International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue X Oct 2021- Available at www.ijraset.com

Performance of Oil Fired Steam Boiler (100 Kg / Hr)

Sandip D Patil[1], Rahul M Pawar[2], Ganesh R Sharma[3]
[1]*PG Scholar, Rajarambapu College of Sugar Technology And Project Co coordinator Datacone Engineers Sangli Maharashtra*
[2]*HOD Sugar Technology Department, Rajarambapu College of Sugar Technology Islampur Dist Sangli Maharashtra*
[3] *Project Engineer Datacone Engineers Sangli Maharashtra*

Abstract: Steam boiler or simply a boiler is basically a closed vessel into which water is heated until the water is converted into steam at required pressure. To study the performance, Graphs are to be plotted for Pressure , Temperature , Boiler Efficiency, Equivalent Evaporation.
Keywords: Dryness Fraction, Pressure, Boiler Efficiency, Equivalent Evaporation , Separating And Throttling, Condenser Efficiency.

I. INTRODUCTION

The basic working principle of boiler is very simple and easy to understand. The boiler is essentially a closed vessel inside which water is stored. Fuel is bunt and hot gasses are produced. These hot gasses come in contact with water vessel where the heat of these hot gases transfer to the water and consequently steam is produced in the boiler . Boiler efficiency depends upon the size of boiler used . Actually there are some losses occur like incomplete combustion, radiating loss occurs from steam boiler surrounding wall, defective combustion gas etc. In water tube boiler the water is heated inside tubes and hot gasses surround these tubes. In sugar industries mostly water tube boiler is used.

To study the performance, Graphs are to be plotted for Pressure variation , Temperature variation , Boiler Efficiency , Equivalent Evaporation

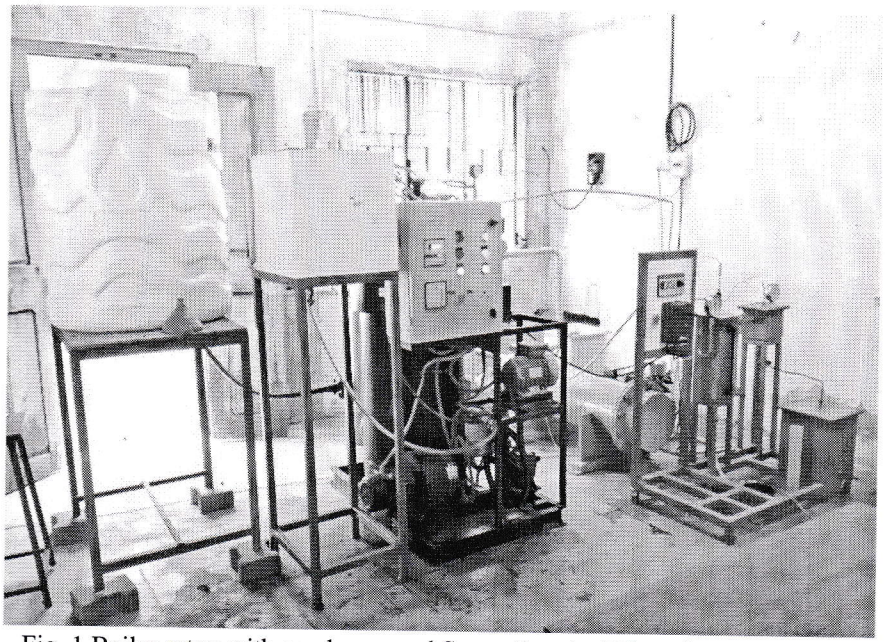

Fig. 1 Boiler setup with condenser and Separating And Throttling Calorimeter

II. EXPERIMENTAL SETUP

The experimental setup consist of oil fired Non IBR Boiler of 100 Kg/Hr Capacity with economizer.To measure the dryness fraction of steam separating throttling calorimeter is provided . Shell and tube type condenser with reciprocating type vaccum pump.The whole setup is mounted on a self-contained sturdy iron Frame

I J R B A T, Issue (VII), Vol. II, May 2019: 11-14
A Double Blind Peer Reviewed Journal
OPEN ACCESS
e-ISSN 2347 – 517X
Original Article

INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY

www.ijrbat.in

BASIC CONTOUR TRANSFORMED DENSITIES

A .N. Basugade
Professor and Head, Department of Statistics
Gopal Krishna Gokhale College, Kolhapur, (MS) INDIA 4160012
arunb1961@gmail.com

Communicated : 11.03.19
Revision : 10.04.19
Accepted : 25.04.19
Published: 30.05.19

ABSTRACT:

A New class of distributions can be generated by using a distribution or class of distributions. Some well-known methods to generate a class of distributions are transformation of variables, use of conditional distributions, introducing of additional parameters or the use of Copulas. Here we introduce *Contour-Transformation*; a technique based on geometric approach and use it to generate new classes of distributions. In this artical we generate densities based on the size of contours of a density function.

Key words: -*Basic Contour Transformation, Unimodal, Symmetric.*

INTRODUCTION:

Most of the times a proposed well-known statistical model may not give a very satisfactory fit for a collected data set. In such situations one has to make certain modifications in the model and suitable model has to be proposed. A New class of distributions can be generated by using a distribution or class of distributions. Some well-known methods to generate a class of distributions are transformation of variables, use of conditional distributions, introducing of additional parameters or the use of Copulas.

In the literature some methods to modify a model to give a better fit for the data set have been reported. In recent days there is a trend in the literature on parametric families of asymmetric distributions making a deviation from symmetry as well as the normality assumptions. Many researchers have developed different methods to construct skewed distributions. Azzalini (1985) introduced skew Gaussian distribution in terms of a product of density function and distribution function of normal distribution. Also if X and Y are symmetric and independent random variables with probability density functions f_X and f_Y and distribution functions F_X and F_Y, respectively, then for any λ, $g(y) = 2 f_Y(y) f_X(\lambda y)$ is a proper density function. This leads to a skew-normal distribution by considering X and Y to be independent and identically distributed standard normal variables. The epsilon-skew normal density proposed by Mudholkar and Hutson (2000) gives better fit for data sets of heights of 219 volcanoes. Arnold, et al. (2002) have obtained a general family of multivariate densities with given contours and these include circular and elliptical densities not necessarily having the same center, but have not used transformation of the contours to generate densities. Rattihalli and Basugade (2008) have generated a class of multivariate densities by using contour transformation.

New families of distributions have also been introduced using the concepts of conditioning or truncation. When X has unbounded support, by conditioning on a bounded set, the natural parameter space can be enlarged yielding a new family of distributions. For further details one may refer to Rattihalli (2004).

In this article we develop models by considering transformation of contours of a probability density function (p.d.f.). Particularly we propose the densities based on Basic contour transformation.

2. Notations and Concepts:

Contour Transformation:Let f be a density function with modal value 0. For $0 \le u \le f(0)$ we consider a transformation of contour $C_f(u)$ to $C^*(u)$ such that

i) the class $\{C^*(u) : 0 \le u \le f(0)\}$ is non-increasing in u and (1)

ii) $\wedge (C_f(u)) = \wedge (C^*(u))$, $0 \le u \le f(0)$. (2)

where, $\wedge$ is the Lebesque measure on $\Re^k$. Note that corresponding to such a class $\mathbf{C}^* = \{C^*(u): 0 \le u \le f(0)\}$ there exists a function f^* (say) given by $f^*(x) = \sup\{u: x \in C^*(u)\}$ such that $C^*(u) = C_{f^*}(u)$, $0 \le u \le f(0)$. It

Importance and Statistical Analysis of Impact on Personality Traits of Co-curricular Activities

Dr. A. N. Basugade
Professor & Head, Department of Statistics,
Gopal Krishna Gokhale College, Kolhapur

Abstract:

Co-Curricular Activities is a very important and essential part of educational system. These are the activities through which a learner explores ones abilities, develops the strengths and eradicates the shortcoming through informal guidance, observation and self-assessment. The activities undertaken to strengthen the classroom learning as well as other activities both inside and outside the classroom to develop the personality of the student.

More emphasis has generally been given to the co-curricular Activities resulting from the student's inability to link the excellence in performance academically to the active participation in co-curricular Activities. In this paper we will discuss the need and importance of co-curricular activities in higher education.

Keywords - Co-curricular, Extracurricular, Student Development.

1. Introduction:

Co-curricular activities are those activities which fall outside the regular academic curriculum. They are also known as 'Extra-curricular' activities. Extra-curricular activities exist at all levels of education from pre-elementary to university stage of education. These activities are compulsory in some institutions while in others these are taken as voluntary. Co-curricular activities form the core of students' life.Participation in co-curricular activitiesis essential to developpeople with a strong sense of identity and a passion for learning who will become self-confident.

The all-round development of an individual is onlypossible through balanced development of academic as wellas non-academic aspects in the formal, in-formal andnon-formal educational setting in the society. Particularly, in the modernera where individual have to pass through phases of undue anxiety andover-stress and sometimes it leads to various types of depression. In such cases individual's involvement in theco-curricular activities become more significant because these activitiesstop stress of an individual.Today the burdens of marks, grades, divisionsetc. are also becoming fatal for growth and life of students across all the sections of education. The co-curricular or extracurricular activities helpthe student to overcome the stress and allow the holisticdevelopment of individual.

The modern education system recognizes that student come to educationalinstitution for all round development.It aims at the development of the total personality of the student andfor that college provides opportunities for experiences. In factthe quality of the college depends on and is evaluated uponthe education experiences which are provided in the collegestudy programmes, which may contribute to a long, happy and normal lifeto the student. This comprises curricular, extracurricular as well as co-curricular education which provides inside as well as outsidethe classroom. Modern education gives special emphasis on the need ofco-curricular and extracurricular activities, because it has beenrecognized as a source of enrichment of the college curriculum.Psychologically these activities are consideredessential to provide outlets for the flow of excess energies of the students.

2. Meaning Of Co-Curricular Activities:

Co-curricular Activities are non - academic activities that students participatein. They are a great means of enhancing social interaction, healthyrecreation, leadership, self - discipline and self - confidence.A few examples of common educational opportunities that may beconsidered as Co-curricular which includes musical performances, debate competitions, indoor andoutdoor sports, camps, visits etc. Co-curricular activities are known with different names or terms such as extracurricular activities, informalactivities, semi-curricular activities, non-curricular activities.Co-curricular and extracurricular activities act as valuable catalysts forcollege to create the sense of community. They providestudents opportunities to experience both i.e. independence andinterdependence. Participation in co-curricularactivities or extracurricular activities willreduce the dropout rates of students.

3. Need Of Co Curricular Activities:

Co-curricular Activities develops skills for Life and Career of students. Co-curricular and Extracurricular Activities offer a forum beyond the dailyclassroom experience for students to develop, practice

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Ecotoxicology and Environmental Safety

Volume 161, 15 October 2018, Pages 70-77

Asparagus densiflorus in a vertical subsurface flow phytoreactor for treatment of real textile effluent: A lab to land approach for *in situ* soil remediation

Anuprita D. Watharkar [a b 1], Suhas K. Kadam [a 1], Rahul V. Khandare [b], Parag D. Kolekar [c], Byong-Hun Jeon [d], Jyoti P. Jadhav [a c], Sanjay P. Govindwar [a d]

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https://doi.org/10.1016/j.ecoenv.2018.05.078

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Abstract

This study explores the potential of *Asparagus densiflorus* to treat disperse Rubin GFL (RGFL) dye and a real textile effluent in constructed vertical subsurface flow (VSbF) phytoreactor; its field cultivation for soil remediation offers a real green and economic way of environmental management. *A. densiflorus* decolorized RGFL (40 gm L^{-1}) up to 91% within 48 h. VSbF phytoreactor successfully reduced American dye manufacture institute (ADMI), BOD, COD, Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) of real textile effluent by 65%, 61%, 66%, 48% and 66%, respectively within 6 d. Oxidoreductive enzymes such as laccase (138%), lignin peroxidase (129%), riboflavin reductase (111%) were significantly expressed during RGFL degradation in *A. densiflorus* roots, while effluent transformation caused noteworthy induction of enzymes like, tyrosinase (205%), laccase (178%), veratryl oxidase (52%). Based on enzyme activities, UV–vis spectroscopy, FTIR and GC-MS results; RGFL was proposed to be transformed to 4-amino-3- methylphenyl (hydroxy) oxoammonium and N, N-diethyl aniline. Anatomical study of the advanced root tissue of *A. densiflorus* exhibited the progressive dye accumulation and removal during phytoremediation. HepG2 cell line and phytotoxicity study demonstrated reduced toxicity of biotransformed RGFL and treated effluent by *A. densiflorus*, respectively. On field remediation study revealed a noteworthy removal (67%) from polluted soil within 30 d.

Graphical abstract

ScienceDirect

Journal of Cleaner Production
Volume 190, 20 July 2018, Pages 411-421

Optimization of dilute acetic acid pretreatment of mixed fruit waste for increased methane production

Shouvik Saha [a], Byong-Hun Jeon [a], Mayur B. Kurade [a], Shekhar B. Jadhav [b], Pradip K. Chatterjee [c], Soon Woong Chang [d], Sanjay Prabhu Govindwar [a], Sun Joon Kim [a]

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https://doi.org/10.1016/j.jclepro.2018.04.193

Abstract

A proper waste management practice such as anaerobic digestion for the waste generated by the agro-food industries could minimize the amount of material disposal to landfill. In our study, the improvement of methane production was elucidated through the pretreatment optimization of the mixed fruit wastes (FW). Dilute acetic acid pretreatment of FW was optimized in order to increase the bioavailability and microbial accessibility. A maximum sugar recovery of 95% was achieved from the pretreated FW under the optimized conditions (0.2 M acetic acid, 62.5 °C, and 30 min). Fourier transform infrared spectroscopy (FTIR) and Thermogravimetric (TG) analyses verified the presence of cellulosic material in the pretreated FW. X-ray diffraction (XRD) analysis indicated that the crystallinity index was increased to 56% after the disruption of complex hemicellulosic structures during pretreatment. Increased porosity and surface roughness of pretreated FW for better microbial attachment were confirmed in scanning electron microscopy (SEM). Anaerobic digestion showed increased methanogenic activity (10.17 mL g^{-1} $VS_{initial}$ d^{-1}) in pretreated FW, during 86-day experimental period due to better microbial attachment and accessibility during the digestion process. Higher methane yield of 53.58 mL g^{-1} $VS_{initial}$ was observed in pretreated FW. Thus, acetic acid pretreatment is an effective method to improve the utilization and conversion of FW to methane.

Graphical abstract

ScienceDirect

Bioresource Technology
Volume 258, June 2018, Pages 365-375

Review

Enhancement of microalgal growth and biocomponent-based transformations for improved biofuel recovery: A review

El-Sayed Salama [a], Jae-Hoon Hwang [b], Marwa M. El-Dalatony [a], Mayur B. Kurade [a], Akhil N. Kabra [a], Reda A.I. Abou-Shanab [c], Ki-Hyun Kim [d], Il-Seung Yang [a], Sanjay P. Govindwar [a], Sunjoon Kim [a], Byong-Hun Jeon [a]

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https://doi.org/10.1016/j.biortech.2018.02.006
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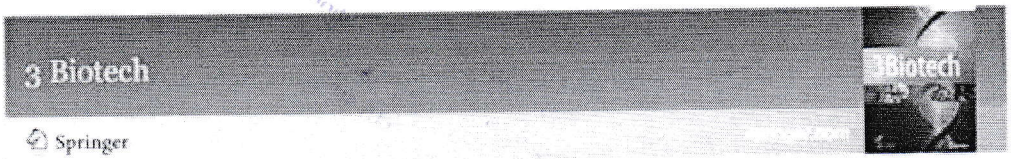
Abstract

Microalgal biomass has received much attention as feedstock for biofuel production due to its capacity to accumulate a substantial amount of biocomponents (including lipid, carbohydrate, and protein), high growth rate, and environmental benefit. However, commercial realization of microalgal biofuel is a challenge due to its low biomass production and insufficient technology for complete utilization of biomass. Recently, advanced strategies have been explored to overcome the challenges of conventional approaches and to achieve maximum possible outcomes in terms of growth. These strategies include a combination of stress factors; co-culturing with other microorganisms; and addition of salts, flue gases, and phytohormones. This review summarizes the recent progress in the application of single and combined abiotic stress conditions to stimulate microalgal growth and its biocomponents. An innovative schematic model is presented of the biomass-energy conversion pathway that proposes the transformation of all potential biocomponents of microalgae into biofuels.

Introduction

Microalgal biomass is a sustainable and renewable form of green bioenergy (biofuels) (Elrayies, 2018). Microalgae are photosynthetic microorganisms with simple growing requirements (light, CO_2, N, P, and trace



3 Biotech. 2018 Mar; 8(3): 158.
Published online 2018 Mar 2. doi: 10.1007/s13205-018-1188-0

PMCID: PMC5834409
PMID: 29515964

Bio-ethanol production from waste biomass of *Pogonatherum crinitum* phytoremediator: an eco-friendly strategy for renewable energy

Pankajkumar R. Waghmare,[#1] Anuprita D. Watharkar,[#1] Byong-Hun Jeon,[2] and Sanjay P. Govindwar[1,2]

Abstract

In this study, we have described three steps to produce ethanol from *Pogonatherum crinitum*, which was derived after the treatment of textile wastewater. (a) Production of biomass: biomass samples collected from a hydroponic *P. crinitum* phytoreactor treating dye textile effluents and augmented with Ca-alginate immobilized growth-promoting bacterium, *Bacillus pumilus* strain PgJ (consortium phytoreactor), and waste sorghum husks were collected and dried. Compositional analysis of biomass (consortium phytoreactor) showed that the concentration of cellulose, hemicelluloses and lignin was 42, 30 and 17%, respectively, whereas the biomass samples without the growth-promoting bacterium (normal phytoreactor) was slightly lower, 40, 29 and 16%, respectively. (b) Hydrolysate (sugar) production: a crude sample of the fungus, *Phanerochaete chrysosporium* containing hydrolytic enzymes such as endoglucanase (53.25 U/ml), exoglucanase (8.38 U/ml), glucoamylase (115.04 U/ml), xylanase (83.88 U/ml), LiP (0.972 U/ml) and MnP (0.459 U/ml) was obtained, and added to consortium, normal and control phytoreactor derived biomass supplemented with Tween-20 (0.2% v/v). The hydrolysate of biomass from consortium phytoreactor produced maximum reducing sugar (0.93 g/l) than hydrolysates of normal phytoreactor biomass (0.82 g/l) and control phytoreactor biomass (0.79 g/l). FTIR and XRD analysis confirmed structural changes in treated biomass. (c) Ethanol production: the bioethanol produced from enzymatic hydrolysates of waste biomass of consortium and normal phytoreactor using *Saccharomyces cerevisiae* (KCTC 7296) was 42.2 and 39.4 g/l, respectively, while control phytoreactor biomass hydrolysate showed only 25.5 g/l. Thus, the amalgamation of phytoremediation and bioethanol production can be the truly environment-friendly way to eliminate the problem of textile dye along with bioenergy generation.

Electronic supplementary material

ScienceDirect

Meta Gene

Volume 16, June 2018, Pages 108-116

Implication of ITS phylogeny for biogeographic analysis, and comparative study of morphological and molecular interspecies diversity in Indian *Impatiens*

Asif S. Tamboli [a], Jagdish V. Dalavi [b], Swapnil M. Patil [c], Shrirang R. Yadav [b], Sanjay P. Govindwar [a d]

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https://doi.org/10.1016/j.mgene.2018.02.005

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Highlights

- This is the first report on interspecies genetic diversity study on Indian *Impatiens*
- Resolution of species obtained using ISSR markers moderately support the sectional classification of *Impatiens* species
- Both of morphological markers and ISSR markers are useful for displaying the diversity in *Impatiens* species
- ISSR markers are very promising for further genetic diversity studies on *Impatiens*.
- Biogeographic analysis based on ITS phylogeny confirming the South East Asian origin of *Impatiens*

Abstract

ScienceDirect

Journal of Environmental Chemical Engineering

Volume 6, Issue 2, April 2018, Pages 1589-1600

Enhanced decolorization and biodegradation of acid red 88 dye by newly isolated fungus, *Achaetomium strumarium*

Paul O. Bankole [a b], Adedotun A. Adekunle [b], Sanjay P. Govindwar [c]

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https://doi.org/10.1016/j.jece.2018.01.069

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Abstract

Acid red 88 dye degradation efficiency of newly isolated filamentous fungus, *Achaetomium strumarium* were investigated. Molecular studies of 23S rRNA sequence data confirmed the phylogenetic clade relationship of the isolate with members of the same genus, *Achaetomium*. *Achaetomium strumarium* decolorized (99%) of 10 mg L^{-1} of acid red 88 dye at pH (4), biomass dose (2000 mg) and temperature (40 °C) within 96 h. Further studies revealed that decolorization was enhanced with the addition of calcium salts in the reaction medium resulting in maximum amount of dye adsorbed (35.55 mg g^{-1}). The experimental data showed the best goodness of fit when subjected to Temkin isotherm model ($R^2 = 0.985$) in comparison with Freundlich and Langmuir isotherm models ($R^2 = 0.883$ and 0.688) respectively. The adsorption mechanism followed pseudo-second order kinetic model ($R^2 = 0.997$) indicating the influence of the AR88 dye molecules and fungal biomass. Enzymes analysis revealed significant inductions and role played by NADH-DCIP reductase and laccase in the asymmetric cleavage, dehydroxylation, and desulfonation of AR-88 dye. Metabolites of the acid red 88 dye after degradation were analyzed using UV–vis spectroscopy, FTIR, HPLC and GCMS. The GCMS analysis revealed the production of three intermediates; naphthalen-2-ol, sodium naphthalene-1-sulfonate and 1,4-dihydronaphthalene. Possible metabolic fate pathway for the degradation of AR88 dye by *A. strumarium* was proposed. The results obtained from toxicity studies revealed the AR-88 dye detoxification efficiency of *Achaetomium strumarium* and hence, in its myco-transformation.

Introduction

ScienceDirect

Ecotoxicology and Environmental Safety

Volume 148, February 2018, Pages 17-25

Decolorization and detoxification of dye mixture and textile effluent by lichen *Dermatocarpon vellereceum* in fixed bed upflow bioreactor with subsequent oxidative stress study

ashwini N. Kulkarni [a], Anuprita D. Watharkar [b], Niraj R. Rane [c], Byong-Hun Jeon [d], Sanjay P. Govindwar [b d]

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https://doi.org/10.1016/j.ecoenv.2017.10.001

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Abstract

Navy Blue HE22 (NBHE22), dye mixture and real textile effluent were decolorized and degraded by lichen *Dermatocarpon vellereceum*. Up-flow bioreactor showed about 80%, 70%, 80% and 65% removal of American dye manufacturer index (ADMI), biological oxygen demand (BOD), total suspended solids (TSS) and total dissolved solids (TDS), respectively of dye mixture at flow rate of 25 ml h^{-1}. The removal of ADMI, BOD, TSS and TDS of real textile effluent were 75%, 65%, 82% and 70%, respectively at flow rate of 30 ml h^{-1}. Significant induction of extracellular enzymes such as manganese peroxidase and lignin peroxidase was observed up to 46% and 36% during decolorization of dye mixture, while 43% and 24% during effluent treatment, respectively. Exponential enhancement in the activities of stress enzymes such as catalase (CAT) and guaiacol peroxidase (GPX) was observed after exposure to NBHE22 (116% and 125%, respectively), dye mixture (150% and 300%, respectively) and effluent (400% and 350%, respectively) endorsing the stress tolerance ability of model lichen. Phytotoxicity and genotoxicity studies demonstrated less toxic nature of metabolites resulted from biodegradation.

Introduction

Textile dyes are the chemical compounds synthesized to impart color to the fabric. Textile industry is the second largest employment generating industry in India thus plays a socioeconomically important role.

ScienceDirect

Environmental Research

Volume 160, January 2018, Pages 1-11

Phytobeds with *Fimbristylis dichotoma* and *Ammannia baccifera* for treatment of real textile effluent: An *in situ* treatment, anatomical studies and toxicity evaluation

Suhas K. Kadam [a], Vishal V. Chandanshive [a], Niraj R. Rane [b c], Swapnil M. Patil [b], Avinash R. Gholave [d], Rahul V. Khandare [b], Amrut R. Bhosale [e], Byong-Hun Jeon [f], Sanjay P. Govindwar [a f]

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https://doi.org/10.1016/j.envres.2017.09.009

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Abstract

Fimbristylis dichotoma, Ammannia baccifera and their co-plantation consortium FA independently degraded Methyl Orange, simulated dye mixture and real textile effluent. Wild plants of *F. dichotoma* and *A. baccifera* with equal biomass showed 91% and 89% decolorization of Methyl Orange within 60 h at a concentration of 50 ppm, while 95% dye removal was achieved by consortium FA within 48 h. Floating phyto-beds with co-plantation (*F. dichotoma* and *A. baccifera*) for the treatment of real textile effluent in a constructed wetland was observed to be more efficient and achieved 79%, 72%, 77%, 66% and 56% reductions in ADMI color value, COD, BOD, TDS and TSS of textile effluent, respectively. HPTLC, GC-MS, FTIR, UV–vis spectroscopy and activated oxido-reductive enzyme activities confirmed the phytotrasformation of parent dye in to new metabolites. T-RFLP analysis of rhizospheric bacteria of *F. dichotoma, A. baccifera* and consortium FA revealed the presence of 88, 98 and 223 genera which could have been involved in dye removal. Toxicity evaluation of products formed after phytotransformation of Methyl Orange by consortium FA on bivalves *Lamellidens marginalis* revealed less damage of the gills architecture when analyzed histologically. Toxicity measurement by Random Amplification of Polymorphic DNA (RAPD) technique revealed bivalve DNA banding pattern in treated Methyl Orange sample suggesting less toxic nature of phytotransformed dye products.

Graphical abstract

Original Article | Published: 20 October 2017

Molecular phylogeny and genetic diversity of genus *Capparis* (Capparaceae) based on plastid DNA sequences and ISSR markers

Asif S. Tamboli, Pradnya B. Yadav, Aatiya A. Gothe, Shrirang R. Yadav & Sanjay P. Govindwar

Plant Systematics and Evolution **304**, 205–217 (2018)

Abstract

Capparis (Capparaceae) has been used as a medicinal plant since ancient time. *Capparis* species were divided into Old World and New World taxa as described by the sectional division of *Capparis*. ...owever, plastid DNA sequence data of Indian

Chapter

Phytoremediation as a Green and Clean Tool for Textile Dye Pollution Abatement in Phytoremediation of Environmental Pollutants.

December 2017

DOI:10.4324/9781315161549-13

In book: Phytoremediation of Environmental Pollutants · Chapter: Phytoremediation as a Green and Clean Tool for Textile Dye Pollution Abatement · Publisher: CRC Press, Taylor & Francis Group, Boca Raton, FL 33487-2742 · Editors: Ram Chandra, N. K. Dubey, Vineet Kumar

Authors:


Niraj Rane
Hanyang University


Rahul V. Khandare
Amity University, Mumbai


Anuprita D Watharkar
Amity University, Mumbai, India


Sanjay P Govindwar
Hanyang University

... This remarkable phytoremediative capacity is related above all to the genetic adaptation that has allowed the plants to become, over time, autotrophic bioreactors capable of alleviating environmental stress (Bharathiraja et al., 2018;Tahir, Yasmin, & Khan, 2016). It is undoubtedly a true green technology provided by nature itself (Rane, Khandare, Watharkar, & Govindwar, 2017). ...

Effects of textile dyes on health and the environment and bioremediation potential of living organisms

ANALYSIS OF CHALLENGES BEFORE HIGHER EDUCATION IN INDIA

Dr. A. N. Basugade
Associate Professor in Statistics
Gopal Krishna Gokhale College, Kolhapur

Introduction:

The higher education sector has expanded rapidly in the country. India's hig education system is the world's third largest in terms of students, next to China and the Un States. In future, India will be one of the largest education hubs. India's Higher Educa sector has witnessed a tremendous increase in the number of Universities/University I Institutions & Colleges since independence. The 'Right to Education Act' which stipul compulsory and free education to all children within the age groups of 6-14 years, has bro about a revolution in the education system of the country. Yet there is inequality in gro access and distribution. Dadra and Nagar Haveli and Lakshadweep have hardly any institution higher learning; 14 states have much higher levels of access to higher education compare the national average (12.17) in terms of number of institutions available per lakh populati the age group 18-23. One of the major challenges is to enhance the access to higher educa The state has a major role to play in this regard. There is confusion as regards entry, fees the type of courses/programs that can be offered. This has resulted in an unhealthy re between politicians, Government and private service providers. Various Committees statutory bodies have reviewed the higher education scenario in the country and recommended future courses of action. Kothari Commission, National Knowledge Commis CABE Committee on Autonomy in Higher education and Yashpal Committee are some of major contributors on the subject. State of higher education in India is in between good bad. India has 670 universities, about 38,000 colleges, 8,20,000 professors & lecturers over 2,80,00,00 students were enrolled. There is growth in number of colleges, universi students and teachers year after year. But the quality of education in India at higher educa is significantly poor as compared to major developing nations of the world. As of 2008, In post-secondary institutions offer only enough seats for 7 per cent of India's college population, 25 per cent of teaching positions nationwide are vacant, and 57 per cent of co professors lack either a master's or Ph.D. degree.

Major Challenges Before Higher Education:

1. Teaching Quality:

The first issue that higher education in India facing is decreasing teaching qu Teachers are not well trained and qualified for the job that they have assigned. Some coll appoint young graduates as professors without any training of teaching techniques and didn't have any experience and knowledge. At present, there is no mechanism for ensuring accountability & performance of professor in colleges and universities.

2. Shortage of Resources:

Huge enrolment in higher education is handled by state universities and their affil colleges. These state universities receive very small amounts of funds. Nearly 65% of the

VOLUME - VIII, ISSUE - I - JANUARY - MARCH - 2019
AJANTA - ISSN 2277 - 5730 - IMPACT FACTOR - 5.5 (www.sjifactor.com)

22. Muticultural Apporach in Teaching Statistics

Dr. A. N. Basugade
Professor and Head, Dept. of Statistics, Gopal Krishna Gokhale College, Kolhapur.

Abstract

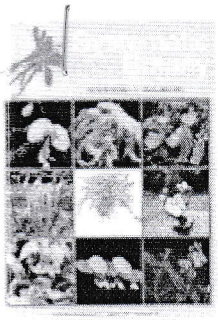
Now a days student population is changing rapidly and steadily reflects the myriad of cultures it represents. Students should be able to use a statistical idea to further and their understanding of other statistical ideas, and they should be able to apply statistical thinking & modeling to solve problems that arise in other disciplines. Furthermore, they should understand the role of statistics in our multicultural society and the contributions of various cultures to the advancement of statistics. Culture, in this particular instance, includes but not limited to ethnicity, socio-economic status, language, geographic origin, learning manner and abilities, gender etc. It is sensible to reexamine our teaching approaches and to think carefully about the role of multicultural approach in the teaching and learning of our students.

In this paper we discuss about the need of multicultural approach in teaching statistics, how it can be employed and of the guidelines to use multicultural approach in teaching statistics.

Key words: multicultural, Statistics, teaching.

1. Introduction

The aims and objectives of multicultural education tend to vary among educational philosophers and liberal political theorists. Educational philosophers argue for preservation of the minority group culture, by fostering children's development of autonomy and introducing them to new and different ideas. This form of exposure assists students in thinking more critically, as well as, encourage them to have a more open mindset. On the other hand, political theorists advocate a model of multicultural education that warrants social action. Hence, students are equipped with knowledge, values, and skills necessary to evoke and participate in societal changes, resulting in justice for otherwise victimized and excluded ethnic groups. Under such a situations, teachers serve as agents of such change, promoting relevant democratic values and empowering students to act. Multicultural education also has other gains and goals. They are i) Increase self-esteem of non-mainstream students ii) Increase diversified student exposure iii)



Resolving Generic Boundaries in Indian-Australasian Cleomaceae: Circumscription of *Areocleome*, *Arivela*, and *Corynandra* as Distinct Genera

Authors: Barrett, Russell L.; Roalson, Eric H.; Ottewell, Kym; Byrne, Margaret; Govindwar, Sanjay P.; Yadav, Shrirang R.; Tamboli, Asif S.; Gholave, Avinash R.
Source: Systematic Botany, Volume 42, Number 4, December 2017, pp. 694-708(15)
Publisher: American Society of Plant Taxonomists
DOI: https://doi.org/10.1600/036364417X696401

Abstract | References | Citations | Supplementary Data | Suggestions

Abstract—

Novel molecular data and morphological studies have provided support for the segregation of numerous genera from *Cleome* s. l. (Cleomaceae). *Corynandra* has been proposed as a segregate genus including Indian and Australian species based on floral and seed morphology. Contrasting seed coat micro-morphology between Indian and Australian species included in *Corynandra* raised questions over the monophyly of that genus concept. Relationships among the Indian and Australian species remain unclear due to limited sampling in previous molecular analyses. We expanded the sampling of taxa from India and Australia in order to clarify relationships between these species and the circumscription of *Corynandra*. Comprehensive sampling of Indian and Australian species formed three well-supported clades based on analyses of molecular sequence data and we conclude that *Corynandra* is not related to the Australian species. The genus *Arivela* Raf. is reinstated for the majority of Australian species. The new genus ***Areocleome*** is described to accommodate the unusual Australian C_4 species *Cleome oxalidea*. The following new combinations are made: ***Areocleome oxalidea*** , ***Arivela arenitensis, Arivela bundeica, Arivela cleomoides, Arivela insolata, Arivela kenneallyi, Arivela limmenensis, Arivela linophylla, Arivela lophosperma, Arivela microaustralica, Arivela tetrandra, Arivela uncifera, Corynandra aspera*** , and ***Corynandra simplicifolia*** . ***Arivela microphylla*** is raised to species level and provided with a new combination.

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Gene Reports

Volume 9, December 2017, Pages 54-60

Comparative analyses of enzymatic activity, structural study and docking of fungal cellulases

Asif S. Tamboli [a], Pankajkumar R. Waghmare [a], Rahul V. Khandare [b], Sanjay P. Govindwar [a]

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https://doi.org/10.1016/j.genrep.2017.08.008

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Abstract

Aspergillus cellulase was observed to show superior hydrolysis of microcrystalline cellulose (Avicel PH101) when compared to Trichoderma cellulase. *In silico* physicochemical characterization revealed the acidic nature of selected fungal cellulases. GRAVY index for *Aspergillus* and *Trichoderma* cellulase was −0.314 and −0.374, respectively. Negative values of GRAVY index for both the fungal cellulases indicate that these enzymes have better interaction with water. Secondary structures such as alpha helices (34.44%) and random coils (54.21%) were found to be dominant in *A. niger* and *T. longibrachiatum* cellulase, respectively. Validation results for homology modeled 3D structures of selected cellulases indicated their fine quality. The analyses revealed that 96.7 and 92.4% residues of the constructed cellulase models of *A. niger* and *T. longibrachiatum* were placed in the favored region, respectively with >82 ERRAT overall quality factor and have >0.7 QMEAN 4 score. ProSA evaluation revealed that the *Z*-score for *A. niger* and *T. longibrachiatum* cellulase was −9.2 and −6.78, respectively. Energy minimization results revealed that the potential energies -7.140×10^{5} kJ/mol and -1.228×10^{6} kJ/mol were found remaining constant after 744 and 1431 steps for *A. niger* and *T. longibrachiatum* cellulases, respectively. Molecular docking study revealed that TRP 200, THR 201 and GLU 160 residues from *A. niger* cellulase and ASP 220, GLN 196, TYR 192 and TYR 168 residues from *T. longibrachiatum* cellulase interact with the cellulose. Studies such as this could prove to be helpful in terms of formulating cellulase enzyme for the purpose of industrial use.

Graphical abstract

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Journal of Environmental Chemical Engineering

Volume 5, Issue 5, October 2017, Pages 4639-4648

Research paper

Degradation of indigo dye by a newly isolated yeast, *Diutina rugosa* from dye wastewater polluted soil

Paul O. Bankole [a b e], Adedotun A. Adekunle [b], Olayide F. Obidi [c], Olumide D. Olukanni [d], Sanjay P. Govindwar [e]

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https://doi.org/10.1016/j.jece.2017.08.050

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Abstract

Isolation, identification, and characterization of newly isolated yeast, *Diutina rugosa* capable of decolorizing indigo dye were investigated in this study. Molecular and phylogenetic analyses of 23S rRNA sequence data indicated that the yeast belonged to the new genus, *Diutina*. The optimization of physicochemical parameters such as pH of the solution (2–8), initial dye concentration (10–60 mg L^{-1}), adsorbent mass (0.1–2 g), and temperature (10–50 °C) was studied to scale- up the conditions of dye removal. Furthermore, complete decolorization (99.97%) of indigo dye (10 mg L^{-1}) was achieved at pH 2, temperature 30 °C and 2.0 g cell biomass within 5 days. Degradation was monitored through UV–vis spectrophotometric, FTIR, and GCMS analyses. The results of FTIR analysis obtained revealed the loss and shifts in spectra peaks of the experimental in comparison with the biological control. Possible degradation pathway was proposed using the intermediate metabolites; 1, 2-dihydro-3*H*-indol-3-one and cyclopentanone obtained through GCMS analysis. The enzyme analyses revealed significant inductions and major roles played by NADH-DCIP reductase and lignin peroxidase in the asymmetric cleavage, initial reduction and deamination of indigo dye. The equilibrium experimental data were fitted to Langmuir, Freundlich and Temkin adsorption isotherms with high adjusted coefficient of determination values; adjR^2=0.907, adjR^2=0.867, and adjR^2=0.965 respectively. However, the Langmuir and Temkin adsorption isotherms affirmed the monolayer and heterogeneous biosorption characteristics of *Diutina rugosa*. Temkin adsorption isotherm model (R^2=0.971) represented the best fit of experimental data than other isotherm models.

Graphical abstract

Original Article | Published: 29 June 2017

Sorghum husk biomass as a potential substrate for production of cellulolytic and xylanolytic enzymes by *Nocardiopsis* sp. KNU

Siddheshwar D. Kshirsagar, Bhumika N. Bhalkar, Pankajkumar R. Waghmare, Ganesh D. Saratale, Rijuta G. Saratale & Sanjay P. Govindwar

3 Biotech **7**, Article number: 163 (2017)

Abstract

Nocardiopsis sp. KNU was found to degrade various lignocellulosic waste materials, namely, sorghum husk, sugarcane tops and leaves, wheat straw, and e husk very efficiently. The strain was found to

Phytoextracts protect Saccharomyces cerevisiae from oxidative stress with simultaneous enhancement in bioremediation efficacy

Article in Indian Journal of Experimental Biology · April 2017

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Project Construction of wetland, phytobeds for efficient cleaning of textile effluent. View project

Project DNA bar-coding of genus Chlorophytum from Indian sub-continent View project

Short Research and Discussion Article
Published: 17 January 2017

Phytoremediation of fluoride with garden ornamentals *Nerium oleander*, *Portulaca oleracea*, and *Pogonatherum crinitum*

Rahul V. Khandare, Shaileshkumar B. Desai, Sourabh S. Bhujbal, Anuprita D. Watharkar, Shivtej P. Biradar, Pankaj K. Pawar & Sanjay P. Govindwar

Environmental Science and Pollution Research **24**, 6833–6839 (2017)

Abstract

Nursery grown plants of *Nerium oleander*, *Pogonatherum crinitum*, and *Portulaca oleracea*

ScienceDirect

Journal of Hazardous Materials
Volume 338, 15 September 2017, Pages 47-56

Research paper

Co-plantation of aquatic macrophytes *Typha angustifolia* and *Paspalum scrobiculatum* for effective treatment of textile industry effluent

Vishal V. Chandanshive [a], Niraj R. Rane [b], Asif S. Tamboli [a], Avinash R. Gholave [c], Rahul V. Khandare [b], Sanjay P. Govindwar [a]

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https://doi.org/10.1016/j.jhazmat.2017.05.021

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Abstract

Field treatment of textile industry effluent was carried out in constructed drenches (91.4 m × 1.2 m × 0.6 m; 65.8 m^3) planted independently with *Typha angustifolia*, *Paspalum scrobiculatum* and their co-plantation (consortium-TP). The *in situ* treatment of effluent by *T. angustifolia*, *P. scrobiculatum* and consortium-TP was found to decrease ADMI color value by 62, 59 and 76%, COD by 65, 63 and 70%, BOD by 68, 63 and 75%, TDS by 45, 39 and 57%, and TSS by 35, 31 and 47%, respectively within 96 h. Heavy metals such as arsenic, cadmium, chromium and lead were also removed up to 28–77% after phytoremediation. *T. angustifolia and P. scrobiculatum* showed removal of Congo Red (100 mg/L) up to 80 and 73%, respectively within 48 h while consortium-TP achieved 94% decolorization. Root tissues of *T. angustifolia* and *P. scrobiculatum* revealed inductions in the activities of oxido-reductive enzymes such as lignin peroxidase (193 and 32%), veratryl alcohol oxidase (823 and 460%), laccase (492 and 182%) and azo reductase (248 and 83%), respectively during decolorization of Congo Red. Anatomical studies of roots, FTIR, HPLC, UV–vis Spectroscopy and GC–MS analysis verified the phytotransformation. Phytotoxicity studies confirmed reduced toxicity of the metabolites of Congo Red.

Graphical abstract

SHIFT OF HELICOVERPA ARMIGERA FROM ONE HOST TO ANOTHER AFFECTS GUT BACTERIAL DIVERSITY

Article · February 2017

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Ashok A. Shinde
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Biocatalysis and Agricultural Biotechnology
Volume 9, January 2017, Pages 209-217

Biodegradation and detoxification of azo solvent dye by ethylene glycol tolerant ligninolytic ascomycete strain of *Pseudocochliobolus verruculosus* NFCCI 3818

Monali Nikam [a], Sandeep Patil [a], Ulhas Patil [b], Rahul Khandare [c], Sanjay Govindwar [d], Ambalal Chaudhari [a]

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https://doi.org/10.1016/j.bcab.2017.01.004
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Abstract

Ligninolytic microorganisms or enzymes mediated biodegradation of toxic pollutants was studied extensively; but hydrophobic waste management is a major environmental concern. For this reason, 80 fungal strains were isolated from various ligninocellulosic containing microhabitats and around 27.91% strains, demonstrated the ligninolytic activity. Screened isolates were further examined for organic solvent tolerance and the fungal strain LSF9 displayed better growth along with laccase ($157 UL^{-1}$), lignin peroxidase (LiP; $12 UL^{-1}$) and manganese peroxidase (MnP; $8.6 UL^{-1}$) activity in the presence of water miscible ethylene glycol. The strain LSF9 was further identified as *Pseudocochliobolus verruculosus* based on the morphotaxonomic and molecular approach. The *P. verruculosus* was able to degrade water insoluble Solvent yellow 2 and display 98% decolorization with maximum laccase activity ($52.74 UL^{-1}$). The degradation profile and metabolic fate of fungus treated dye was revealed by HPLC, FTIR and GC-MS analysis. The phytotoxicity study of fungus treated dye on *Triticum aestivum* (wheat) and Vigna *radiata* (mong bean) confirmed the nontoxic nature as compare to the phytotoxic Solvent yellow 2 dye. Thus, the present study suggests the potential of ethylene glycol tolerant *P. verruculosus* for environmental decontamination of solvent soluble azo dyes.

Graphical abstract

ScienceDirect

Chemical Engineering Journal
Volume 307, 1 January 2017, Pages 1026-1036

Monitoring the gradual biodegradation of dyes in a simulated textile effluent and development of a novel triple layered fixed bed reactor using a bacterium-yeast consortium

Mayur B. Kurade [a b], Tatoba R. Waghmode [c d], Swapnil M. Patil [b], Byong-Hun Jeon [a], Sanjay P. Govindwar [c]

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https://doi.org/10.1016/j.cej.2016.09.028
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Abstract

Textile industry effluents contain a variety of dyes, which are normally resistant to biodegradation. A bacterial-yeast consortium (*Brevibacillus laterosporus* and *Galactomyces geotrichum*) was used for decolorization of two real textile effluents (RTE) and a simulated synthetic effluent (SSE). It showed enhanced decolorization compared to that of individual microorganisms with decolorization efficiency of 89, 60 and 69% for RTE-1, RTE-2 and SSE respectively, within 48 h. The cumulative action of oxido-reductive enzyme in the consortium was responsible for improved decolorization. Spectroscopic analysis suggested effective biodegradation of dyes present in the SSE by the consortium contrarily to the individual strains. The gradual biodegradation of each dye present in the SSE was monitored using high performance thin layer chromatography (HPTLC). The consortium biodegraded all of the dyes within 1 h as compared to that of partial biodegradation by the individual microorganisms. A novel, triple layered fixed bed reactor was designed for continuous decolorization of effluent. It showed >80% decolorization (at 100 mL h^{-1} flow-rate), for a period of 7 days, along with ~78% reduction in COD. The reproducibility of the bioreactor could be maintained for three consecutive cycles (7 days each).

Graphical abstract

I J R B A T, Vol. V, Issue (2), May-2017: 1-3 ISSN (Online) 2347 –517X

INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE & TECHNOLOGY
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CONTOUR DENSITIES USING DISCRETE PROBABILITY DISTRIBUTIONS

Basugade A. N.

Gopal Krishna Gokhale College, Kolhapur (M.S) India
Email: *anb9@rediffmail.com*

Abstract: When the data collected or the experiment conducted is under ideal conditions, well-known statistical model may give a better fit. But when the situations are not ideal due to presence of some distorting factors, standard model may not give a good fit for the data set. One possible method to take an account of this distorting factor is to modify the existing model. In this article we generate densities based on the size of Contours of a discrete density function. As an Illustration contour densities of Geometric distribution have been discussed.

Keywords: Contour Transformation, Discrete distributions, Unimodal

Introduction:

Sometimes a proposed well- known statistical model may not give a very satisfactory fit for a collected data set. This might be due to typical inherent behavior of the phenomenon that gives rise to the specific data in hand and the model attempted being incapable of capturing such a behavior. The epsilon-skew normal density proposed by Mudholkar and Hutson (2000) gives better fit for certain data sets and can be obtained by the CT of a Normal density.

In the literature some methods to modify a model to give a better fit for the data set have been reported. Marshal and Olkin (1997) have extended the class of exponential and Weibull family by introducing an additional parameter. Fernandez and Steel (1998) have proposed a technique of generating unimodal skewed distributions from a symmetric unimodal distributions by using a scalar parameter.

New families of distributions have also been introduced using the concepts of conditioning or truncation. For example one may refer to Azzalini (1985) and Azzalini and Dalla Valle (1996) and Arnold et al. (2002).

Fernandez, *et al.* (1995) have proposed u- spherical multivariate densities and studied their robustness properties. Rattihalli and Basugade (2008) have generated a class of multivariate densities by using contour transformation. Basugade (2015) have generated densities based on the size of Contours of a continuous density function f.

Here we generate densities based on the size of Contours of discrete probability distributions. As an Illustration contour densities of Geometric distribution have been discussed.

Basic concepts:

Let f(x), $x \in \Re^k$ be a p. d. f. and zero be the modal value. For $0 \le u \le f(0)$, the set $\{x: f(x) = u\}$ is called as a contour of f, or an u-level set of f. However for convenience the set

$C_f(u) = \{x: f(x) \ge u\}$ (1)

be called the u-contour of f and

$C_f(0)$=support of f = $\lim_{k \to \infty} \{ c_f(u_k) \}$, (2)

whereu_k is any sequence decreasing to zero.

Contour Transformation: Let f be a density function with modal value 0. For $0 \le u \le f(0)$ we consider a transformation of contour $C_f(u)$ to $C^*(u)$ such that

i) the class $\{C^*(u) : 0 \le u \le f(0)\}$ is non-increasing in u (3)

and

ii) $\wedge(C_f(u)) = \wedge(C^*(u))$, $0 \le u \le f(0)$. (4)

where, $\wedge$ is the Lebesque measure on $\Re^k$. Note that corresponding to such a class $\mathbf{C}^* = \{C^*(u): 0 \le u \le f(0)\}$ there exists a function f^* (say) given by $f^*(x) = \sup\{u: x \in C^*(u)\}$ such that $C^*(u) = C_{f^*}(u)$, $0 \le u \le f(0)$. It is to be noted that, from condition (3), corresponding to the class $\mathbf{C}^*$, there exists a function f^* and is p. d. f.. The requirement (3) is a major constraint on a CT. An