the structures of pyrazoline derivatives were elucidated by IR, ^{1}H NMR and mass spectral analysis. The compounds were evaluated for their antibacterial activity using Gram + positive and Gram - negative bacteria.

Keywords: *Pyrazolines, chalcones, synthesis, spectral data, antibacterial activity.*

INTRODUCTION

Many heterocyclic compounds due to their definite activity are employed in the treatment of several infectious diseases. Their use in the treatment is attributed to their intrinsic toxicity to different pathogens. Among a broad range of heterocyclic compounds that have been explored for the development of pharmaceutically significant molecules, pyrazolines constitute an interesting class of heterocycles due to their synthetic versatility and large variety of biological activities like acyl-CoA inhibitory [1], antioxidant[2], anticancer[3], antifungal[4], antibacterial[5], antidepressant[6-8], anticonvulsant[9], antiinflammatory[10], antitumor[11], analgesic[12], neuroprotective [13] properties.

EXPERIMENTAL

For the synthesis of the compounds, all required chemicals were obtained from SD Fine chemicals and Sigma Aldrich. Melting points are uncorrected and were recorded in open capillaries. By using Bruker Avance II 400 MHz NMR Spectrophotometer, solvent is DMSO-d6 and TMS as an internal standard, 1H NMR spectra were recorded. On FT-IR Spectrophotometer Model RZX (Perkin Elmer) on potassium bromide disk, the infra-red spectra were recorded. By using electro-spray method (ES), Mass spectra were recorded on Macromass mass spectrophotometer (Waters). Synthesized compounds purity was checked on TLC plate which is coated by silica gel as stationary phase which is obtained from Merck. In this, mobile phase is solvent mixture of hexane / ethyl acetate (80:20).

GENERAL PROCEDURE

Compound **1c** Chalcone (0.01mol) was dissolved in 20ml ethanol. To this reacting mixture, 0.02 mol of hydrazine hydrate was slowly added. These contents were heated for 4 hr. under mild reflux and then in to the reaction mixture, glacial acetic acid (4-5 drops) was added and heating was continued to 3hr and then cooled up to room temperature. Cold water (60ml) was slowly added to the flask and product was separated. This product was filtered, washed with cold water for many times and recrystallized in ethanol. The compounds **2(a-g)** were prepared by following above general procedure. Physical data of synthesized compounds are recorded in **Table 1**. Confirmed synthesized compounds structures by ^{1}HNMR, Mass and IR spectra.

IR (2c) (cm^{-1}):965(C-Cl), 1070(Ar-Br), 1555(C=C), 1598(C=N), 3121(O-H), 3310(N-H).

^{1}H NMR (2c) (DMSO-d_6)δ ppm: 3.1124-3.1665(dd, 1H, -CH_a-, *J*=12.08 Hz & *J*=9.56Hz),

3.5231-3.5713(dd,1H,-CH_b-, *J*= 12.12Hz & *J*=7.16Hz), 4.7452-4.7901(ddd,1H, -CH_c-, *J*=6.24Hz, *J*=7.12Hz & *J*=5.36Hz), 6.9190-6.9341(d, 1H, -NH-, *J*=6.04Hz), 7.3218-7.4123(m, 2H, Ar-H), 7.4352-7.5424(m, 1H, Ar-H), 7.6389-7.7093(m, 2H, Ar-H), 7.8326(s, 1H, Ar-H), 7.8587-7.8998(m, 1H, Ar-H), 7.9362(s,1H, Ar-H), 7.9842(s, 1H, Ar-H), 8.5863(s,1H, pyrazole-H), 11.3586(s, 1H, Ar–OH).

ES-MS (2c) (m/z):517.2(M+1), 518.2(M+2), 519.2(M+3), 521.2(M+5).

IR (2f) (cm^{-1}): 955(C-Cl), 1065(Ar-Br), 1575(C=C), 1600(C=N), 3231(O-H), 3342(N-H).

^{1}H NMR (2f) (DMSO-d_6)δ ppm: 2.4123(s, 3H, -CH_3), 3.1293-3.1785(dd, 1H, -CH_a-, *J*=10.58 Hz & *J*=9.10Hz), 3.4819-3.5211(dd,1H,-CH_b-, *J*= 8.50Hz & *J*=7.18Hz), 4.7251-4.7552(ddd,1H, -CH_c-, *J*=4.12Hz, *J*=3.92Hz & *J*=4.00Hz), 6.8970-6.9202(d, 1H, -NH-, *J*=9.2Hz), 7.1987-7.2835(m, 2H, Ar-H), 7.4567-7.5364(m, 1H, Ar-H),

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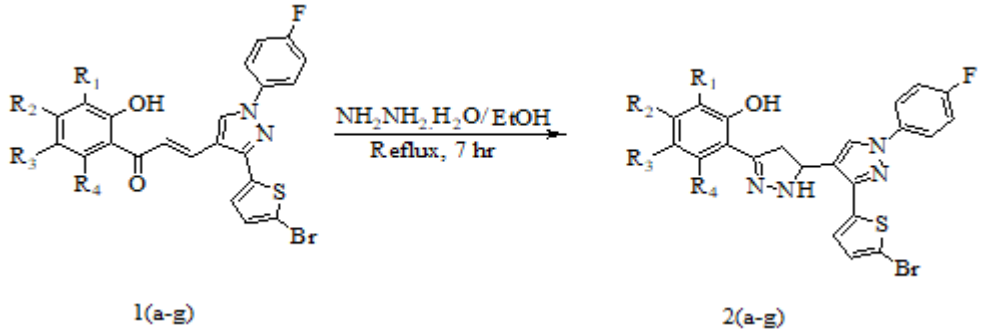
7.5825-7.5998(d, 1H, *J*=6.92 Hz), 7.8254(s, 1H, Ar-H), 7.8325-7.8496(d, 1H, Ar-H, *J*=6.84Hz), 7.8751(s,1H, Ar-H), 7.9053(s, 1H, Ar-H), 8.6587(s,1H, pyrazole-H), 11.8521(s, 1H, Ar–OH).

ES-MS (2f) (m/z): 531.1(M+1), 532.1(M+2), 533.1M+3), 535.1(M+5).



Scheme-1: Synthesis of various 2-(5-(3-(5-bromothiophen-2-yl)-1-(4-fluorophenyl)-1*H*-pyrazol-4-yl)-4,5-dihydro-1*H*-pyrazol-3-yl)phenol

Table-1: Physical data of compounds (2a-g)

Comp.	R_1	R_2	R_3	M.P. (^oC)	Yield (%)
2a	H	H	H	162-164	69
2b	H	H	CH_3	182-184	72
2c	H	H	Cl	190-192	74
2d	Cl	H	Cl	180-182	77
2e	H	H	F	212-214	69
2f	H	CH_3	Cl	168-170	81
2g	H	H	Br	206-208	78

RESULT AND DISCUSSION

The synthetic work was carried out beginning from chalcones with hydrazine hydrate in ethanol by cyclization pyrazolines are formed successfully in moderate to good yields. All newly synthesized compounds were identified on the basis of ^{1}H NMR, melting point range, Mass spectral analysis & IR. Using disc diffusion method, newly synthesized derivatives were evaluated for antimicrobial activity.

Antimicrobial activity: Compounds 2(a-g) were analyzed for their in vitro antimicrobial activity against *Escherichia coli (ATCC 25922), Staphylococcus aureus (ATCC 25923), Pseudomonas aeruginosa (ATCC 27853)* by paper disc diffusion method and reference standard drug is Gentamycin. Antifungal activity was analyzed against Candida sp. using Nystatin as standard drug. At 100 µg/ml concentration, all the tests were evaluated. Muller Hinton agar was the culture media. The region of inhibition was measured in mm after 24 hr of incubation at 37oC. Microbial data for compounds 2(a-g) are summarized below in Table 2.

Table-2: Antimicrobial Analysis Data

Sr. No.	Comp. No.	*Escherichia coli (ATCC 25922)*	*Staphylococcus aureus (ATCC 25923)*	*Pseudomonas aeruginosa (ATCC 27853)*	*Candida sp.*
1	2a	No Zone	No Zone	No Zone	No Zone
2	2b	No Zone	No Zone	No Zone	No Zone
3	2c	No Zone	No Zone	No Zone	No Zone
4	2d	No Zone	No Zone	No Zone	No Zone
5	2e	No Zone	No Zone	No Zone	No Zone
6	2f	No Zone	No Zone	No Zone	No Zone
7	2g	No Zone	No Zone	No Zone	No Zone
8	Gentamycin	28 mm	23 mm	32 mm	--
9	Nystatin	--	--	--	23 mm

CONCLUSION

Starting from Chalcones 1(a-g), different new cyclized derivatives of pyrazoline have been synthesized to good yield and characterized by IR, ^{1}HNMR and Mass spectral data. The newly synthesized derivatives of pyrazolines were evaluated against Candida sp. and Gram positive as well as Gram negative bacterial strains.

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STUDIES ON PHYSICO-CHEMICAL PARAMETERS OF WATER AND ZOOPLANKTON DIVERSITY OF GODAVARI RIVER AT GOLEGAON, JALNA DISTRICT, MAHARASHTRA

Nimbalkar R. K. and Pawar D. A.[1]
Department of Zoology, R. B. Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Zoology, Deogiri College, Aurangabad (M. S.)

ABSTRACT
The major role of zooplankton in an aquatic ecosystem is of energy transfer between phytoplankton and fishes. The present study deals with the physico- chemical parameters of water and diversity of zooplankton from Godavari River at Golegaon, District Jalna. Maharashtra. Study period was one year between January 2018 and December 2018. Godavari River at Golegaon provides fish food for humans mainly of Labeo rohita, Cirrahuns mirigala, Catla catla etc. Total 40 species of zooplankton were collected of which rotifera 14 species; cladocera 10 species, copepoda 11 species and ostracoda 5 species were observed during study period of one year. The rotifera was dominated followed by copepoda, cladocera and ostracoda from the study area in one year. Throughout study duration of one year on monthly basis physico- chemical parameters such as water temperature, pH, Salinity, Dissolved Oxygen, TDS, Conductivity, Turbidity, Free CO_2 concentration and BOD were analysed. The diversity indices of zooplanktons in relation to physico- chemical parameters also calculated.

Keywords: *Zooplankton, Diversity, Godavari River, Golegaon, Purushottampuri*

INTRODUCTION
In an aquatic ecosystem such as pond two types of producers macrophytes which are rooted or large floating plants and phytoplankton those are minute floating plants generally algae or green bacteria as distributed throughout the pond as deep as light penetrates. Water in a greenish colour observed when phytoplanktons are abundant in number. Two types of microconsumers, zooplankton and benthos (bottom forms) appears in the aquatic ecosystem, their main role is transfer of energy from lower trophic level to higher trophic level in a food chain.

Three groups of freshwater habitats can be considered as standing water or lentic ecosystems which include lakes and ponds, running water or lotic ecosystems which include streams, rivers and springs and third group of freshwater habitats is wetlands, where water levels are not same seasonally and annually or water level fluctuate up and down. Examples of wetlands are marshes and swamps. Small portion of the Earth surface is occupied by freshwater habitats compared to terrestrial and marine habitat, but freshwater habitats are more important to humans than their relative area **[1].**

The Godavari river is the largest river in India after the Ganga river, it originates in the Triambakeshwar, Maharashtra and flows east about 1465 Km draining the states of Maharashtra, Telangana, Andhra Pradesh, Chhaattisgarh, Madhya Pradesh, Odisha, Karnataka, Puducherry and emptying into Bay of Bengal. The physico- chemical parameters of water are mainly responsible for the distribution and diversity of zooplankton species in an aquatic ecosystem **[2].** In an aquatic food web between autotrophs and heterotrophs zooplanktons creates a main link in the transfer of energy at secondary level **[3].**

The physico- chemical parameters of water and interactions among them are very important to study the growth, reproduction, distribution, composition and diversity of aquatic organisms **[4, 5].** The basic physico- chemical parameters affecting the aquatic environments are pH, dissolved oxygen, temperature, conductivity of water and nutrients **[6].** The highest rate of organic matter decomposition which increases the higher BODs values in an ecosystem **[7].** Communities of zooplankton have been documented by the studies of **[8]** from some fresh water bodies in Kolhapur District related to pollution. Researchers documented the zooplankton community and physico- chemical parameters of Kham River, Aurangabad **[17],** Ambe Ghosale Lake of Thane city **[18]** and Narangi Sarangi dam of Vaijapur District Aurangabad of Maharashtra **[19].**

The aim of the present investigation was to study the physico- chemical parameters of the water along with zooplankton diversity and diversity indices of the zooplanktons of the Godavari River at Golegaon, District Jalna. Maharashtra.

MATERIALS AND METHODS
Study Area
Two sampling stations were selected of Godavari River to study the physico- chemical parameters of water and diversity of zooplanktons. Out of two sampling stations one is situated in Partur taluka and one is in Majalgaon

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taluka. Station I is situated near Golegaon village of Partur taluka in Jalna District. Golegaon is 80 Km towards South from District headquarters Jalna. Station I is located at a height of 462 meters above M.S.L.

Station II is situated near Purushottampuri village in Majalgaon taluka in Beed District. Station II is located at a height of 407 meters above M.S.L. Purushottampuri is 62 Km East from District headquarters Beed. Temple named by god Purushottam is very famous in Purushottampuri and is the only temple in India mostly Hindu families visited this place in Marathi month aadhik mass to take a darshan of god Purushottam.

Collection, Preservation and Identification

On a monthly basis from two sampling stations water samples were collected for the study of physico-chemical parameters and zooplankton community for a period of one year from January 2018 to December 2018. Plankton net having 60 micro meters mesh size was used for collection of planktons. Every time through the plankton net 100 litres of water was sieved. The plastic containers of 1-L capacity were used for collections, before use of the plastic containers these were rinsed with sampling water. Filled plastic containers were sealed and transported to laboratory for analysis of physico- chemical parameters.

All the times water samples were collected from same location and in morning between 7.00 am to 10.00 am. Collected samples were preserved in 4% formalin and stained with Bengal Rose. The standard protocols of **[9, 10]** were used for the analysis of physico-chemical parameters of the water samples. TDS meter is used to record the TDS of water on the spot. pH, temperature, Dissolved Oxygen and Electrical Conductance were analysed and recorded on the spot immediately after collection of water samples by using multi 340i /set water analysis kit.

Under the microscope freshwater zooplankton species were studied and standard protocols of **[11, 12]** were used for the identification of zooplanktons. Drop method was used to count the planktons. Plankton counting chamber was used for quantitative analysis and Stereomicroscope for observations. Wide mouthed pipette was used to take 1 ml of sample in counting cell and allowed to settle about 4- 5 minutes and after the counting was done. Four counting's was done for each sample of the plankton and average was calculated from it. Total planktons present in one litre of water sample were estimated by **[13, 14].**

Statistical Analysis and Diversity Indices

Different diversity indices such as Dominance_D, Simpson_1-D, Shannon-H, Evenness and Margalef were calculated by software PAST, v 3.0.

RESULTS AND DISCUSSION

Physico- Chemical Parameters

In present study on monthly basis water samples were collected and analysed for physico- chemical parameters of water collected from two sampling stations of Godavari River between January 2018 and December 2018. All the physico- chemical parameters of water from sampling stations I and II are represented in Table 1 and 2 respectively.

Water temperature (^{0} C)

Water temperature 24^{0}C recorded from sampling station I was lowest in December and highest 26.5^{0}C in month of May, while water temperature from sampling station II also lowest in month of December (24.2^{0}C) and 27^{0}C was recorded in month of May.

pH

The values of pH concentration recorded from sampling station I was in the range of 7.4±0.2 and 8.4±0.2, pH 7.4 was observed minimum in month of May, while maximum pH 8.4 was recorded in month of July. pH concentration values from sampling station II was in the range of 7.7±0.2 and 8.5±0.2, low pH 7.7 in month of April and higher pH value 8.5 were recorded in September and November months.

Salinity (mg/L)

Salinity from water samples of sampling station I was recorded in the range of 0.68 mg/L and 0.862 mg/ L, salinity lowest and highest was observed in January and December months respectively, while range of salinity for sampling station II was 0.685 mg/L and 0.892 mg/L. Low salinity 0.685 mg/L in month of July and highest salinity 0.892 mg/L in month of June was recorded from sampling station II.

Dissolved Oxygen (mg/L)

The concentration of dissolved oxygen in water is depends on the physical, chemical and biochemical processes existing in aquatic systems. Minimum dissolved oxygen 6.7 mg/L and maximum value of dissolved oxygen 8.45 mg/L was recorded from sampling station I in month of March and December respectively, while

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minimum and maximum values of dissolved oxygen from sampling station II 6.5 mg/L and 11.5 mg/L was recorded in January and December months respectively.

Conductivity (µ S/cm)
The conductivity for sampling station I, 120 µ S/cm was recorded in January month, while in month of May it was 280 µ S/cm. Also, the conductivity values from sampling station II were low 124 µ S/cm in month of January and highest 270 µ S/cm in month of December.

Turbidity (NTU)
Maximum value of turbidity recorded from sampling Station II was 168 (NTU) and low value of turbidity 71 (NTU) in months of September and February respectively. Turbidity 95 (NTU) lowest and highest 158 (NTU) were recorded in months of January and July from sampling station I, respectively.

Free CO_2 (mg/L)
The free CO_2 concentration 26.2 mg/L in month of August was recorded from sampling station I and 26.4 mg/L was recorded from sampling station II. Low free CO_2 concentrations from sampling stations I and II were 11.5 mg/L and 11.6 mg/L recorded in month of March and January respectively. Our results support the statement of **[15]** that Dissolved Oxygen and Free CO_2 concentrations are reciprocal.

BOD (mg/L)
BOD range for sampling station I was 1.85 mg/L to 6.9 mg/L, while range of BOD for sampling station II 2.3mg/L to 7.68 mg/L were recorded from river water.

Diversity of Zooplanktons
During the study period of one year from January 2018 to December 2018 total 40 species of zooplankton belonging to four orders namely rotifera (14 species), cladocera (10 species), copepoda (11 species) and ostracoda (5 species) were listed in Table 3.

Rotifera
In the study period of one year from January 2018 to December 2018, total 14 species of rotifera belonging to 7 genera were collected and are listed in table 3. The range of population density for rotifers was 515 ind/L and 825 ind/L was recorded and shown in table 4. Minimum population density 515 ind/L and maximum population density 825 ind/L were recorded in months of December and June respectively. The species dominance was minimum (0.8662) in December month, while maximum (0.9118) was recorded in month of June. The Simpson diversity index was highest (0.1338) during December and low (0.08821) in month of June. The Shannon diversity index (H) was maximum (0.259) in December while minimum (0.1873) was recorded in June month.

The highest species evenness (0.6478) and low species evenness (0.603) was recorded in months of December and June respectively. The Margalef species richness (R1) maximum (0.1583) in month of December and minimum (0.1479) in month of June was recorded.

Cladocera
Total 10 species of cladocera belonging to 6 genera were collected in one-year study period and are listed in table 3. Population density range for cladocera was observed between 350 ind/L and 642 ind/L. Minimum and maximum population densities were recorded in months of September and June respectively, and are shown in table 4. The species dominance was minimum (0.8159) in September, while maximum (0.8896) was recorded in month of June. The minimum values of Simpson diversity index (0.1104), Shannon diversity index (0.2232), species evenness (0.6251) and Margalef species richness (0.1533) were recorded in month of June, while maximum values of Simpson diversity index (0.1841), Shannon diversity index (0.3307), species evenness (0.696) and Margalef species richness (0.1676) were recorded in month of September.

Copepoda
Totally 11 species of copepoda belonging to 9 genera were collected and are listed in table 3. Copepoda population density during study period was varies in between 490 ind/L and 905 ind/L, minimum population density 490 ind/L and maximum population density 905 ind/L was recorded in months of September and June respectively and are presented in Table 4. The species dominance was minimum (0.8604) in September, while maximum (0.9189) was recorded in month of June. The minimum values of Simpson diversity index (0.08107), Shannon diversity index (0.1753), species evenness (0.5958) and Margalef species richness (0.146) were recorded in month of June, while maximum values of Simpson diversity index (0.1396), Shannon diversity index (0.2676), species evenness (0.6534) and Margalef species richness (0.1594) were recorded in month of September.

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Ostracoda

Five species of ostracoda belonging to five different genera was collected in study period and are shown in table 3. Population density range for ostracoda varies in between 185 ind/L and 558 ind/L during study period. The minimum and maximum population densities 185 ind/L and 558 ind/L were recorded in months of October and May respectively. The species dominance was high (0.8793) during month of June, while low (0.7077) in month of October. The maximum values of Simpson diversity index (0.2923), Shannon diversity index (0.468), species evenness (0.7984) and Margalef species richness (0.1846) were found in October month, while minimum values of Simpson diversity index (0.1207), Shannon diversity index (0.2392), species evenness (0.6351) and Margalef species richness (0.1555) were observed in month of June.

In a food web of aquatic ecosystems zooplanktons infest the central or focal position and they assist expressively, the biological productivity of the freshwater ecosystem **[20].** According to **[21, 22 & 23]** the characteristics of tropical lakes and rivers are the dominant status of rotifer species in rivers in relative to cladocerans and copepods which our study confirmed with it. In the present study between January 2018 and December 2018 the pH values for sampling station I diverges from 7.4 – 8.4, while pH values of Station II vary from 7.7- 8.5 (Table 1 and 2).

Maximum metabolic activities of aquatic organisms are grounded on pH hence most aquatic organisms are tortured **[16].** Biota of an ecosystem is directly and or indirectly influenced by an extrinsic factor temperature. Diversification in temperature and photic conditions in an aquatic ecosystem vary the seasonal productivity of ecosystem. Water temperature influences metabolic and physiological activities and life processes such as movements, feeding, reproduction and aquatic organisms distribution.

In our present study minimum water temperature was recorded in winter, while maximum water temperature was found in summer season and is shown in Table 1 and 2 from sampling stations I and II respectively. The Preety indicator of overall water quality is electrical conductivity **[24]** and higher values of electrical conductivity indicates the pollution level of the lakes **[25].** In our study, minimum electrical conductivity from both sampling stations was recorded in January month, but maximum electrical conductivities were recorded in months of May and December from sampling stations I and II respectively. The plankton population of freshwater species is controlled by the major factor salinity **[26].** The total dissolved solids minimum values were recorded in November while maximum value for station I and II were recorded in months of June and January respectively in our study. Higher dissolved oxygen concentration is the indicator of healthy water body and DO is influential parameter in water quality valuation **[27, 28].** Our study shows that water from both sampling stations contains higher concentration of dissolved oxygen and is adequate to sustain aquatic life form.

CONCLUSION

The present investigation study from Godavari River reveals that Seasonal variation in zooplankton diversity and its distribution is depends on the physico- chemical parameters of the water. Also, the distribution of zooplankton species in freshwater is mostly depends on water temperature factor. River water pollution should be protected from human activities and sources of water pollution to maintain the healthy aquatic ecosystems which results to sustain all life forms.

Table-1: Physico- chemical parameters of Godavari River water at Golegaon Dist. Jalna (MS) India between January 2018 and December 2018.

	Months											
Parameters	January	February	March	April	May	June	July	August	September	October	November	December
Water temp (°C)	24.5	24.8	25	25.6	26.5	26	25	25	24.7	24.5	24.8	24
pH	7.5	7.8	8.1	7.9	7.4	7.6	8.4	8.15	7.85	7.9	8.2	7.6
Salinity (mg/L)	0.68	0.751	0.712	0.852	0.725	0.857	0.794	0.75	0.7	0.815	0.834	0.862
DO (mg/L)	7.3	7.6	6.7	7.5	8	6.7	8.3	7.4	8.1	7.25	6.75	8.45
TDS (mg/L)	0.73	0.846	0.759	0.645	0.683	0.88	0.598	0.71	0.685	0.723	0.617	0.826
Conductivity (µS/cm)	120	126	238	253	280	235	240	215	187	195	205	255
Turbidity (NTU)	95	93	90	105	124	135	158	155	140	145	140	148
Free CO2 (mg/L)	12.3	12.8	11.5	15.5	18.6	19.8	24.7	26.2	24.5	22.1	22.6	23.7
BOD (mg/L)	1.85	2.35	4.2	3.54	6.48	2.85	3.57	4.87	6.65	5.93	5.87	6.9

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Table-2: Physico- chemical Parameters of Godavari River water at Purushottampuri Dist. Beed (MS) India between January 2018 and December 2018.

	Months											
Parameters	January	February	March	April	May	June	July	August	September	October	November	December
Water temp (°C)	24	24.5	25.4	26	27	26.8	26	25.4	25.1	25	24.5	24.2
pH	8.21	7.95	8.34	7.7	7.94	8.25	8.25	7.85	8.5	8.12	8.5	7.8
Salinity (mg/L)	0.75	0.821	0.756	0.875	0.764	0.892	0.685	0.84	0.87	0.73	0.816	0.743
DO (mg/L)	6.5	6.7	8.92	6.57	9.35	9.27	10.5	9.75	8.95	10.5	10.87	11.5
TDS (mg/L)	0.952	0.845	0.658	0.845	0.76	0.8	0.84	0.68	0.86	0.82	0.585	0.654
Conductivity (µS/cm)	124	136	154	146	242	225	260	245	185	176	214	270
Turbidity (NTU)	84	71	87	110	120	147	140	160	168	158	160	155
Free CO2 (mg/L)	11.6	13.8	15.1	14.8	17.5	16.4	20.6	24.2	23.8	26.4	25.4	24.5
BOD (mg/L)	2.3	3.25	3.64	4.85	7.5	3.63	4.24	5.69	7.68	6.64	5.92	5.5

Table-3: Zooplankton species collected from Godavari River at Golegaon Dist. Jalna and Purushottampuri Dist. Beed (MS) India from January to December 2018.

Sr. No	Taxonomic group / Genus	Zooplankton species
I	**Rotifera**	
A	*Asplanchna* Gosse, 1850	
1		*Asplanchna intermedia* Hudson, 1886
B	*Anuraeopsis* Lauterborn, 1900	
2		*Anuraeopsis fissa* Gosse, 1851
3		*Anuraeopsis navicula* Rousselet, 1892
C	*Filinia*Vincent, 1824	
4		*Filinia longiseta* Ehrenberg,1834
D	*Keratella* Vincent, 1822	
5		*Keratella tropica* Apstein, 1907
E	*Branchionus* Pallas, 1776	
6		*Branchionus rubens* Ehrenberg, 1838
7		*Branchionus falcatus* Zacharias, 1898
8		*Branchionus calyciflorus* Pallas, 1776
9		*Branchionus quadridentatus* Hermann, 1783
10		*Branchionus bidentata* Anderson, 1889
11		*Branchionus diversicornis* Daday, 1883
12		*Branchionus budapestinesis* Daday, 1885
F	*Lecane* Nitzsch, 1827	
13		*Lecane papuana* Murray, 1913
G	*Notholca* Gossse, 1886	
14		*Notholca lebis* Gosse, 1887
II	**Cladocera**	
A	*Daphnia* Muller, 1785	
15		*Daphnia carinata* King, 1853
16		*Daphnia magna* Straus, 1820
B	*Moina* Baird, 1850	
17		*Moina flagellate* Hudendroff, 1876
18		*Moina macrocopa* Straus, 1820
19		*Moina brachiata* Jurine, 1820
C	*Ceriodaphnia* Danna, 1853	
20		*Ceriodaphnia reticulata* Jurine, 1820
D	*Diaphanasoma* Fischer, 1850	
21		*Diaphanasoma sarsi* Richard, 1895
22		*Diaphanasoma excisum* Sars, *1885*
E	*Moinodaphnia* Herrick, 1887	
23		*Moinodaphnia macleayi* King, 1853
F	*Leydigo* Fischer, 1854	
24		*Leydigo acanthocercoids*Fischer, 1854

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III	**Copepoda**	
A	*Eucyclops* Claus, 1893	
25		*Eucyclops speratus* Lilljeborg, 1901
B	*Mesocyclops* Claus, 1893	
26		*Mesocyclops hyalinus* Rehberg, 1880
27		*Mesocyclops aspericornis* Daday, 1906
C	*Sinediaptomus* Kiefer, 1937	
28		*Sinediaptomus indicus* Sewell, 1934
D	*Heliodiaptomus* Kiefer, 1932	
29		*Heliodiaptomus viduus* Gurney, 1916
E	*Thermocyclops* Kiefer, 1927	
30		*Thermocyclops hyalinus* Rehberg, 1880
F	*Neodiaptomus* Kiefer, 1932	
31		*Neodiaptomus lindbergi* Brehm, 1951
32		*Neodiaptomus schmakeri* Poppe & Richard, 1892
G	*Apocyclops* Lindberg, 1942	
33		*Apocyclops dengizicus* Lepeschkin, 1900
H	*Paracyclop* Fischer, 1853	
34		*Paracyclop fermbrialis* Fischer, 1853
I	*Cletocamptus* Schmankevitch, 1875	
35		*Cletocamptus albuquerquensis* Herrick, 1895
IV	**Ostracoda**	
A	*Cypris*Muller, 1776	
36		*Cypris protubera* Muller, 1776
B	*Cypretta* Vavra, 1895	
37		*Cypretta fontinalis*
C	*Hemicypris* Sars, 1903	
38		*Hemicypris anomala* Furtos, 1993
D	*Heterocypris* Claus, 1892	
39		*Heterocypris dentatomarginatus* Baird, 1859
E	*Cyprinous* Brady, 1886	
40		*Cyprinotus nudus* Brady, 1885

Table-4: Diversity indices of zooplankton from Godavari River at Golegaon Dist. Jalna and at. Purushottampuri Dist. Beed (MS) India from January to December 2018.

	January	February	March	April	May	June	July	August	September	October	November	December
Rotifera												
Individuals	680	665	756	689	705	825	694	724	585	678	560	515
Dominance_D	0.8951	0.893	0.9045	0.8963	0.8984	0.9118	0.8969	0.9008	0.8802	0.8948	0.8756	0.8662
Simpson_1-D	0.1049	0.107	0.09545	0.1037	0.1016	0.08821	0.1031	0.09923	0.1198	0.1052	0.1244	0.1338
Shannon_H	0.2146	0.2179	0.1993	0.2126	0.2092	0.1873	0.2115	0.2054	0.2378	0.215	0.2449	0.259
Evenness_e^H/S	0.6197	0.6217	0.6102	0.6185	0.6164	0.603	0.6178	0.614	0.6342	0.6199	0.6388	0.6478
Margalef	0.152	0.1525	0.1497	0.1517	0.1512	0.1479	0.1515	0.1506	0.1553	0.1521	0.1563	0.1583
Cladocera												
Individuals	545	574	635	624	568	642	490	485	350	389	450	557
Dominance_D	0.8726	0.8782	0.8885	0.8868	0.8771	0.8896	0.8604	0.8592	0.8159	0.8309	0.8501	0.875
Simpson_1-D	0.1274	0.1218	0.1115	0.1132	0.1229	0.1104	0.1396	0.1408	0.1841	0.1691	0.1499	0.125
Shannon_H	0.2494	0.2409	0.2249	0.2276	0.2426	0.2232	0.2676	0.2694	0.3307	0.31	0.2827	0.2458
Evenness_e^H/S	0.6416	0.6362	0.6261	0.6278	0.6373	0.6251	0.6534	0.6546	0.696	0.6817	0.6634	0.6393
Margalef	0.1569	0.1558	0.1535	0.1539	0.156	0.1533	0.1594	0.1597	0.1676	0.165	0.1614	0.1564
Copepoda												
Individuals	675	746	840	814	790	905	684	653	490	586	671	726
Dominance_D	0.8944	0.9034	0.9132	0.9107	0.9083	0.9189	0.8956	0.8912	0.8604	0.8804	0.8938	0.901
Simpson_1-D	0.1056	0.0966	0.08678	0.08929	0.09174	0.08107	0.1044	0.1088	0.1396	0.1196	0.1062	0.09898
Shannon_H	0.2157	0.2011	0.1849	0.1891	0.1932	0.1753	0.2137	0.2206	0.2676	0.2376	0.2165	0.205
Evenness_e^H/S	0.6203	0.6114	0.6016	0.6041	0.6065	0.5958	0.6191	0.6234	0.6534	0.6341	0.6209	0.6138
Margalef	0.1522	0.15	0.1475	0.1481	0.1488	0.146	0.1519	0.1529	0.1594	0.1553	0.1523	0.1506
Ostracoda												
Individuals	235	341	426	457	558	580	419	476	452	185	345	395
Dominance_D	0.7514	0.8121	0.8431	0.852	0.8752	0.8793	0.8409	0.857	0.8506	0.7077	0.8138	0.833
Simpson_1-D	0.2486	0.1879	0.1569	0.148	0.1248	0.1207	0.1591	0.143	0.1494	0.2923	0.1862	0.167
Shannon_H	0.4147	0.3359	0.2928	0.2799	0.2455	0.2392	0.2959	0.2727	0.2819	0.468	0.3336	0.307
Evenness_e^H/S	0.757	0.6996	0.6701	0.6615	0.6391	0.6351	0.6722	0.6567	0.6628	0.7984	0.698	0.6797
Margalef	0.178	0.1683	0.1628	0.1611	0.1564	0.1555	0.1632	0.1601	0.1613	0.1846	0.168	0.1646

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STUDY OF REFLECTION COEFFICIENT OF SOME CHEMICAL FOOD PRESERVATIVES

Badhe S. G.
Department of Physics, R. B. Attal College, Georai, Dist. Beed (M. S.)
sgbadhe3@gmail.com

ABSTRACT
A Preservative is a substance or a chemical that is added to food products to prevent decomposition by microbial growth or by undesirable chemical changes. These molecular changes affect the quality of the food. Impedance spectroscopy technique is an important technique to study these molecular changes. In the present work Reflection coefficient (ρ) of food Preservative Citric Acid is studied. A low frequency Time Domain Reflectometry (TDR) technique is developed in the laboratory and used for the study. Various aqueous solutions of different concentration (0.005-0.1) are prepared with freshly collected distilled water and studied at four different temperatures (25°C, 35°C, 45°C and 55°C). Real (ρ') and Imaginary (ρ'') part of the solutions is studied. It was observed that Reflection Coefficient changes as the concentration and temperature changes. Details are discussed in the text.

Keywords: *Impedance, Reflection Coefficient, Food Preservative, Citric Acid, TDR Technique.*

INTRODUCTION
Food preservatives play an important role in preserved and packed food to maintain quality of food. It is important and interesting to estimate electrical properties of food preservatives. The water is the major constituent of liquid food; we have undertaken the study electrical properties of preservatives in aqueous solution. A Citric Acid chemical food preservative is selected for the study.

Citric Acid (chemical formula $C_6H_8O_7$) is a weak organic acid besides this it is one of the strongest edible acids. It is used as a flavoring and preservative in food and beverages, especially soft drinks and candies [1]. It is denoted by E number **E330.** Citric acid has 247 kcal per 100 g [2].

Exposure to pure citric acid may cause cough, shortness of breath, or sore throat. Over-ingestion may cause abdominal pain and sore throat. Exposure of concentrated solutions to skin and eyes can cause redness and pain [3]. Long-term or repeated consumption may cause erosion of tooth enamel [4, 5].

Spoilage of the food can be detected by measuring molecular change in food stuff. TDR is widely used technique to study the molecular changes of the variety substances. Several researchers used this technique to the study the pathogens or bacteria of the food products [6-9]. Researchers also used 'E Nose' based on this technique to study the growth of bacteria or micro organisms before the food get spoiled [10]. A sensory evaluation technique such as descriptive analysis is used to detect the quality of milk [11, 12]. TDR technique is useful in medical field. Researcher used this for the detection of blood sugar [13].

TDR is widely used technique because it uses a small signal and applied stimulation does not alter the equilibrium conditions of the system. The signal applied to the samples makes it possible to link the properties of the liquid or solid being studied with the variations or changes obtained in its characteristic impedance. This is due to the physical structure of the material, the chemical processes occurring in it, or a combination of both. Consequently, electrochemical impedance spectroscopy is a non-destructive technique providing robust measurements [14].

A low frequency Time Domain Reflectometry (TDR) unit is developed in the laboratory [15, 16] and used for the Impedance analysis. In this technique, a step up pulse is used as an incident pulse which propagated down through the transmission line towards the sample under investigation and reflected back. It reflects the part of the input signal and some part of the input signal is absorbed in it. These signals are monitored by oscilloscope at particular point on line. The resultant signal is analyzed for determination of material properties. In the TDR measurement transmission line, sample cell or probe length plays important role. The calibration of sample cell or probe is important part of TDR measurement.

EXPERIMENTAL
The developed low frequency TDR is of 200 MHz range and 5ns rise time. The whole system consists of a water bath, transmission line, a strip type sample cell of length 5.5cm, Sample holder, temperature controller unit, oscilloscope, storage device etc. chemical grade Acetic Acid is used for the study. Eleven different molar concentrations (0.005, 0.01, 0.02 …….0.1) solutions are prepared with freshly collected distilled water. These solutions were kept at four different temperatures 25°c, 35°c, 45°c and 55°c. A strip like sample cell i. e. probe

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was immersed in the solution. These solutions were kept in the temperature controlled water bath. A fast rising step up pulse was send through the cable. The pulse strikes the sample and gets reflected back. Reflected pulse carries the information of the sample studied. The nature of the pulse depends upon the properties of the solution. The data was stored in the digital storage oscilloscope i.e. DSO. After every reading probe was thoroughly cleaned with acetone and dried.

RESULTS AND DISCUSSION

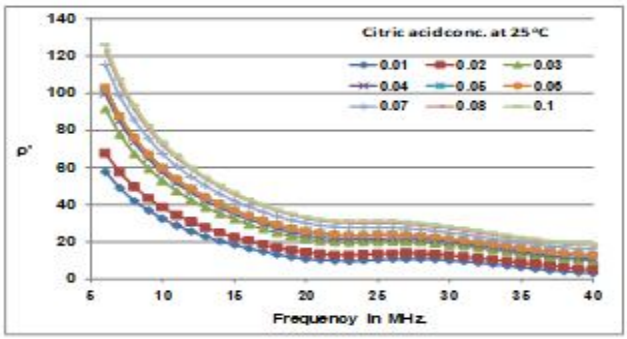
The reflected pulse without sample $r_1(t)$ and with sample $r_x(t)$ is recorded. The FFT (Fast Fourier Transform) of $(r_1(t)-r_x(t))$ and $(r_1(t) + r_x(t))$ is calculated by modifying waveforms with Nicolson's ramp method. The frequency dependent complex reflection coefficient (ρ*) is calculated using equation

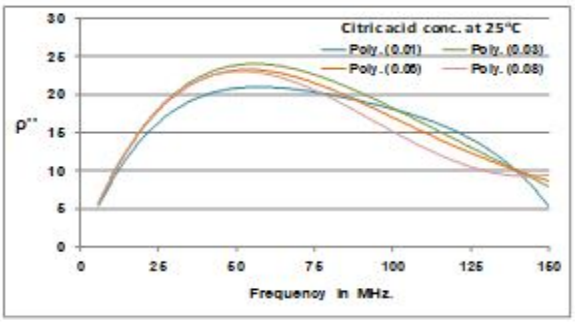
$$\rho^* = \frac{c}{lod} \times \frac{r_1 - r_x}{r_x + r_x}$$

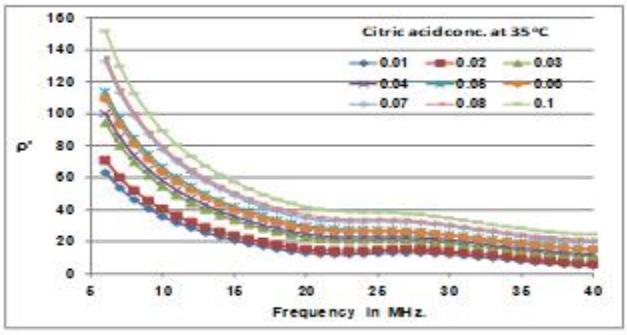
The computed values of real and imaginary part of complex reflection coefficient for aqueous solutions of preservatives are plotted in following figures. The real part is denoted as ρ' and imaginary part as ρ''.

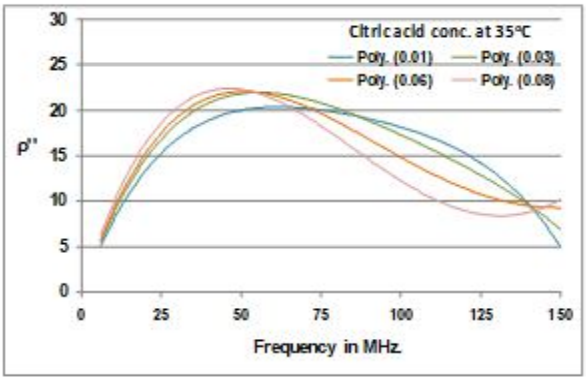
The separate graphs of ρ' and ρ" are plotted below to identify the variation in complex impedance of aqueous solutions of preservatives at different concentrations and at four different temperatures.

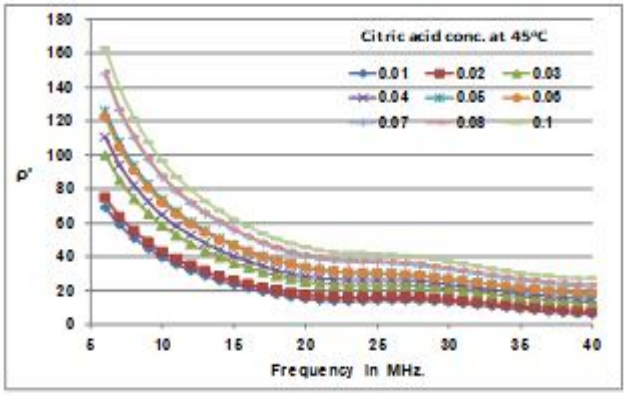
The graphs shows that the real part of Reflection Coefficient (ρ') is higher for lower frequency range. i.e. Reflection Coefficient (ρ') is inversely proportional to frequency. For lower temperature as well as concentration ρ' is low as we goes on increasing the temperature or concentration it increases. Similarly the changes are observed in the imaginary part of Reflection Coefficient (ρ"). Nature of the graph changes as the temperature and concentration changes.

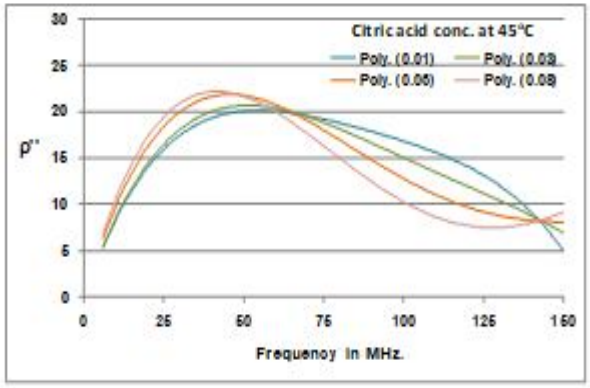












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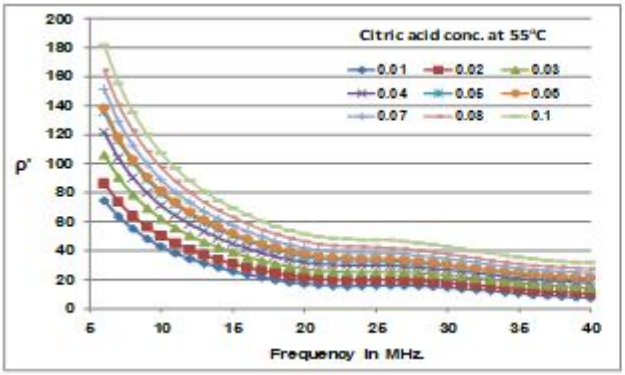

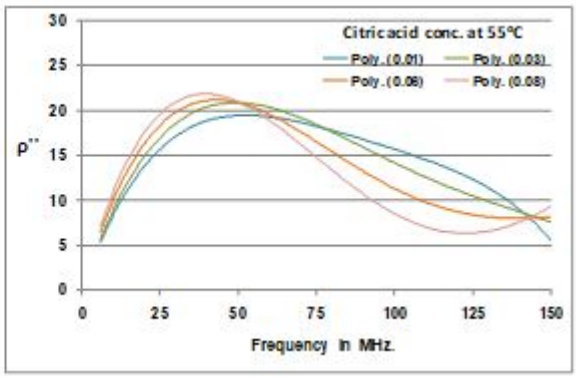

CONCLUSION

After the study of food preservative Citric Acid it was observed that the Reflection Coefficient of Citric Acid changes as the temperature and concentration of aqueous solution changes. This shows that the temperature and excess use of Citric Acid changes the strategy the solution or food stuff.

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ENVIRONMENTAL FRIENDLY SYNTHESIS AND ANTIMICROBIAL ANALYSIS OF FLUORINATED CHALCONE FROM FORMYL PYRAZOLE UNDER ULTRASONIC IRRADIATION

Bhagat S. S., Shirsat A. J., Rupnar B. D. and Gill C. H. [1]
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed (M. S.)
[1]Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (M. S.)
sunilbhagat2010@gmail.com

ABSTRACT
Chalcone is α, β-unsaturated carbonyl system having basic skeleton. These are 1, 3-diphenyl-2-propene-1-one made up of two aromatic rings are joined by a three carbon. These are found in plenty of amount in edible plants and flavonoids and isoflavonoids are made up from chalcones as precursors. Under sonochemical irradiation the synthesis of Chalcones is carried out by a base catalyzed Claisen-Schmidt condensation is the basic reaction. The newly prepared compounds were evaluated for their antimicrobial and antifungal activity against Gram +ve and Gram-ve microorganisms. Moderate activity was shown by some compounds against standard drugs.

Keywords: *Chalcones, Sonochemical irradiation*

INTRODUCTION
The chalcones have attracted a pronounced interest due to their uses as antibacterial, anti-inflammatory and anticancer pharmacological agents [1, 2]. Chalcones are important intermediates in the preparation of many pharmaceuticals. They are commonly made by the Claisen-Schmidt condensation between acetophenone and benzaldehyde. This reaction is catalyzed by acids and bases under homogeneous conditions. There are numerous methods existing for the synthesis of chalcones. The most commonly used is the base-catalyzed such as potassium hydroxide (KOH), sodium hydroxide (NaOH), lithium hydroxide ($LiOH{\cdot}H_2O$). and barium hydroxide $Ba(OH)_2$ Synthesizing chalcones with the help of the acid-catalyst like dry HCl, aluminum trichloride ($AlCl_3$), titanium tetrachloride ($TiCl_4$), boron trifluoride-etherate (BF_3- Et_2O), and ruthenium trichloride ($RuCl_3$)
Now a day's powerful technique emerging is Ultrasonic-assisted organic synthesis as a green synthetic approach that is being extensively used more and more to accelerate organic reactions [3]. This method is much convenient as compared with traditional methods, and reactions give higher yield, less reaction time and milder conditions. [4]
Ultrasonic irradiation leads to the acceleration of numerous catalytic reactions as well as in homogeneous and heterogeneous systems [5]. Furthermore, significant improvements can be realized as regards to the yields [6]. The sonochemical phenomena initiate from the contact between a appropriate field of acoustic waves and a possibly reacting chemical system; the interaction proceeds through the transitional phenomenon of acoustic cavitation. Three significant factors have to be measured when an ultrasonic prompted reaction is done: the acoustic field, the bubbles field and the chemical system [7].
Chalcones are also synthesized by condensing substituted o-hydroxy acetophenones with substituted pyrazole carbaldehyde in presence of suitable condensing agents. They undergo various chemical reactions and are found valuable in synthesis of important heterocyclic compounds. Chalcones have been used as intermediate for the preparations of compounds having therapeutic value. Based on the above observation it is worthwhile to prepare newer compounds for their antimicrobial and anti-inflammatory activities. In the view of the varied biological and pharmacological application, we synthesized some new heterocyclic derivatives of chalcones. Synthesis of chalcones has been carried out by Claisen–Schmidt condensation under sonochemical irradiation. Heterocycles containing nitrogen and sulphur moieties constitute the core structure of a number of biologically interesting compounds. During last three decades, Ultrasound has progressively been used in organic synthesis. A large number of organic reactions can be carried out in higher yields, shorter reaction time or milder conditions under ultrasound irradiation. As a part of our investigations on the application of ultrasound in organic synthesis, we wish to report an efficient and practical procedure for the synthesis of chalcones from fluorinated formyl pyrazole.

EXPERIMENTAL
Melting points were recorded in open capillaries in liquid paraffin bath and are uncorrected. TLC is used for the monitoring completion of reaction. IR spectra were recorded in KBr disc on Schimadzu-FT-IR Spectrophotometer. ^{1}H NMR spectra were recorded on Brucker Avance II 400 MHz instrument in DMSO-d_6 and an internal standard used is TMS. Peak values are shown in δ (ppm). Mass spectra were recorded on micromass Q-Tof Micro mass spectrophotometer. Bandelin Sonorex (with a frequency of 35 KHz and a

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nominal power of 200W) ultrasonic bath was used for ultrasonic irradiation. The reaction vessel placed inside the ultrasonic bath containing water.

General Procedure for the synthesis of 3-(2, 4-difluorophenyl)-1-(4-fluorophenyl)-1*H*-pyrazole-4-carbaldehyde (4):

A mixture of 4-fluoro acetophenone **1** (0.1mole), 4-fluorophenyl hydrazine **2** (0.1 mole), absolute ethanol (20ml) and catalytic amount of glacial acetic acid was stirred on magnetic stirrer with hot plate for ten minutes. The resulting faint yellow colour product was separated by filtration and washed with cold ethanol (50%) and dried under vacuum to get the compound **3**.

A mixture of dimethylformamide (0.1mole) and phosphorous oxychloride (0.6mole) was stirred at 0^oC for 30 minutes and then (Z)-2-(4-fluorophenyl)-1-(1-(4-fluorophenyl) ethylidene) hydrazine **3** (0.2 mole) was added at 0^oC with constant stirring. The reaction mixture was stirred overnight at room temperature and then poured over crushed ice; resulting product was separated by filtration and washed with cold sodium bicarbonate solution (10%) followed by water and crystallized from ethanol to get 1,3-bis(4-fluorophenyl)-1*H*-pyrazole-4-carbaldehyde compound **4.**

CONVENTIONAL METHOD

General procedure for the synthesis of (*E*)-3-(1, 3-bis (4-fluorophenyl)-1*H*-pyrazol-4-yl)-1-(5-chloro-2-hydroxyphenyl) prop-2-en-1-one (6c): A mixture of **4** (0.01 mol) and **5** (0.01 mol) was dissolved in 25 ml ethanol and contents were cooled to 0^oC in ice bath. To this reaction mixture, powdered 1.5g KOH was added and temperature is maintained below 5^oC. At room temperature the reaction mixture was stirred for 40hr. Then reaction mixture was diluted with water containing crushed ice and 2M HCl is added to acidify the mixture. Resulting product was separated by filtration and washed with ice cold water. Product was recrystallized from ethanol. This typical experimental procedure was followed to prepare other analogs of this series. Their physical data are given in **Table 1**

NONCONVENTIONAL METHOD

A mixture of **4** (0.01 mol) and **5** (0.01 mol) was dissolved in 25 ml ethanol in 100ml round bottom flask. To this reaction mixture, 1.5g powdered KOH was added. The mixture was irradiated by ultrasonic generator in a water bath keeping temperature 30-70^oC for 4hr. The reaction mixture containing solid product was poured over crushed ice and contents were acidified with 2M HCl. Resulting product was separated by filtration and washed with cold water. Product was crystallized from ethanol. This typical experimental procedure was followed to prepare other analogs of this series. Their physical data are given in **Table 1**and Antimicrobial data given in **Table 2 & 3.**

Compound 4: m.p.194-196^oC

IR(4) (cm^{-1}): 1102(Ar-F), 1524(C=C), 1647(C=N), 1685(C=O), 3190(CHO).

^{1}H NMR(4) (DMSO-d_6) δ ppm: 7.2299-7.2349(d, 1H, Ar-H), 7.2470-7.2519(d, 1H, Ar-H ,*J*=Hz), 7.2980-7.3034(d, 1H, Ar-H, *J*=Hz), 7.3200-7.3415(d, 1H, Ar-H, *J*=Hz), 7.9774-7.9868(d,1H, Ar-H, *J*= Hz),7.9912-7.9989(d,1H, Ar-H, *J*= Hz),8.0039-8.0095(d,1H,Ar-H),8.0132-8.0212(d,1H,Ar-H), 9.2155(s, 1H, pyrazoyl proton), 9.9916 (s, 1H, Ar-CHO).

ES-MS (4) (m/z): 285(M+1).

6c: m.p 173^oC

IR(6c) (cm^{-1}): 1014 (C-Cl), 1101 (C- F), 1158 (C-O), 1535 (C=C), 1472, 1575 (Ar C=C), 1644 (C=O), 3415 (-OH)

^{1}H NMR(6c)**:** 6.9608-6.9917(d, 1H, Ar-H, *J*=12.36Hz), 7.0136-7.3767 (m, 4H, Ar-H), 7.4653-7.5294 (m, 1H, Ar-H), 7.6510-7.7192(m, 2H, Ar-H), 7.7511-7.9798(4H, d, CH=C, *J*=15.2 Hz), 8.1180-8.1854(d, 1H, Ar-H, *J*=8.8Hz), 9.3890 (s, 1H, pyrazole =CH), 12.6417 (s, 1H, -OH).

ES-MS (6c) (m/z 435(M-1),437(M+2)

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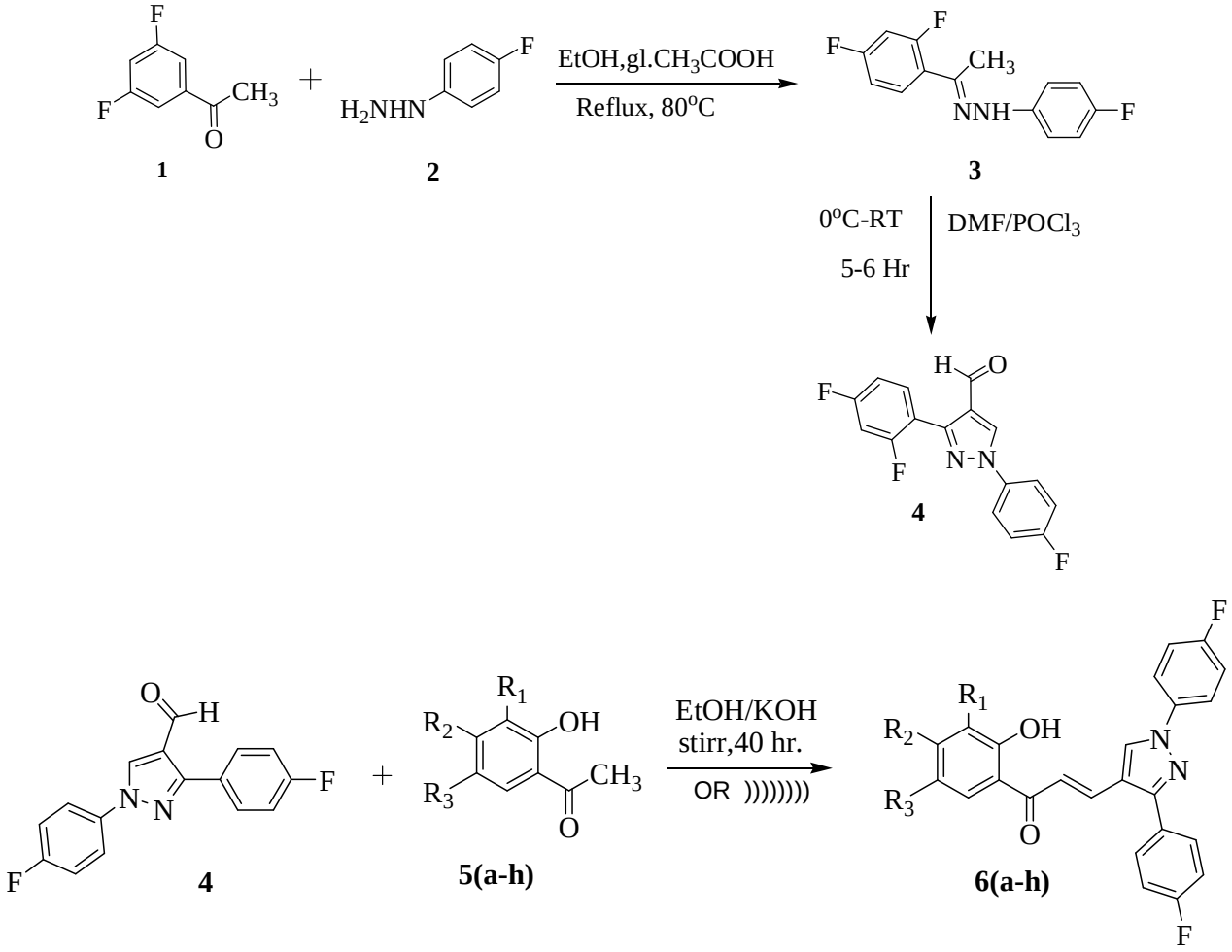
Scheme



Scheme-1: Synthesis of various substituted (*E*)-3-(1, 3-bis (4-fluorophenyl)-1*H*-pyrazol-4-yl)-1-(5-chloro-2-hydroxyphenyl) prop-2-en-1-one

Table-1: Physical data of compounds 6(a-h)

					Conventional Method		**Nonconventional Method**	
Compd.	**R_1**	**R_2**	**R_3**	**M.P. (^oC)**	**Time (hr)**	**Yield (%)**	**Time (min)**	**Yield (%)**
6a	H	H	H	172-174	48	71	240	78
6b	H	H	CH_3	178-180	40	76	240	78
6c	H	H	Cl	194-196	40	60	240	65
6d	Cl	H	Cl	202-204	40	85	240	88
6e	H	H	F	200-202	40	62	240	69
6f	H	CH_3	Cl	138-140	40	64	240	70
6g	H	H	Br	226-228	40	76	240	80
6h	CH_3	H	CH_3	222-224	40	70	240	74

RESULTS AND DISCUSSION

Antimicrobial Activity:-Compounds **6** were screened for their in vitro antimicrobial activity against *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus albus, Staphylococcus aureus, Klebsiella pnuemoniae, Pseudomonas sp.*using Ciprofloxacin as a reference standard drug by paper disc diffusion method and agar well method. Antifungal activity was evaluated against *Candida sp.* using Fluconazole as standard drug. All the tests were evaluated at 100 µg/ml concentration. The culture media was Muller hinton agar. The zone of inhibition was measured in mm after 24 hr. of incubation at 37°C. **6a, 6e, 6f, 6g** shows moderate antifungal activity. All the compounds show good to moderate antibacterial activity against above mentioned bacterial species. DMSO is used as control.

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Table-2: Antimicrobial data of compounds 6(a-h)
Disc Diffusion Method

Sample	Inhibition Zone Diameter (mm)					
	Candida sp.	***Staphylococcus aureus***	***Staphylococcus albus***	***Klebsiella pnuemoniae***	***Escherichia coli***	***Pseudo monas sp.***
6a	8	7	9	1	14	10
6b	No zone	8	10	11	12	10
6c	No zone	8	12	11	12	No zone
6d	8	No zone	9	9	No zone	No zone
6e	11	9	7	10	8	No zone
6f	10	No zone	7	10	10	No zone
6g	10	No zone	No zone	10	10	No zone
6h	No zone	No zone	10	No zone	9	No zone
Control (DMSO)	8	3	3	6	7	10
Ciprofloxacin	---	20	22	22	21	23
Fluconazole	23	---	---	---	---	---

Table-3: Antimicrobial data of compounds 6(a-h)
Agar Well Method

Sample	Inhibition Zone Diameter (mm)					
	Candida sp.	***Staphylococcus aureus***	***Staphylococcus albus***	***Klebsiella pnuemoniae***	***Escherichia coli***	***Pseudo monas sp.***
6a	No zone	8	6	No zone	3	2
6b	No zone	11	10	3	5	4
6c	No zone	6	4	6	4	10
6d	No zone	7	12	8	5	No zone
6e	No zone	9	7	8	No zone	No zone
6f	10	13	No zone	7	8	10
6g	11	7	No zone	10	8	No zone
6h	8	9	13	12	10	No zone
Control	8	3	3	4	6	10
Ciprofloxacin	---	20	22	22	21	23
Fluconazole	23	---	---	---	---	---

CONCLUSION

All the synthesized compounds were screened for antimicrobial activity. In-*vitro* activity data is presented in **Table 2 &3**. All the compounds screened showed moderate to good antibacterial and antifungal activity comparable with that of standard drug tested.

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POVERTY IN INDIA & SCHEDULED CASTES, SCHEDULED TRIBES

Jogdand B. S.
Department of Economics, R. B. Attal College, Georai, Dist. Beed (M. S.)
balajogdand@gmail.com

ABSTRACT
Poverty refers to the condition of human beings, in which the human beings can not meet their basic needs. The number of poorer nations in the world is terrible. The concept of poverty varies from country to country. Nevertheless, its support is expected of a minimum life expectancy ie better life. This means that there is a concept of poverty in India, it is different from Japan, in Norway different from that, and in a different way than in the United States. Because the people of every nation are different from their standard of living.

Keyword: *Poverty, Absolute poverty, Relative poverty*

INTRODUCTION
In India, poverty estimation is done on the basis of consumption capacity. While analyzing poverty, the concept of absolute poverty and relative poverty are studied. The observer's concept of poverty is related to the price level. The person, who can not meet the minimum requirements from his income, is called absolute poverty. When two people or groups are compared, they are called Relative Poorness. When compared to the high income and low income in the same group or country, it is said to be relatively poor.

In India, certain economists and various organizations have set certain criteria in their respective ways. According to the report, "Task Force on minimum needs and effective consumption demand" committee commissioned by the Planning Commission, according to the report, 2,400 calories per day in rural areas and 2 thousand 2100 calories per day in urban areas is not achieved per person, it should be said below poverty line people.

The Tendulkar Committee has calculated the poverty per capita monthly consumption expenditure. In 2012, Dr. C. Rangarajan Committee constituted the poor people who spent less than 1407 per month in the urban areas, 47 per day, and the rural population spent 972 rupees per month, ie 32 rupees per day.

THE NATURE OF POVERTY IN INDIA
The nature of poverty in India is broadly rural, whether it is in rural areas or both the state of the state or the backwardness of poverty is aware of every aspect of the population. According to the 2011 Census report, 31.2 per cent of the population is urban in urban areas and 65.8 per cent of the population is critically ill in both parts of the realm. . The reasons for poverty are different in rural areas and urban areas. Employment opportunities in rural areas are available in this small scale. Also, the seasonal unemployment rate is higher in rural areas. There is a lack of training in rural areas. There is less likelihood of finding jobs in other than agriculture. In rural areas old customs are widely seen. This is why people in large numbers get financial loss in the area.

Along with the number of educated unemployed in the urban areas is high. The technical unemployment rate also appears. Employment is not available due to lack of training in many cases. In addition to these, many causes are responsible for poverty, natural disasters, addiction, sloth, slow economic development, evil cycle of poverty and regional imbalance

National Poverty Estimates (% below poverty line) During 1993-94 to 2011-12

Year	Rural (%)	Urban (%)	Total (%)
1993-94	50.1	31.8	45.3
2004-05	41.8	25.7	37.2
2009-10	33.8	20.9	29.8
2011-12	25.7	13.7	21.9

Source: Poverty Estimate, 2011-12 Planning Commission

When considering the whole of India, in 1993-94, India's poverty ratio was 45.3%. Among these, the poverty ratio in rural areas was 50.1 and the urban poverty ratio was 31.8%. In rural areas, the rural population was 33.8% in 2009-10 and 20.9% in urban areas was 20.9%. The percentage of total poverty ratio was 21.9%, whereas in rural areas, the poverty ratio was 25.7% and the urban area was 13.7%.

Along with the number of educated unemployed in the urban areas is high. The technical unemployment rate also appears. Employment is not available due to lack of training in many cases. In addition to these, many

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causes are responsible for poverty, natural disasters, addiction, sloth, slow economic development, evil cycle of poverty and regional imbalance. State wise wise state of India:

State wise Poverty Ratio in India

Sr.No	State	Rural Poverty in %	Urban Poverty in %	Total Poverty in %
1	Andhra Pradesh	22.8	17.7	21.1
2	Arunachal Pradesh	26.2	24.9	29.5
3	Assam	39.9	26.1	37.9
4	Bihar	55.3	39.4	53.5
5	Chhattisgarhi	56.1	23.8	48.7
6	Delhi	7.7	14.4	14.2
7	Goa	11.5	6.9	8.7
8	Gujarat	26.7	17.9	23.0
9	Haryana	18.6	23.0	20.1
10	Himachal Pradesh	9.1	12.6	9.5
11	Jammu-Kashmir	8.1	12.8	9.4
12	Jharkhand	41.6	31.1	39.1
13	Karnataka	26.1	19.6	23.6
14	Kerala	12.	12.1	12.0
15	Madhya Pradesh	42.0	22.9	36.7
16	Maharashtra	29.5	18.3	24.5
17	Manipur	47.4	46.4	47.1
18	Meghalaya	15.3	24.1	17.1
19	Mizoram	31.1	11.5	21.1
20	Nagaland	19.3	25.0	20.9
21	Odessa	39.2	25.9	37.0
23	Punjab	14.6	18.1	15.9
24	Rajasthan	26.4	19.9	24.8
25	Sikkim	15.5	5.0	13.1
26	Tamilnadu	21.2	12.8	17.1
27	Tripura	19.8	10.0	17.4
28	Uttar Pradesh	39.4	31.7	37.7
29	Jharkhand	14.9	25.2	18.0
30	West Bengal	28.8	22.0	26.7

Source: NSSO

Looking at the statistics of the Northeast states, except for Manipur, the poverty ratio is low in Meghalaya, Mizoram, Nagaland and Arunachal Pradesh. There is a high proportion of poverty in the state of Assam along with Manipur. While the state is small in size, the poverty ratio is low. On the other hand, Bihar, Jharkhand, Chhattisgarh, Odissa and Uttar -Pradesh have higher poverty levels.

Urban Poverty by State & by Social Group Based on the Lakdawala Lines Using URP Expenditures: Scheduled Castes, Scheduled Tribes (%)

State	ST					SC				
	1983	*1987-88*	*1993-94*	*2004-05*	*2009-10*	*1983*	*1987-88*	*1993-94*	*2004-05*	*2009-10*
Andhra Pradesh	43.0	51.8	45.6	51.9	24.9	52.1	49.7	45.8	37.4	20.7
Bihar	51.2	54.6	35.0	57.2	11.4	64.6	62.5	57.0	66.9	45.2
Delhi	5.4	11.0	9.1	0.0	68.9.	53.0	47.6	48.9	40.5	36.4
Gujarat	83.2	64.0	35.6	21.0	13.4	43.8	50.0	45.9	17.8	23.3
Haryana	20.1	20.1	0.0	0.0	66.2	48.5	41.2	25.3	33.3	19.9
Himachal Pradesh	20.4	0.0	0.0	2.4	18.6	23.7	18.4	20.1	5.0	15.0
Karnataka	51.6	69.9	62.7	61.9	36.9	50.6	62.6	62.8	50.3	36.9
Kerala	59.5	30.6	0.0	21.8	18.3	60.1	58.0	33.4	33.4	26.1
	54.8	66.4	66.8	44.7	45.8	68.4	69.9	63.9	68.4	47.3
Maharashtra	67.0	64.1	60.5	40.9	35.7	66.0	61.2	53.8	42.8	38.2
Orissa	73.7	61.4	62.8	64.6	51.2	69.8	59.5	45.5	74.5	51.8
Punjab	56.3	18.7	0.0	2.4	0.7	36.1	26.2	26.9	14.3	13.8

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Rajasthan	50.6	27.9	8.4	27.9	24.4	49.1	54.6	49.7	55.1	34.0
Tamilnadu	74.8	51.8	25.0	33.1	20.5	69.6	63.3	61.5	41.2	28.4
Uttar Pradesh	33.4	49.8	27.9	37.6	18.7	57.8	57.1	59.0	43.5	36.4
West Bengal	42.4	43.3	23.5	22.2	12.1	48.9	49.8	38.7	25.5	21.8

Source: Asian Development Review, Vol. 31, no1, pp I-52

(Arvind Panagariya & Mehga Mukim : A Comprehensive Analysis of Poverty in India)

In the above table, the status of poverty in the Schedule Castes and Scheduled Tribes has been shown. Status of the state or the backward is a real challenge. Among all the states, Andhra Pradesh, Bihar, Karnataka, Maharashtra, Orissa, Uttar Pradesh and West Bengal show the poorest of the population among the Scheduled Castes and Scheduled Tribes.

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CHALLENGES OF WOMEN EMPOWERMENT IN INDIA

Kale R. B.
Department of Sociology, R. B. Attal College, Georai, Dist. Beed (M. S.)
revennathbkale@gmail.com

ABSTRACT
The present paper analysis the status of women empowerment in India and highlight the challenges of women empowerment. Education among women is the most powerful way of attaining power in the society. Empowerment of women is basically the process of upliftment of economic, social and political status of women, the traditionally under privileged ones, in the society. It is the process of protecting them against all forms of violence.

Keyword: *Status of women, illiteracy, sex ratio.*

INTRODUCTION

Empowerment is the process to help everyone to think, approve and act independently. This is the process which one can control the fate and life situation of one's life. Empowerment involves control over resources physical, social, intelligent, economic and ideology. Women's empowerment is vital for the development of society. Empowerment means being able to think and act independently, to choose and to have the power to fulfill their capabilities like the fulfil and equal member of society.

OBJECTIVES OF PAPER

1. To understand the meaning of Women Empowerment's

2. To Know the Challenges of Women Empowerment in India.

DATA COLLECTION

The secondary data has collected through reference books, journal, internet for this research paper.

DEFINITION OF WOMEN EMPOWERMENT

"Women's economic empowerment refers to the ability for women to enjoy their right to control and benefit from the resources, assets, income and their own time, as well as the ability to manage risk and improve their economic status and well-being."

THE TERM WOMEN EMPOWERMENT MEANS WOMEN (UNIFEM)

-"Acquiring knowledge and understanding of gender relations and the ways in which these relations may be changed".

-"Developing a sense of self-worth, a belief in one's ability to secure desired changes and the right to control one's life. "

-"Gaining the ability to generate choices exercise bargaining power".

-"Developing the ability to organize and influence the direction of social change, to create a more just social and economic order, nationally and internationally".

India is a patriarchic country. The status of woman is low in the society. Many social reformers tried to empower women. The constitution has given all the rights and freedom to her, many women movements have been trying to empower them, sometimes new regulations and rules are created for them. Some work is also done at government level, but Indian women could not be empowered totally. Definitely some changes have occurred, some women are working in male dominant fields, some have entered in politics, business also, but expected success did not come to them yet.

Mahatma Phule, Mahatma Gandhi, and Dr. B.R. Ambedkar thought that, woman is great than man in so many ways. Naturally woman is powerful. She has many qualities than man like sensitiveness, patience, mercy, kindness, loving. She is mother. So how she is weak? Why there is need to empower her? Naturally woman is empowered but, the selfish patriarchal system has made woman wead in India. So many efforts failed to empower women in India. There are some challenges before women empowerment in India which are discussed below.

Religious mentality is one of the challenges before women empowerment. Sociologists proved many times that the influence of religion is more on women than men. There are many ways to exploit women in religion, even

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though she obeys all the customs and rituals of it. The issue of Shani Mandir in Maharashtra is very recent. Women are not permitted on chauthara. Many women movements are fighting /conflict to enter women in temple. But many women opposed him

. Because such women became blind by religious blind faith, she does not understand that, she shoots oneself in the foot. When Dr. Babasaheb framed Hindu code Bill, women were in front to opposite it. So such religious mentality would not empower to women.

The lack of education is one important obstacle of women empowerment. If we glanced on Indian literacy rate since 1901, then we will find that women literacy rate was very low till today. According to census report 2011, the literacy rate is 74.0 out of which she is mother women literacy is 65.5and male literacy is 82.1. Here it is clear that, there is gap between male and female literacy. The dropout rate of girls is also high due to marriage, money problems, mentality of rural people many girls leaved their education incomplete. The ratio of women in higher education is very low too. Women would not be empower only through literacy, it is needed to give quality education to them.

WOMEN LITERACY RATE IN INDIA

S. N.	Census year	Persons	Gap in Male- Female Literacy Rate (in %)
1.	1901	5.4	9.2
2.	1911	5.9	9.6
3.	1921	7.2	10.40
4.	1931	9.5	12.7
5.	1941	16.1	17.6
6.	1951	18.33	12.30
7.	1961	28.3	25.05
8.	1971	34.45	23.98
9.	1981	43.57	26.62
10.	1991	52.21	24.84
11.	2001	64.83	21.59
12.	2011	74.04	16.68

"Sources: census 2011, India 2016"

Women are themselves a challenge for women empowerment in India. Women preference to boy and neglect girls, some mother in-laws is responsible dowry. The quarrels between mother in-laws and daughters in laws are common in India. If it is not stopped, women could never be empowered. So women are needed to help each other and solve their problems and fight with male dominated mentality.

The male female ratio though improved over last few years is still far from satisfactory level, on average 940 women there are 1000 men. But the age group of child sex ratio (0-6 age group) is declined. This child sex ratio (914) is lowest since Independence. It was 927 in 2001 and 914 in2011. In India, sex ratio in some states are as much lower as 877. There are the states where the rate of female feticides is higher.

Patriarchal family is another challenge for women empowerment. Such type of society closes the door of development for women. Woman is closed among four walls child and cooking are left to her. She has not decision power in family. She has not any economic rights. Her life depends on her husband or other male member. So the patriarchal society created inequality in society so eradicate it and establish equality in society.

There were some laws made for women empowerment in India like 73rd amendment, 33% and 55% reservation, Domestic Violence Act, etc. But such laws are poor, because many women become Sarpanch, President of Z.P. etc. but males use actual power and authority of women. They should be strictly prohibited. Otherwise women will be only puppets in the hands of men.

CONCLUSION

We can conclude here that, Woman is naturally empowered. She is great in ways than man. But the social system of India made weak her. Blind religious mentality is basic obstacle of women empowerment. Patriarchal family is also main challenge of women empowerment, because there are no any authorities to women to develop themselves. Education facilities could not reached to all people. Not only literate to women but provide quality education is necessary. Poor law system, traditions, woman herself, diversity of India these are also challenge of women empowerment. Without rationality, quality education, strict rules and regulations, matriarchal family we would not empowered women in India.

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EFFECTS OF YOGIC PRANAYAMA ON HEART RATE AND BLOOD PRESSURE ON SEDENTARY STUDENTS

Pagare S. B.
Department of Physical Education, R. B College, Georai, Dist. Beed (M. S.)
spagare001@gmail.com

ABSTRACT
The objective of the study was to determine the Effects of yogic pranayama on heart rate and blood pressure on sedentary students. In all, thirty sedentary Students group was targeted experimental group whose age ranged between 15-25 years. This study involves the effects of Yogic Pranayama heart rate and blood pressure in quasi experimental research design. The data was collected through respondents in the form of different experimental tests. The demographic information about Age, height, weight etc. was obtained before seeking responses. Resting heart rate and blood pressure of each subject was recorded before & after training. The blood pressure is the pressure of the blood within the arteries. Training program would be planned as 12 weeks 4 days a week and 60 min. The yogic Pranayama includes Kapalbhati ,Anulom Vilom ,Bhastrika etc. before starting Yogic Pranayama the demonstration was given to the students. The result of the study shows that there was a significant effect of pranayama on heart rate in sedentary students. The result also indicates that there was a significant effect of pranayama on Systolic Blood Pressure in sedentary students. However, there was in significant effects of pranayama on Diastolic Blood Pressure in sedentary students

Keywords: *Pranayam, sedentary, Blood pressure, Kapalbharti*

INTRODUCTION
Pranayama is one of the central teachings in classical yoga (Hari Dass, 1999; Muktibodhananda, 2006). Pranayama means control and regulation of breath. Prana" is a Sanskrit word, which means "Vital Force". It also signifies "life" of breath. "Ayana, Means the control of the pran so pranayama means the control of the vital force (Prana) by concentration and regulated breathing.Prana is the vital power or force, which is motivating every element on the earth and is the airgun of the force of thought. The objective of pranayama is to inspire, Motivate, regulate and balance the vital force prevailing in the body. It cleanses the body and knowledge is manifested pranayama is called the soul of Yoga. Bathing is necessary for purifying the body similarly, pranayama is essential for purifying the mind. The prevalent aim of pranayama in sports is to strengthen the nervous system. It also increases the concentration power of mind.

It is gratifying that science has started studying the effects of yogic techniques, while yoga has started using modern technology and scientific methods.Scientific research has shown that yogictechniques produce consistent and beneficial physiological changes. A few weeks of disciplined yoga practice can lead to improvement in many physiological and psychological functions. Practice of pranayama results in an overall improvement incardio-respiratory functions and physical fitness which improves one's tolerance to stressors

Yogic practices alter the hypothalamic discharges leading to decrease in sympathetic tone and peripheral resistance and hence the diastolic blood pressure.Regular yogic practices strengthen the respiratory muscles; increase the excursions of diaphragm andlungs as well as thoracic compliance.

TARGET POPULATION
Total thirty, sedentary Students group was targeted experimental group whose age ranged between 15-25 yrs.

RESEARCH DESIGN:
The design in a research study refers to "the researcher's overall plan for answering the researcher's question or testing the research hypotheses". This study involves the effects of Yogic Pranayama heart rate and blood pressure in quasi experimental research design.

DEMOGRAPHIC INFORMATION
The data was collected through respondents in the form of different experimental tests. The demographic information about Age, height, weight etc. was obtained before seeking responses.

RESTING HEART RATE
Resting heart rate of each subject was recorded before & after training. Before recording Resting heart rate the subject was instructed to remain lying on their bed to record the heart rate, Heart rate was recorded by the palpation at redial artery per minute. The score was express in number of heart rate per minute.

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BLOOD PRESSURE

The blood pressure is the pressure of the blood within the arteries. It is produced primarily by the contraction of the heart muscle. Blood pressure Device was used to measure Blood pressure

TRAINING PROGRAMME

Training program would be planned as 12 weeks 4 days a week and 60min. The yogic Pranayama includes Kapalbhati ,Anulom Vilom ,Bhastrika and nadi shodhan before starting above Yogic Pranayama the demonstration was given to the students.

COLLECTION OF DATA

Data was taken from the 30 students as an experimental group of similarly Pre and Post Test was taken from 30 other students as a control group. Yogic Pranayama was given to the experimental group only.

STATISTICAL ANALYSIS

The obtained data was in Pre & Post form therefore to analysis the obtained data Mean, Standard Deviation and t ratio was utilized by the investigator. The level of significant was set up at 0.05 level.

RESULTS OF THE STUDY

The results concerning this are presented in the form of tables and also illustrated with the help of suitable figures where ever necessary. For the sake of convenience and methodical presentation of the results, following order has been adopted.

Table-1: Shows Mean Scores and Standard Deviations of Morphological characteristics of the Experimental groups

Sr. No.	Components	Means Scores	Standard Deviation
1.	Age (Year)	21.66	4.67
2.	Weight (Kg)	66.10	9.08
3.	Height (cm)	170.67	16.02

Mean Score (S.Ds.) age of experimental group was 21.66 (4.67) years, mean score (S.Ds.) height was 66.10 (9.08) kg., mean score (S.Ds.) and height was 170.67 (16.02) cm,

Table-2: Mean score standard deviation and t-ratio of Heart rate in pre and post-test of Experimental group.

Efficiency	Test	Number	Mean	S.D.	
Heart Rate	Pre Test	30	75.40	5.76	Significant at 0.05 level
	Post Test	30	72.13	4.67	

Significant at 0.05 level

Table -2 Shows that mean scores and standard deviation of heart rate of pre and post-test of Experimental group.With regards to pre and post-test of Experimental group they have obtain the mean value of **75.40** and **72.13** respectively. The result of the study shows that therewas significant effects of pranayama on heart rate in sedentary students.

Table-3: Mean score standard deviation and t-ratio of systolic blood pressure in(pre and post-test) Experimental group.

Efficiency	Test	Number	Mean	S.D.	T-ratio
Systolic Blood Pressure	Pre Test	30	126.89	9.78	Significant at 0.05 level
	Post Test	30	121.34	9.05	

Table -3 Shows that mean scores and standard deviation of selected physiological efficiency with respect to heart rate of pre and post-test of Experimental group.With regards to selected physiological efficiency in heart rate of pre and post-test of Experimental group they have obtain the mean value of 126.89and 121.34respectively. The result of the study shows that there was significant effects of pranayama on Systolic Blood Pressure in sedentary students

Table-4: Mean score standard deviation and t-ratio of Diastolic blood pressure in (pre and post-test) Experimental group

Efficiency	Test	Number	Mean	S.D.	T-ratio
Diastolic Blood Pressure	Pre Test	30	85.78	9.78	Not Significant
	Post Test	30	84.89	9.05	

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Table -4 Shows that mean scores and standard deviation of pre and post-test of **Diastolic** Blood Pressure in Experimental group. With regards to selected physiological efficiency in heart rate of pre and post-test of Experimental group they have obtain the mean value of 85.78and 84.89 respectively. The result of the study shows that there was in significant effects of pranayama on **Diastolic** Blood Pressure in sedentary students

DISCUSSION OF FINDINGS

The present study deals with the effects of Yogic Pranayamaon heart rateand Blood pressure in sedentary students.Several studies also examined resting cardiovascular variables, such as heart rateand blood pressure prior Cowen and Adams (2005) found significant decreases in resting diastolic blood pressure over a six-week training periodon. Telles, Nagarathna, Nagendra, andDesiraju (1993) also found decreases in diastolic blood pressure as well as systolic bloodpressure and decreased resting heart rate in 40 male physical education teachers (aged 25-48 year), whom attended a three month residential yoga training camp and engaged in 90minutes of yoga daily.Konar, Latha, and Bhuvaneswaran (2000) observed a significant decrease inresting heart rate in 8 healthy males (aged 17 – 18 years) following the practice of oneyoga posture for approximately 8 minutes daily for a period of two weeks. Theparticipants engaged in shoulderstand, a posture in which the body is inverted with thelegs perpendicular to the floor, hands resting on the lower-back and the upper-arms andshoulders are pressing into the floor. Shoulderstand is a highly regarded yoga posture inwhich health benefits to the cardiovascular system are received due to the inverting of thebody, thereby reducing the work performed by the heart.

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NAAC ACCREDITATION AND THE COLLEGE LIBRARY IMPROVEMENT

Pagore R. B.
Librarian, R. B. Attal College, Georai, Dist. Beed (M. S.)
pranjeet23@gmail.com

ABSTRACT
NAAC accreditation is part of any good institution; the accreditation process provides guideline for improving the quality of works of departments, Library and entire institution. The NAAC Accreditation process is totally user (Stakeholder) centric and the facilities and services usage gives a good academic score. This accreditation process changes the total scenario and improvement in infrastructure and service of college libraries in all over India. This paper focus on college library's collection development policy, status of automaton, extension activities and services, best practices and utilization of information resources are study with the reference to set of questions prepared for library by the NAAC.

Keywords: *NAAC accreditation, ICT infrastructure, E-Resources, library improvement, Library Services, Best Practices*

INTRODUCTION
The world is becoming a world village today. To compete with the world, higher education at the national level and internationally acceptable standards are necessary. "Quality" has become a word in this competitive world. Skilled and well-known citizens can contribute to their performance and value-added services. Therefore, the quality of education is also important.

National Assessment and Accreditation Council (NAAC) is an autonomous institution established by the university Grants Commission (UGC), under section 12-CCC of the UGC Act of 1956. It has been registered under the Karnataka Societies Registration Act of 1960, the Karnataka Societies Registration Rules of 1961 as on September 16, 1994 and is located at Bangalore. It is a Quality Assurance Agency (QAA) meant for assessing and accrediting Higher Education Institutions (HEIs) of the country.

The UGC has entrusted the responsibility of higher education at the national level to the highest institution of higher education in India. National Policy on Education (1986) has expressed concern about the failure of the education system in India. On the recommendations made in Action Program (1992), UGC established an autonomous organization to evaluate and certify the institutions of higher education in India in 1994. This fund is available from the UGC Government. India is headquartered in Bangalore. At its glance, it is said that "quality defined by higher education in India by chance by the introduction of self-quality and external quality evaluation, promotion and livelihood." Based on this process, they have developed guidelines for organizations that invite this process. Grade or evaluation result is valid for only five years. After this period the institution needs to be re-approved and the entire process is re-invited. Considering the role of educational institutions in fulfilling the purpose of higher education, the work of the organization is done from different corners.

In the recognized process, the entire system of the organization is brought under the scanner. He is well-crafted by quality indicators or guides who take care of each component by acting as an independent input unit.

Students are involved in the initially accredited process with the institution. At the same time, alumni like external students, members of the parent-teacher organization, will also participate in different phases of this process. Initially, the organization should take the initiative to go to a recognized NAAC. In the first phase, the institution has to get organizational qualification for natural evaluation before going for certification by NAAC. After getting sanctioned, the organization has to prepare its performance based on seven criteria, the self-study report (SSR) and this report is presented to the NAAC. The domestic analysis of the report is done by NAAC. The next step is to prepare for the report of the preparation of evaluation results for visits and visits to the Associate Site for the certification of SSR. Finally, the grade is given by the NAAC's Executive Council.

LIBRARY IN THE ACCREDITATION PROCESS
All the components of the organization are classified under seven heads or criteria. They are an educational perspective, education-learning and assessment, research, advice and expansion, infrastructure and education resources, student support and progress, organization and management, and healthy practices. Each of these criteria is given by the score. Under the fourth criteria of infrastructure and learning resources, the library is a unit. In this title, physical facilities like buildings, libraries, playgrounds, hostels, canteens, computer labs, health care centres and other general amenities are checked. Only 20 marks have been allocated for the library's 100 marks in the library so that their role as a major basic system of education will be highlighted.

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As an important component of the educational institution library, students are encouraged to progress in their academic and co-curricular efforts. This is a place for self-study and self-growth. This class teaches learning and provides a platform where students can develop their potential abilities using library resources and services. In other words, libraries support in the education, education and research process. In recent years, significant growth has been reported in library and information services

Internet and Web sources Information is hidden in various formats; IT has influenced the traditional establishment of the chest. College courses are updated, new courses are started, and self-financing courses occupy an esteemed position in colleges. The College Library must maintain its challenges and maintain its challenges by updating the service. With all these developments in the organizational environment, the development of ICT and the emergence of new media in the world, libraries have changed their role and made new responsibilities. Therefore, the library is focused on a recognized process.

GUIDELINES ON QUALITY INDICATORS IN LIBRARY SERVICES

NAAC Published Special Guideline on quality indicators in library services providing directions in organization and development of library. This guideline helps library to improve services and update the status of library. Hence the standards for assessing the quality of library services are updated from time to time.

In NAAC Accreditation library evaluation is an essential component, where collections, services and their outreach capability are maintained. Recently, significant development has been done in libraries and information services, and libraries are taking new responsibilities in higher education. Therefore, it is necessary to update the standard of libraries to evaluate the quality of services. It is true that libraries support education, education and research in a large number of institutions. Till now, most of the time, the group has been the primary source of learning, primarily by granting genetically based conditions. Over the next few days, a person can change the role, and indeed, in increasing learning-oriented learning efforts, often playing an important role in the teaching of primary language, libraries can often become witnesses of becoming primary education sources. In the case of Open Distance Learning (ODL), it was always there.

INFRASTRUCTURE

The libraries' location can be seen to see that the library has its own space or organization of proper planning and space and includes proper furniture, required quantities and reading chair, table, display rack, magazine rack etc. Keep in mind that the minimum carpet area with appropriate ventilation, fans and water and toilets facilities for service counters and other library departments, set by government and other government agencies. It is necessary to pay attention to the uninterrupted power supply system (UPS, generator, etc.) as well as maintenance and cleanliness of the entire building.

COLLECTION

The library must provide various, authoritative and up-to-date resources that support its work and its users' needs. Resource at main campus and / or off-campus locations can be provided onsite or remote storage locations. Besides, sources can be in various formats, including print or hard copy, online electronic text or images and other media. The University / College should have the number of resources set by the government, UGC / AICTE and other government agencies. They can usually be in books, text books, standard references, current newspapers, in which national, international and reviewers have reviewed journals, rear volumes, full text / secondary database, CD / DVD, AV content etc. Library and National Agencies (World Bank, UNO, EU, UGC, DST etc.) can maintain a special collection of government documents, book-bank, rare materials, civil services / collections for competitive exams etc. In limited budgets, libraries can potentially find ways to provide resources most effectively, like free access sources.

MANAGEMENT OF THE LIBRARY

In colleges, the main purpose of the library is to support educational programs and libraries to develop its collections and services largely to reflect the needs of its users. Additionally, libraries can create a system to deliver your products and services to attract more users. Finally, the library aims to bring all our target users to the library and ensure optimum utilization of resources. The libraries of the recognized library can make their performance by enabling / enabling them to answer the following questions in a positive library supporting voluntary collections and educational services through various services. Reaching out to all users is a challenging task. The library is seen as an independent body. Libraries can work effectively with a well-defined process. Library is required by the NAAC Library Advisory Committees and its role, availability of funds from various sources, eligibility and training facilities for library staff, compilation development, books, stock, maintenance and cleanliness.

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UTILIZATION OF THE LIBRARY SERVICES

Various details have been reported for the use of the available services, during the working of the library (including Sundays and holidays, and before and after the time of the examination). Facilities like computer and internet connectivity, reprographic service, status of library automation, free access system, number of books issued every day; penalties etc. are the main questions. Various services are listed in the guidelines such as seminars, clippings, bibliographic service etc. It is necessary to explain inter libraries, debt servicing, and user orientation and information literacy programs. The evaluation of the services used is done by different data like average number. Broadcast books, numbers. Got answers related to the questions Number of students visiting the library, Number of Library for teachers, new arrivals, and awareness services etc.?

BEST PRACTICES: ENHANCE THE ACADEMIC INFORMATION ENVIRONMENT AND USABILITY.

In relation to the library, 'best practice' can be seen as one which is contributing to the full report of the educational capacity of the user by the satisfaction of the user. Below is an indicator set of best practices?

Best practice includes library automation through standard library digital software, library information brochure, library feedback from stakeholders through scientifically designed questionnaire, information literacy program, Digital repository of different information sources, library website as information tool for users, Development of electronic environment on the campus and encouragement to e-deliveries and access of different consortia like INFLIBNET N-List consortia, organize books exhibition, OPAC and M-MOPAC to check availability of library resources, Suggestion box and timely response, Annual best Reader Award for students.

ADVANTAGES OF NAAC ACCREDITATION

1. Library will know its strengths, weaknesses, opportunities and threats.
2. Library function get smoothly
3. Library update with essential services
4. Library equipped with various information resources
5. It help developing ICT infrastructure in library
6. NAAC accreditation reports act as a roadmap for future planning and services
7. Encourage library staff providing better library services

WEAKNESSES OR THREATS

1. The whole burden will only have to meet new challenges for the Librarian.
2. Unavailability of trained staff
3. Users are not interested in special collaboration with the necessary formalities to maintain different entries
4. Without support of users and staff we can't implement the new technology in the library

CONCLUSION

The NAAC Guidelines will serve as information centres for the development of the college library. He has considered all the activities to improve the quality of the library service which will be reflected in the resulting education. It provides a way that the libraries should try to reach the destination. Usually library order is not considered as preference. But NAAC has given an important place in the establishment of the organization. The libraries will be given better attention as a resource centre and will hope to make favourable changes in the library in the future.

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EFFICIENT *AGROBACTERIUM*-MEDIATED TRANSFORMATION PROTOCOL FOR TOMATO (*SOLANUM LYCOPERSICUM)*

Bandewar S. T. and Pangrikar P. P.[1]
Department of Botany, Rajarshi Shahu College Pathri, Aurangabad (M. S.)
[1]Department of Botany, R. B. Attal College Georai, Dist. Beed (M. S.)
shashikantbandewar@yahoo.com

ABSTRACT
Agrobacterium mediated gene transformation method is considered as an effective method for transferring foreign genes into plants. Hence, this study was conducted to enhance foreign gene transformation efficiency of cultivars of tomato (Solanum lycopersicum) using Single colony Agrobacterium culture from freshly grown culture of LBA4404 containing T-rep gene construct in pCAMBIA 2301 was grown in 25 ml of Luria broth medium with appropriate antibiotics at 28^{0}C and 180 rpm for overnight. Infection was carried out in antibiotic free MS liquid medium and incubated for co-cultivation in dark for two days. Before the infection overnight grown Agrobacterium culture was re-suspended in antibiotic free Luria broth medium and allowed to grow to the log phase. Explants were then transferred to selection medium (MS salts and B5 vitamins, 3% Sucrose, 1mg/l Zeatin, 0.1mg/l IAA, 80mg/l kanamycin, 300mg/l cephotaxime pH 5.8). After 28 days of incubation at 25+2^{o}C in 16 hr photoperiod condition, explants responded with callus induction were transferred to fresh selection medium. The response of the callus induction on kanamycin selection was more or less similar in all sets of experiments . Most of the survived calluses on second selection medium were observed with shoot induction.

Keywords: *Agrobacterium, Cotyledons, kanamycin, Tomato,Transformation etc.*

INTRODUCTION
Tomato is one of the popular vegetables in India. Yield and the quality of tomato are affected by many factors including pest and diseases, unfavorable weather conditions and post-harvest handling. The crop is highly subjected to post harvest losses during storage and transportation. Therefore crop improvement activities have been mainly directed towards the development of varieties with high yield, pest and disease tolerance and resistance to long term storage.Investigations on use of biotechnology for the improvement of Tomato have been carried out extensively in recent years. Gene-transformation is considered as the only method used to introduce genes with favorable characters. One of the most effective means of gene transfer into dicotyledonous plants has been reported as the *Agrobacterium tumefaciens* mediated transformation. It is well known fact that genes located within the border sequence of the *Agrobacterium* Ti plasmid are inserted into the genome of the host by random integration. Utilization of this mechanism for gene transfer requires both, susceptibility to infection by *Agrobacterium* and the ability to regenerate plants from individually transformed cells via tissue culture. A number of factors contribute to the overall efficiency of the *Agrobacterium* gene transformation. Up to now, the researchers have studied some factors affecting *Agrobacterium*-mediated transformation efficiency such as cocultivation duration, plant genotype, stage of explants, role of phenolic compounds, vector construct, *Agrobacterium* strain, bacterial density, infection temperature, and medium composition .Although a dicotyledonous plant secretes phenolic compound by itself, the addition of acetosyringone is found to be critical for stimulation of virulence gene action. This paper describes a successful approach to obtain regeneration of tomato plants from cotyledon explants and transformation of tomato by *Agrobacterium tumefaciens* method.

Agrobacterium mediated genetic transformation in tomato
Agrobacterium cells containing construct; pCAMBIA2301 with T-*rep* antisense gene along with NPTII gene as selectable marker gene (for antibiotic kanamycin as plant selection marker) &GUS gene as scorable marker gene was used for transformation of Tomato (var. TomD4) using protocol of McCormick (1991) with some modifications. Single colony *Agrobacterium tumefaciens* LBA4404 transformed with pCAMBIA2301 construct was grown in Luria broth liquid medium with rifamphicillin (25 µg/ml) and kanamycin (50 µg/ml) at 28°C for 18 hrs. With constant agitation at 180 rpm. 25ml of well grown culture was centrifuged at 4000 rpm at 4^{0}C for 5 min. pellet was then re-suspended in 25 ml of Luria broth medium without any antibiotic, with acetosyringone at the concentration of 200 uM. Culture was again incubated at 28°C for 18 hrs. With constant agitation at 180 rpm. till the OD reaches to ~ 0.8 (at $_{600\ nm}$). Finally before infection to the leaf explants the culture was diluted to 1:1 ratio using Murashige & Skoog liquid medium with 1% sucrose pH 5.8 before autoclaving.

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Healthy seeds were sterilized with 0.1% HgCl2 for 2 minutes, followed by sterile distilled water wash for 6-7 times and placed on germination medium (1/2 MS medium) after blot drying on sterilized blotting paper. Seedlings were developed in 16 hr photoperiod at 25+ 2^{o}C for one week after initial incubation in dark for 2-3 days. Cotyledonary leaves each were excised from 10 days old seedlings and explants were prepared by cutting all the sides of cotyledonary leaves. Placed the prepared leaf explants of size ~ 0.5 cm2 in adaxial position on the pre-culture medium (MS salts and B5 vitamins, 3% Sucrose, 1mg/l Zeatin, 0.1mg/l IAA, phytoagar 0.25 %, pH 5.8 adjusted before autoclaving). Cultures were incubated at 25+2^{o}C in 16 hr photoperiod for two days before infection.

Infection was carried out in sterile glass beaker, two day pre-cultured leaf explants were removed for tissue culture medium safely without keeping any traces of phytoagar before infection. 50 leaf explants at a time were infected with the *Agrobacterium* culture prepared as described above. Cultures were left for 20 minutes for Agroinfection in dark with gentle shaking. Excess *Agobacterium* culture was removed. These co-cultivated explants were blot dried on sterile filter paper and then placed on co-cultivation medium (MS salts and B5 vitamins, 3% Sucrose, 1mg/l Zeatin, 0.1mg/l IAA, phytoagar 0.25 %, pH 5.8 adjusted before autoclaving). Incubated the cultures in dark for 2 days at 25 ^{0}C.

The cotyledonary leaves were then transferred to (MS salts and B5 vitamins, 3% Sucrose, 1mg/l Zeatin, 0.1mg/l IAA, phytoagar 0.25 %, pH 5.8 adjusted before autoclaving) 80mg/l kanamycin, 300mg/l cephotaxime was added to autoclaved medium and poured in sterilized glass plate. The cultures were incubated at 25°C under 16 hr photoperiod for 3 to 4 weeks, with sub culturing at every 15-20 days. Young shoots were then transferred to MS medium containing 3% sucrose, 0.1 mg/l Zeatin, 0.1 mg/l IAA and kanamycin at 50 mg/l for shoot elongation. The shoots so obtained were transferred to MS medium with 0.05 mg/ml of IBA for rooting. Cultures were incubated for 2 to 3 weeks and rooted plants were transferred to pots containing peat and hardened. Hardened plants were shifted gradually to green house for further establishment and analysis. The observations on plant regeneration after co-cultivation were recorded. The seedlings were transplanted and maintained in greenhouse for further analysis along with a set of control plants.

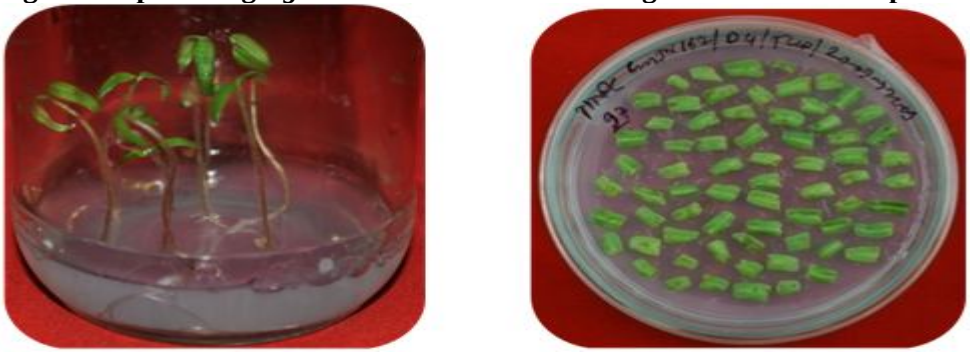
RESULTS AND DISCUSSION

Table: Transgenic Tomato development summary

Experiment	No. of explants infected	Percent of explants responded on selection	Percent of callus induced shoots	No. of plantlets developed
Set 1	156	48	28	11
Set 2	151	42	33	8
Set 3	145	46	40	13
Set 4	147	40	35	17
Set 5	155	51	35	10
Set 6	150	39	32	7

Regenerated shoots from callus were harvested & transferred to selection free elongation medium (MS salts with B5 vitamins, 3% Sucrose and 300mg/l cephotaxime. pH 5.8). Well developed shoots transferred to half-strength MS medium with 300mg/l Cephotaxime pH 5.8 for rooting. After 15 days root initiation started & seventy three rooted plantlets transferred to primary hardening and kept in controlled condition green house with high humidity (< 90%). Well established plantelts were then transferred to soil in contained polyhouse as per DBT norms. Plantlets were grown till maturity and seeds were collected from self pollinated fruits. Leaf sample from these primary transformants were collected for histochemical GUS assay, genomic DNA isolation for PCR analysis to confirm the gene integration prior to maturity.

Figure: Steps during *Agrobacterium* mediated transgenic tomato development



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a. Seedling development

b. Co-cultivation of cotyledonary leaf

c. Shoot induction on selection

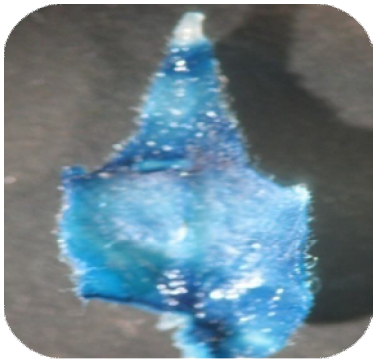
d. Rooted shoots & albino shoot

e. Plantlets ready to harden

f. Hardening of plants

Histochemical GUS assay

Gene construct T-*rep* used in this study to develop transgenic tomato was cloned in pCAMBIA 2301 which has GUS reporter gene along with selection marker nptII gene. During transformation experiments kanamycin antibiotic was used as selectable marker and GUS as reporter gene to check the gene expression at different stages of transformation in laboratory. To confirm the expression of inserted gene in primary transgenic tomato plant was carried out using the leaf pieces of the well established plants from contained polyhouse. Among the plants tested thirty plants were showing prominent GUS expression, control check was used from non transgenic leaf tissue from the tomato seedling which was positive control in transformation experiments. These GUS expressing plants were further used to confirm the gene integration by polymerase chain reaction (PCR).



Transgenic leaf expressing GUS gene

Non transgenic control

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CONCLUSION

Tomato was successfully transformed & regenerated using cotyledon explants cultured on MS salts and B5 vitamins, 3% Sucrose, 1mg/l Zeatin, 0.1mg/l IAA, phytoagar 0.25 %, pH 5.8 and this has been proved by GUS histochemical assay hence this protocol can be utilized for transferring gene of interest to Tomato system.

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RADAR REFLECTIVITY IN SOIL

Gaikwad P. D.
Department of Physics, R. B. Attal College, Georai, Dist. Beed (M. S.)
Pdgaikwad11@gmail.com

ABSTRACT
Radar is an active remote sensing system to detect objects and determine their range (or position) by transmitting short bursts of microwaves. , microwaves can penetrate light rain, clouds and be used to detect sea ice during the day and night and regardless of cloud cover in present paper is to understand the radar signal of reflectivity in soil.

Keywords: *Radar, microwave, sensor etc*

INTRODUCTION

RADAR stands for Radio Detection And Ranging. Radar systems are basically 38 categorized into three classes: imaging radars, scatter meters, and altimeters are used for monitoring. [1] RADAR systems are active sensors which provide their own source of electromagnetic energy by recording the range and magnitude of the energy reflected from all targets as the system passes by, a two-dimensional image of the surface can be produced. The microwave region of the spectrum is quite large, relative to the visible and infrared, and there are several wavelength bands. K bands: X-band C-band: S-band: L-band: P-band. **[2-5].**

METHODS

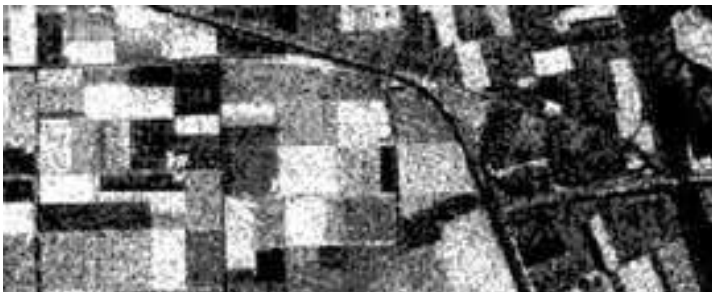
There are three approaches, which are generally applied for the determination of the soil moisture. These are point measurements, soil-water models and remote sensing.

IMAGE ANALYSIS

Analysis of remote sensing imagery involves the identification of various targets in an image, and those targets may be environmental or artificial features which consist of points, lines, or areas.[6]. Forestry, agriculture and land cover, since water is a vital component in each of these disciplines Techniques.

RESULT AND DISCUSSION

C-band



L-band

Figure-1: Two radar images of the same agricultural fields

Here are two radar images of the same agricultural fields, each image having been collected using a different radar band. As shown in figure 1.The one on the top was acquired by C-band radar and the one below was acquired by L-band radar. You can clearly see that there are significant differences between the way the various fields and crops appear in each of the two images crops depending on the radar wavelength. The L band has a longer wavelength and is more penetrating than the C band. Due to longer wavelength surface will appear dark with same surface due to increased backscattering surface will appear bright in radar images.

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CONCLUSION

Different radar bands having same agricultural fields has low radar reflectivity

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POLITICAL THOUGHTS OF JAWAHARLAL NEHRU

Satale S. N.
Department of Political Science, R. B. Attal College, Georai, Dist. Beed (M. S.)
satalesn9969@gmail.com

ABSTRACT
A pivotal figure during the Indian independence movement and patriarch of the country's most influential political family, Jawaharlal Nehru served as the first prime minister of the republic of India for nearly 20 year until his death on 27 may 1964. Amongst his many achievements, he passionately worked for women's right was an eminent writer, scholar and historian, almost single handedly revolutionized India's fledging education, social welfare economic system.

Keywords: *Socialist, education, poverty Redistribution of land, aqriculrire, democracy, secularism.*

INTRODUCTION

Pandit Jawaharlal Nehru dominated the Indian political science for about helf a century. Together with Gandhiji, he fought and struggled hard for the freedom of India. In fact, he remained the Prime Minister of his country for 17 years till his death. During this period, he raised India to an important position among nations of the world. It was sincere work for peaceful coexistence and faith in democratic socialism which made him popular not only in India but throughout the world. Perhaps this is the reason that he is called by Loard Boyd Orr as the ablest and most highly respected leader among what should rightly be termed as he free nations … Stalin called him ' the Man of Peace' Even Chou-En-Lai called him as 'A great gentleman'.

HER VIEWS ABOUT INTERNATIONALISM:

Nehru was a great internationalist. He was a great spokesman of Asian and African aspirations for complete freedom. He was an exponent of Panchsheel. In June 1954, the fundamental concepts of Panchasheel were laid down in the course of a joint declaration by Nehru and Chou-En-Lai. They are :

I) Mutual respect for each other's territorial integrity and sovereighty;

II) Non-aggression ;

III) Non-interference in each other's internal affairs;

IV) Equality and mutual advantage and

V) Peaceful coexistence and economic cooperation.

Nehru said, " I have no doubt that these principles of international behavior, if accepted and acted upon by all countries of the world, would go a long way to put an end to the fears and apprehensions which cast dark shadows over the world." Nehru was in favour of one world federation. He said that world government must and will come, for there is no remedy for the world's sickness. The machinery for it is difficult to devise. It can be an extension of the federal principle, a growth of the idea underlying the United Nations, giving each national unit freedom to fashion its destiny according to its genius, but subject always to the basic covenant of the world Government. Nehru held that we have arrived at a stage in human affairs when the ideal of the one world and kind of world federation seems to be essential though there are many dangers and obstacles in the way … We, therefore, United Nations structure which is painfully emerging from its infancy.

HIS VIEWS ON NON-ALIGNMENT

Nehru was a firm believer in the policy of non-alignment. On October 17, 1949 during the course of his speech at Columbia University he said, " I am asked frequently way India does not align herself with a particular nation or a group of nations and told that because we have refrained from doing so, we are involved in it deeply to regard calm objectivity in others irrational, short sighted, negative, unreal or even unmanly. But I should like to make it clear that the policy Indian has sought to pursue is not a negative and neutral policy. It is positive and vital policy that flows from our struggle for freedom and from the teachings of Mahatma Gandhi.

Nehru held that India should as far as possible keep away from the power politics of groups, aligned against one another which have led in the past to world wars and which may again lead to disasters on an even vaster scale. The world, in spite of its rivalries and hatreds and inner conflicts, moves inevitably towards closer co-operation and the building up of a world commonwealth. It is for this One World that free India will work.

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NEHRU A SOCIALIST

Fabians want Socialistic governance but they want to establish socialistic governance through democratic means. Nehru set up Planning Commission in 1950. Nehru presided over the planning commission as its ex officio chairman and took control over India's Planning process. He introduced Mahalnobis Model (1) of planning. This model was based on starting heavy industries first with expectation that in the natural course the ancillary and small industries will come up in private sector. This model was also called as Mixed Economy. It meant existence of Public Sector and Private Sector side by side. Prof. Ludwig Von Mises of Austria and. Prof. P.R.Brahmanand of Bombay University were against Mixed Economy. They thougth such an arrangement is ridiculous and cannot work. Indian version of state planning and control over the economy miserably failed. In the First Five Year Plan emphasis was on agriculture and irrigation and in the Second Five Year Plan emphasis was on Industrial development in Public Sector. In Faizpur Session of Congress in the year 1963 (December) Nehru spoke about problems of poverty and unemployment in India. He showed concern about the toiling masses reeling under abject poverty.

REDISTRIBUTION OF LAND

Under Jawahar Lal Nehru's leadership the Planning Commission advised all state governments in India to table land reform bills in legislative assemblies and pass those bills to make laws about abolition of Zamindari. All absentee landlords were made ordinary farmers. And of the tiller was the policy Nehru adopted. Millions of tillers got the rights over the lands. In some states the landlords tilted laws and moved petitions. The famous Golak Nath case was filed against the policy of abolition of Zamindari. In the second stage of socialist move, the planning commission suggested all state governments to pass laws bringing ceiling on land holdings. In the third stage tenancy laws were passed to give rights to tenant who tilled agricultural lands of big land owners. India being predominantly agricultural lands of big land owners. India being predominantly agricultural countries during nineteen sixties the laws made for land reforms gave big impetus to agriculture.

CONCLUSION

As a political thinker, Jawaharlal Nehru was a staunch democrat. He considered democracy to be the best form of government. He always found himself safe in a democracy in fact the Indian experiment in constitutional democracy shoes owes more to Nehru than to anyone else or to any combination of factors some westerners would do will to appreciate this aspect of Nehru's leadership. Nehru believed, like Thomas Jefferson, that democracy works successfully with people's goodwill and co-operation. It can't go against people and Nehru was so hopeful about its success in India that he remarked, "we will resist the imposition of any other concept here or any other practice." The true measure of Nehru's humanism, his tolerance and his liberalism is perhaps best revealed in the following extemporences reflection on 'what constitutes a good society and good life?'

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SPECTROPHOTOMETRIC ESTIMATION OF Fe (III) WITH 5-BROMO, 2-HYDROXY ACETOPHENONE COMPLEX BY JOBS METHOD

Ubale S. B.
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed (M. S.)
drsanjayubale@gmail.com

ABSTRACT
In the present investigation it was observed that the color of the complex was light pink .Therefore it was decided to study the spectrophotometric study of Fe (III) with 5-bromo, 2-hydroxy acetophenone in 50% (v/v) ethanol-water mixture solution. The energy of activation, the minimum and maximum absorbance, at two different pH values, and Thermodynamic K were determined.

Keywords: *spectroscopy, acetophenone, complex, absorbance etc.*

INTRODUCTION
Complexation Studies plays an important aspect in research .The research on it have received the attention of researchers .1-3 The extent of ligand with the metal ion by coordinate bonds is expressed as stability constants. It can be determined by different methods such as Polaragraphy, Spectrophotometric methods etc.

An attempt has been made to report the thermodynamic stability constant of Fe (III) with 5-bromo, 2-hydroxy acetophenone.

EXPERIMENTAL
SD Fine (AR grade) chemicals and reagents were used in this investigation. The measurement of absorbance was made by using Chemita, 215-D Spectrophotometer. It had an accuracy of + 0.01 it had an range 350nm to 700nm. The pH of solutions was measured on the Elico digital pH meter model (LI-120). The solutions were brought to a desired value of pH by the addition of HCl or NaOH as the case may be. To investigate the complex formation process between Fe (III) with 5-bromo, 2-hydroxy acetophenone, Jobs method of continuous variation as modified by Vosburgh and Gould (4) was adopted.

RESULT AND DISCUSSION
In the present investigation it was observed that the color of the complex was light pink. It changes as the pH of the solution goes on increasing. Therefore it was decided to do Spectrophotometric study of Fe(III) with 5-bromo,2-hydroxy acetophenone in 50% (v/v) ethanol-water mixture solution.

The spectroscopic data is represented in Table 1.

Table-1

Spectrophotometric data of Job's method of continuous variation

Fe (III) = 5-Bromo, 2 hydroxy acetophonone.

pH = 2.03 Color = Pink. λmax = 525 nm.

Solvent : Ethanol- Water mixture solution (50%)

Fe (III) = 5Br = 1 X $10^{-2}\,M.$

Fe (III)solution (ml)	$5-Br$ solution	O.D. (absorbance)
1	9	0.200
2	8	.208
3	7	0.370
4	6	0.409
5	5	0.424
6	4	0.408
7	3	0.353
8	2	0.271
9	1	0.259

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An attempt was made to know the minimum and maximum absorbance of the ligand viz. 5-bromo, 2-hydroxy acetophenone which are found to be **220** and **338.5** respectively.

It was convenient to report thermodynamic K, as represented in Table1, which are on the lines of Jahagirdar (5).

Table-2: Values of λmax, Kc, pKth, Kth

Name of the ligand	λmax	pKth	Kc	Kth
5-bromo, 2-hydroxy acetophenone	525	10.50	2.62	8.88

Similarly the value of energy of transition ($\triangle$ E) was determined. The value of 2-hydroxy acetophenone was considered as Eo **(2.7283**) obtained from literature (6) and that of 5-bromo, 2-hydroxy acetophenone as E1, thus value of $\triangle$ E was determined.

The values of λmax were determined at two different pH values one ranging from pH =2.00 to 3.00 and second pH =3.00 to 4.00. therefore the values of delta E were expressed as delta E1 and delta E2.

The values of them are listed in Table 3 .

Table-3: Values of λ, E and $\triangle$ E1 of 1:1 Fe (III) complex:

Fe (III) complex with 5-bromo, 2-hydroxy acetophenone	λmax nm	pH = 2 -3 E X 10^{-8}eV	$\triangle$ E1	λmax	pH = 3-3.5 X 10^{-8}eV	$\triangle$ E2
5 –Br	525	2.7201	10	495	2.6946	30

Thus in the present an attempt was made to report the above values, as references of the said work is not available.

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A STUDY ON MAJOR PROBLEMS AND ITS SOLUTION WITH RURAL DEVELOPMENT IN MAHARASHTRA

Waykar V. B
Department of Commerce, R. B. Attal College, Georai, Dist. Beed (M. S.)
vvvivekwaykar7@gmail.com

ABSTRACT
The rural development is the major issues in the current century in India. The rural sector is important for the society because it generate growth and development of the civilization to sustain and achieve human goal for better existence. Economic growth and rural society is connected, because most of the resources available for development come from rural societies.

Rural development is the backbone for any country's socio-economic development and it helps the economy to growth and sustain. The rural people are facing the problems of undulation poverty. If the rural sector educated and advanced, it is easy to do business and high development. It is necessary to the government to move the direction rhythm with the society because their sustainability is depend on the long term benefit from the social, economical and rural development issues connected to the rural basis.

Keywords: Rural development, Infrastructure development, various facilities, economic growth, basic facilities, socio-economic development.

INTRODUCTION

The rural society of Maharashtra is very much backward. Its backwardness is very much due to the several problems that haunt the rural society. Rural development of any country is largely based on the role of the government toward rural development planning and policies. The present situation is the process of the changes is very slow and so the problems are more in recent years. The process of changes has been accelerated and so new problems are also cropping up.

The major rural problems are consisting of the agricultural and economic. The division of land, lack of cottage industries, social evils, lack of educations, death of animals, migration, unemployment, poverty and so on. These problems are the results of traditional and conservation of the rural society. Near about 70% population of India living in the rural sector that's why without development of rural sector we can't achievement of aim of overall success. Without involving rural sector in Indian economy India should not follow the path which brings the India at level of development country.

Rural development is the topic which is well easy to understand but very hard in implement. It focuses upon the upliftment and development of the section of rural economies, that experience grave poverty issues and effectively aims at developing their productivity. Some areas that need urgent attention for rural development in Maharashtra are:-

1) Public health center 2)Education 3)Female empowerment 4) Rural road facility 5) Electricity facility 6) Employment opportunity.

OBJECTIVES OF THE STUDY

1) To study the major issues of rural development in Maharashtra.

2) To study the strategy of rural development in Maharashtra.

3) To study the indicators of rural development in Maharashtra.

RESEARCH METHODOLOGY

The present research study is based on secondary data sources. Secondary data is collected from the various rural development books, journals, news paper, magazine, web sites and etc.

MAJOR PROBLEMS AND ISSUES IN THE RURAL DEVELOPMENT SECTOR

1) **Uncontrolled migration:** Maharashtra is the highest migration from other states of India, because of employment opportunities, good schools and colleges, easy of living and better living facilities. Most of rural families migrate toward urban areas. For searching employment because in rural area have not available good employment opportunities, that why rural poor cannot get their basic daily needs in their rural areas.

2) **Lack of awareness: -** Apart from the government rural development schemes have been advertise in such a level. Many well intended and well targeted schemes and programs die because of lack of awareness.

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3) **No self governance: -** The best way of governance. But rural people are hardly aware of activities that take place in panchayat raj institution. The gram sabha and meeting are done merely for the sake of formality and hardly aver people are involved in the decision making.

4) **Division of land: -** Sub division of land and pregmention of holding is one of the main causes of our low agricultural income and backward state of our agricultural. A lot of time and labor is wasted in moving seeds, manure and implement from one piece of land to another.

5) **Poor health facilities:-**A serious drawback of India health service is the neglect of rural masses. It is a largely a service based on urban hospitals. Although there are large numbers of hospitals and primary health centers yet the urban bias is visible. According to the health information 31.5 % of hospitals and 16 % hospitals beds are situate in rural areas where 75 % of total population resides.

6) **Unemployment: -** Maharashtra has roughly 70 % of his population living in the rural areas; agricultural is the main stay of the rural population. But no rural employment is available for all these living in rural areas, most of rural people are migrate toward urban areas for searching employment.

7) **Poor infrastructure: -** Basic infrastructure facilities are very poor in rural areas in Maharashtra. Like safe drinking water. Rural roads, electricity facility, primary health services, education and etc. It is a major problem in facing rural people in their areas.

MAJOR SOLUTIONS REGARDING RURAL DEVELOPMENT

1) Provide social infrastructure: - Rural people they need to have basic infrastructure like electricity, water facility, rural road and so on, tha5ts they are free from the cycle of drought and floods. Electricity, road connectivity and drinking water facility should be providing for rural sector. Social infrastructure is concern with the supply of such services at meet the basic needs of society, like, health service, drinking water facility, sewerage, sanitation, electricity, education facility and etc.

2) Provide self employment:- Government need to give rural people self employment opportunities so that they want to stay In their own village instead of migration in cities. Government must provide employment schemes to the rural poor and unemployed rural people

3) Active participation: - Rural peoples active participation is most important in the rural development process. Direct participation during the time of meeting in gram sabha, other rural meeting people must attend for their active participation at the time of rural development planning at village level. peoples active participation also important in governments various schemes toward rural development.

4) Agricultural growth: - The main occupation of Indian is agricultural and its allied activities like farming, cattle, poultry and animal husbandry. Also Indian economy is one of world oldest agrarian economy. According to the recent statistics 65 to 70 percent labor force in India is engaged in agricultural. They are producing about 22 percent of country's GDP that's why country's agricultural development is very important.

5) Development of socio-Economic infrastructure: - In order to maintain smooth functioning between agriculture and rural sector a well organized socio-economic infrastructure is necessary. Thus government is investing huge amount money for the development of overhead of capital, like, energy, transports, communication, education, health, housing, etc.

MAJOR CONCLUSIONS

As we show the problems we should carry out some essential steps. The migration of rural poor's toward urban areas should be stopped. Government need to provide proper employment to the rural people that are why rural people migration will be stop. Government's role is important in stop migration. Government should provide more assistance to the self employed people by providing financially, raw material, machineries and technical awareness. It should also emphasis on vocational training. More and more employment sources should be providing in rural areas for the seasonal unemployed people. Basic infrastructure facilities should be improved. It provides key to modern technology in practically all sectors. Government should develop and provide rural development based infrastructure facilities to the villages.

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SOLUTION OF FORCED AND FREE CONVECTION FLOW OF DISSIPATIVE FLUID PAST AN INFINITE VERTICAL PLATE

V. Kulkarni and V. P. Sangale[1]
Department of Mathematics, SWA. Sawarkar Mahavidyalaya Beed
[1]Department of Mathematics, R. B. Attal College Georai, Beed
vijaysangale67@gmail.com

ABSTRACT
An approximate solution of forced and free convection flow of dissipative fluid past an infinite vertical Plate, is derived by explicit finite difference technique by taking into account viscous dissipative heat. It is observed that the velocity decreases near the plate and the increases far away from the plate. Greater Viscous dissipative heat causes a rise in the velocity but the velocity decreases with increasing the Prandtl number for large t. An increase in G or t also increases in the skin friction but the rate of heat transfer decreases.

***Keywords**: Viscous dissipative heat, Prandtl number , Grashof number , Skin friction.*

INTRODUCTION

Siegel (1958)] schetz and Eichhorn (1962) Menold and Yang (1962) Chung and Anderson (1961),Goldstein and Briggs (1964) and Sugawara and Michiyoshi (1951) Soundalgekar ,Lahurikar and Pohnerkar (1997) studied the unsteady free convection flow under various conditions past an infinite vertical plate. Goldstein and Eckert (1960), confirmed experimentally some of these theoretical predictions. In all these studies, the infinite plate was assumed to be stationary and the fluid was suppose to move due to temperature difference only. If the fluid is stationary and the infinite plate surrounded by stationary fluid is given an impulsive motion along with its temperature raised to such that, where is the temperature of the surrounding fluid how the shape of fluid flowing takes its shape? This was studied by Soundalgekar (1977) in case of an isothermal plate. The effect of free convection currents on the flow and the skin friction were studied in this paper.

Combined free and forced convection flow past a semi-infinite vertical plate was first studied by Acrivos (1958),Kliegel (1959)who solved the equations by using the Karman- Pohlhausen method.. However another physical situation which is often experienced in the industrial application is the unsteady free and forced convective flow past an infinite vertical isothermal plate of an incompressible fluid. This situation studied by Jahagirdar and Lahurikar (1989) without considering the dissipative heat.

In some of these papers the effect of viscous dissipative heat was assumed to be neglected. Gebhart (1962) has studied and get the result that when the temperature difference is small or in high Prandtl number fluids or when the gravitational field is of high intensity, viscous dissipative heat should be taken into account in steady free convection flow past a semi-infinite vertical plate. Following this assumption Soundalgekar, Bhat and Mohiuddin (1979) studied the effect of free convection currents on the flow past impulsively started infinite plate, in this case the problem is governed by a coupled non-linear system of partial differential equations This problem was solved by finite difference technique.

It has been proposed to study forced and free convection flow of dissipative fluid past an infinite vertical Plate. As the problem is governed by coupled nonlinear system of partial difference equations exact solutions are not possible, so we employ explicit finite difference method.

MATHEMATICAL ANALYSIS :

Here we consider the unsteady free and forced convection flow of a viscous incompressible fluid past an infinite vertical isothermal plate in the upward direction in presence of dissipative heat. The -axis is taken along the plate in the vertically upward direction and the - axis taken normal to the plate. Initially at both the plate and the fluid are stationary and at the same temperature At tim.e the plate temperature is raised to and the fluid starts moving upward with velocity $U_{0.}$ Then the difference between the plate temperature and the ambient temperature causes the free convection currents to flow near the plate modifying the fluid flow. The physical variables are functions of and only. Then under usual Bonssinesq's approximation,by the following system of coupled partial differential equation in non dimensional form

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$$\frac{\partial u}{\partial t} = G\theta + \frac{\partial^2 u}{\partial y^2} \qquad (1)$$

$$Pr\frac{\partial \theta}{\partial t} = \frac{\partial^2 \theta}{\partial y^2} + \Pr E\left(\frac{\partial u}{\partial y}\right)^2 \qquad (2)$$

with following initial and boundary conditions.

$$u = 0, \quad \theta = 0 \quad for\ all\ y, t \le 0$$

$$u = 0, \quad \theta = 1 \quad at\ y = 0 \quad t > 0$$

$$u = 1 \quad \theta = 0 \quad as \quad y \to \infty, \quad t > 0 \qquad (3)$$

On introducing following non dimensional quantities

$$U = \frac{u'}{U_0} \qquad t = \frac{t'{U_0}^2}{\nu}, \qquad y = \frac{y'U_0}{\nu}, \qquad Pr = \frac{\mu Cp}{k}$$

$$G = \frac{\nu g\beta(T'w - T'\infty)}{{U_0}^3}, \theta = \frac{T' - T'\infty}{T'w - T'\infty,}, \quad E = \frac{{U_0}^2}{Cp(T'_w - T'_\infty)} \qquad (4)$$

Here G is the Grashof number Pr is the Prandtl number and E is the Eckert number. These are coupled non-linear equations, which have no exact solution or approximate solution. Hence we solve it by explicit finite difference method. These equations reduce the following form.

$$\frac{u_{i,j+1} - u_{ij}}{\Delta t} = G\theta_{ij} + \frac{u_{i+1,j} - u_{i,j} + u_{i-1,j}}{(\Delta y)^2} \qquad (5)$$

$$Pr\frac{\theta_{i,j+1} - \theta_{i,j}}{\Delta t} = \frac{\theta_{i+1,j} - 2\theta_{i,j} + \theta_{i-1,j}}{(\Delta y)^2} + \left(\frac{u_{i+1,j} - u_{ij}}{\Delta y}\right)^2 \qquad (6)$$

With following initial and boundary conditions in finite difference form

$$u(i,0) = 0, \quad \theta(i,0) = 0 \quad for\ all\ i\ except\ \ i = 0$$

$$u(0,0) = 0, \quad \theta(0,0) = 1$$

$$u(0,j) = 0, \quad \theta(0,j) = 1 \quad for\ all\ j$$

$$u(35,j) = 1, \quad \theta(35,j) = 0 \quad y \to \infty = 35 \qquad (7)$$

Here i correspond to y and j corresponds to t. Here infinity is taken as y=3.5 because from the exact solution of equations (1) & (2) and for E=0 it has been observed that u and tends to 1 and zero around y= 3.5 for all value of Pr. velocities and temperatures is computed from equation (5) to (7) The procedure is repeated till t=1 i.e.,j=400 During computation was chosen as 0.00125. These conditions were carried for Pr=0.71, 7 and E=0.1,0.2 and 0.4. To judge the accuracy of the convergence and stability of the finite difference scheme, the same program was run with smaller values of t i.e.t =0.0009 and 0.001 and no significant change was observed. Hence we conclude that the finite difference scheme is stable and convergent.

We calculate the skin-friction and rate of heat transfer defined by following non dimensional quantities by using the five point Newton Coates formula and entered in the table.

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$$\tau = \left(\frac{\tau'}{\rho U_0{}^2}\right) = \left(\frac{-du}{dy}\right)_{y=0}$$

$$q = \left(\frac{vq'}{kU_0\Delta T}\right) = -\left(\frac{d\theta}{dy}\right)_{y=0} \qquad (8)$$

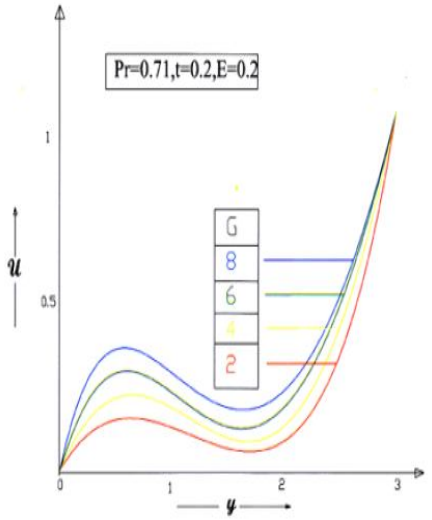

Fig.1. Velocity profile

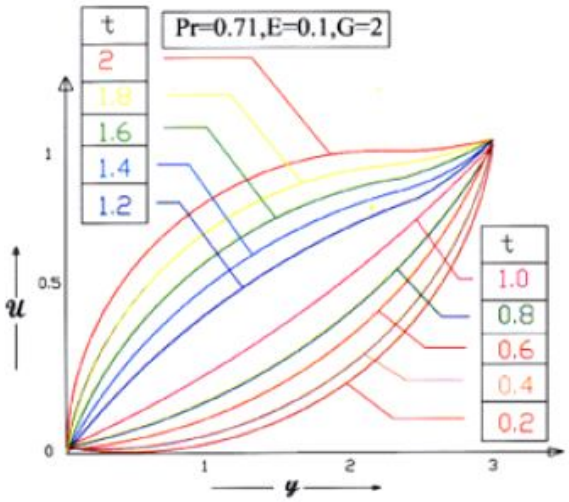

Fig. 2. Velocity profile

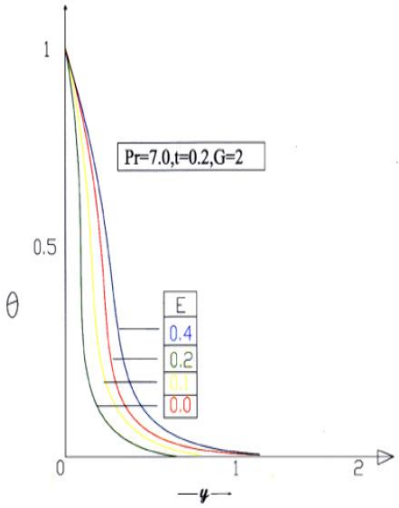

Fig-3: Temperature profile

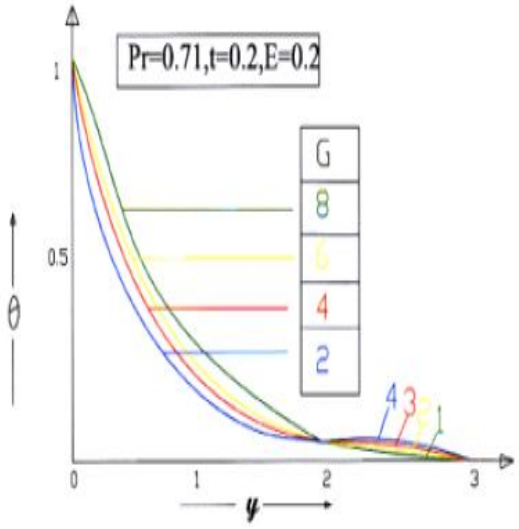

Fig-4: Temperature profile

t	E	G	Pr= 0.71		Pr= 7	
			-τ	-q	-τ	-q
0.2	0.0	2	0.548661	1.057851	0.275831	3.343185
	0.1	2	0.548696	1.056722	0.275836	3.342900
	0.4		0.548801	1.053334	0.275851	3.342067
0.2	0.2	4	1.097791	1.049022	0.551706	3.340955
		6	1.647578	1.038052	0.827688	3.338174
0.4	0.1	2	0.782358	0.744987	0.397351	2.355254
0.6			0.986162	0.601883	0.513918	1.919075

TABLE (I)

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RESULT AND CONCLUSIONS

From fig (1) to (4) and Table (I) it is observed that

1. Greater Viscous dissipative heat causes a rise in the velocity but the velocity decreases with increasing the Prandtl number for large t. When Prandtl number increases the flow is unstable for small t.
2. The Grash of number increases the velocity also increases and flow become unstable.
3. An increase in t leads to an increase in the velocity.
4. Greater viscous dissipative heat causes a rise in the skin -friction but an increase in Pr leads to a decrease in the skin-friction. An increase in G or t also increases in the skin -friction.
5. The rate of heat transfer is found to decrease with increasing G,E or t.
6. Greater viscous dissipative heat causes a rise in the skin friction but an increase in Pr leads to a decrease in the skin-friction.
7. Increase in the Grash of number G or in t, skin -friction also increases.

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- **Multiple author journal article:**

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- **Text Book:**

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Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

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