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# Bianchi Type-I Perfect Fluid Model in Bimetric Theory of Gravitation

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## Abstract

Bianchi type-I cosmological model as related to perfect fluidinbimetric theory of gravitation have been deduced. The perfect fluid model has hyperbolic geometry and all its physical parameters are also hyperbolic in nature and therefore they have been studied from hyperbolic geometric view point. All these models are isotropize and shear-less. Other geometrical and physical behaviors of the models have also been studied.

**Keywords:** Bianchi type-I; bimetric gravitational theory; cosmology; hyperbolic geometric; isotropize;geometry

## 1. Introduction

Rosen's (1973, 1975) bimetric theory of gravitation is one of the alternatives to general relativity and it is free from singularities appearing in the big-bang of cosmological models and it obeys the principle of covariance and equivalence of the general relativity. Therefore, the people are interested in investigating the cosmological models of the universe in bimetric theory of gravitation based on two matrices; one is Riemannian metric which described the geometry of curved space time, and the second is flat metric which refers to the geometry of the empty universe (no matter but gravitation is there) and described the initial forces.

The Rosen's field equations in bimetric theory of gravitation are

$$N^{\mu\nu} - \frac{1}{2} N \delta^{\mu\nu} = -T^{\mu\nu}, \tag{1}$$

where

$$N^{\mu\nu} = \frac{1}{2}\gamma^{\alpha\beta}\left(g^{\mu\sigma}g^{\nu\tau}_{|\alpha}{}_{|\beta} + \ldots\right),$$

$N = g^{\mu\nu}N_{\mu\nu}$, is the Rosen scalar. The vertical bar ( | ) stands for $\gamma$-covariant differentiation where $g = \det(g_{\mu\nu})$ and $\gamma = \det(\gamma_{\mu\nu})$. Many researchers have developed the theory and investigated many cosmological models of the universe in bimetric theory of gravitation and in general relativity, and studied their behavior geometrically and physically [Karade (1980), Israelit (1981), Reddy et al. (1989, 1998), Mohanty et al. (2002), Bali (2003a, 2003b, 2005, 2006, 2007), Katore (2006), Khadekar (2007), Borkar (2010a, 2013, 2014a, 2014b), Gaikwad (2011)]. Athough the non – existence of Bianchi types I, III, V and $VI_0$ cosmological models

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# HISTOLOGICAL STUDIES ON THE OVARY IN THE BEETLE, CYBISTER TRIPUNCTATUS OL. (COLEOPTERA: DYTISCIDAE)

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**ABSTRACT:**

A pair of large ovaries are situated on either side of the alimentary canal occupying most of the abdominal cavity. Each ovary is composed of large number of ovarioles. The ovarioles are differentiated Antero posteriorly into four regions: terminal filament, germarium, vitellarium and pedicel. The vitellarium consists of a series of developing oocytes in linear fashion, each accompanied with a group of 15 nurse cells and thus representing polytropic – Meroistictype.The terminal oocyte undergo development through a series of consecutive 5 vitellogenic stages such as pre,early,mid,late and maturational stages. The deposition of yolk starts at the early vitellogenic stage dyring which transport of fine granules from follicular cells to the oocyte is well evident.During mid and late vitellogenic stages the oocyte grows in size and filled with the yolk bodies. The nurse cells initially transport RNA to the vitellogenic oocyte and undergo degeneration prior to late vitelogenicstage. Thy histochemical and biochemical studies show protein lipid and carbohydrate composition of yolk material.

**Keywords:** *Vitellogenesis, RNA, Yolk*

## INTRODUCTION:

Female reproductive system and mecdhanism of oocyte development andvitellogenesis is of prime importance. The present work has, therefore, beingunder taken to study female reproductive system in Cybister tripunctatus with special reference to the following aspects-

1. Morphology of female reproductive system;
2. Cytological changes occurring in developing oocytes, nurse cells andFollicular epithelial cells;
3. Histochemical demonstration of synthesis, accumulation and transport of DNA, RNA, protein, carbohydrate and lipid during oogenesis;
4. Histochemical and biochemical analysis of the yolk material and secretory material of the colleterial gland and

Thorough study of the process of vitellogenesis. Become surrounded by follicular epithelium and connected by the trophic cord.The young oocytes occur in previtellogenic stage during which the trophocytes transport material to the oocytes needed for their development. The nutritive cord collapse during vitellogenesis. The terminal oocytes undergo the process of vitellogenesis and finally the follicular epithelium secretes a vitelline mimbrance and the chorion. The number of ovarioles vary between species from one in some Scarabaeinae to about thousands in Meloproscarabaeus (Engelman, 1979; Raabe, 1986). The base of each ovariole forms a pedical which unites and opens into a lateral oviduct. The lateral oviducts join to form a single median oviduct which is generally muscular and ectodermal in origin. Cytological changes are observed in the cell lining of the oviducts. In Oncopltus fasciatus the cells of the anterior region of oviduct show secreatory activity, whereas, the cells of the posterior part help in the deposition of cuticle (Chen et al., 1962). The distal end of the common oviduct forms the gonopore which opens into the genital chamber. The genital chamber consists of the vagina which is present between the gonopore the external vulva. The vagina is covered with thick muscle layer and lined by a cuticular intima. The genital chamber is modified forming the bursa copulatrix which stores the spermatophores. In Lepidoptera, the bursa is located on the 8th abdominal Segment and is connected with the vagina by the seminal duct. In some butterflies e.g. Danus, tooth-like cuticular denticles are present in the Dursa copulatrix which help to cut-open the spermatophores. A pair of ectodermal glands are found associated with the genital chamber i.e. the spermathescae. The paired accessory glands or colleterial glands open into the vagina (Callahan and Chapin, 1960; Matsuda,1976).The morphology and number of spermathecae vary from species to species. In most insects, it is a single spherical organ and may have its distal end specialized for secretion to from the spermathecal accessory gland. The secretion of spermathecal gland is mucoprotein

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RESEARCH REPORT

# Comparative analysis of nutritional value in yellow mustard seeds infected by individual test fungi

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ABSTRACT

Yellow mustard (*Brassica juncea* cv Heera) developed at Department of Botany, Nagpur University Nagpur. The seed coat color is golden yellow. The oil content is 35 percent while the erucic acid is zero and glucosinolate is very low in defatted meal.

In the present study attempts have been made to evaluate and record the changes in protein, oil, total sugar, reducing sugar and non-reducing sugars due to infestation by the test fungi which are dominant storage fungi occurs under the seed storage. The test fungi are *Alternaria alternata, Aspergillus flavus, A. fumigatus, A. niger, Fusarium moniliforme* and *Penicillium oxalicum*.

After 21 days of incubation with infested test fungi viz. *A. fumigatus, A. niger* and *Penicillium oxalicum*, showed more decline in protein that is -32.04 percentage change over control in protein while test fungi *Aspergillus flavus* showed maximum decrease in oil content that is - 24.78 percentage change over control in oil. After the incubation of 21 days with infested test fungi it was seen that the starch and sugars content of yellow seeds declined, the maximum decrease in starch occurred by *Aspergillus flavus* was - 36.356 percentage change over control while the maximum decrease in total sugars occurred by *Aspergillus niger* was -15.930 percentage change over control.

Keywords: Mustard, Yellow seeds, Test fungi, Protein, Oil, Starch, Sugars.

## INTRODUCTION

In India and certain countries in Africa and South America the losses of food grains due to storage fungi is about 30 percent of the annual harvest. In addition to field diseases, there are number of fungal infections, which occurs during storage period. Poor storage practices and mechanical injuries caused to the grains during harvesting facilitate easy entry of fungal pathogen during storage affecting various metabolites, viz. carbohydrates, protein, lipids, etc. The present study deals with the analysis of biochemical aspects that is protein, oil, starch and sugars content of yellow mustard seeds after the incubation of 7, 14, and 21 days in association of test fungi that is *Alternaria alternata, Aspergillus flavus, A. fumigatus, A. niger, Fusarium moniliforme* and *Penicillium oxalicum*.

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**RESEARCH REPORT**

# Effect of physical and chemical mutagens on meiotic chromosomes in pollen mother cells (PMCs) during microsporogenesis and pollen fertility in *Rivinia humilis* L.

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**ABSTRACT**

The seeds of *Rivinia humilis* L. was subjected to the mutagenic treatment of three mutagnes i.e. gamma rays, sodium azide and ethylmethane sulphonate for the enhancement in dye content obtained from ripened berries. Effect of all the three mutagens on chromosomal aberrations induced in PMCs during microsporogenesis and effect on pollen viability was analysed. Different types of chromosomal aberrations from aberrant prophases, metaphases, anaphases and telophases of both the meiotic divisions in the PMCs from the mutagenized population were recorded. Aberrant phases of both the meiotic divisions have exhibited adverse effect on chromosomal entity by all the mutagens in dose/concentration dependent manner. Chromosomal aberrations in gamma irradiated plants was ranged between 2.74-4.19 % frequencies, whereas, aberrant PMCs ranged between 16.49 to 24.69 %. Both, frequency of chromosomal aberrations and aberrant PMCs have linearly correlated with the concentrations of both the chemical mutagens in all treatment modes. SA induced the chromosomal aberrations, in all treatment mode, in the range of 1.71 to 2.51%, 2.32 to 2.92% and 2.95 to 3.14 % in dry seed, 3h presoaking and 6h presoaking treatment modes, respectively, whereas, the same was induced by EMS in the range of 2.11 to 2.89 % in dry seed, 2.39 to 2.79 % in 3h presoaking and 2.64 to 3.10 % in 6h presoaking treatment mode. Treatment of gamma irradiation was found to be more effective than both the chemical mutagens, however, SA have more pronounced effect than EMS in inducing the chromosomal aberrations in PMCs and the aberrant cells. Effectiveness of both the chemical mutagens have increased with increase in presoaking of seeds in water for 3 and 6h. Precocious separation, single and multiple bridges, laggards and disturbed polarity were the frequently observed chromosomal aberrations. All the mutagens had adverse effect on pollen viability which was reduced to 50% at certain intances. Comparatively, gamma irradiation had more effectiveness than both the chemical mutagens, however, in case of chemical mutagens, SA was observed to be more effective than EMS. Increased period of pre-soaking of seeds in water, before the treatment of chemical mutagens, has enhanced effect on pollen viability. Potent effect of all the applied mutagens on meiotic chromosomes and the pollen viability clearly revealed that the genotype of the plant is highly sensitive to all the employed mutagens.

**Keywords:** Meiosis, aberrations, microsporogenesis, PMCs, sensitivity, mutagnes, *Rivinia humilis*

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*RESEARCH ARTICLE*

# Adsorption Studies of Co (II) from Aqueous Solution using *Mangifera indica* Bark Substrate

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**ABSTRACT:**
High concentration Co(II) in wastewater is highly toxic and responsible for various diseases to living beings. A very simple, eco-friendly and coast effective method for its removal is the use of *Mangifera indica* bark substrate. It is found to have good adsorption capacity. The studies shows that sorption of Co(II) increases with pH and found maximum at pH 5 for an optimum contact time of 60 minutes. The effect of concentration indicates that the bark substrate can remove Co(II) at lower concentration. The adsorption also increases with increasing doses of bark substrate. The presence of light metal ions in solution interfere with adsorption of Co (II) ions. The column study reported that about 60% of the metal ions remove instantaneously when passed through a packed column of bark substrate.

**KEYWORDS:** Cobalt metal ion, Cobalt removal, Spectrophotometric technique, bark substrate, water treatment, Mango bark.

## INTRODUCTION:

Water pollution is any physical or chemical change in water quality that can adversely affect living beings. Water pollution becomes a global problem that affects both the developed and developing countries. Heavy metals, acids, sediments, animal and human wastes, synthetic organic compounds etc. are potential pollutants discharged into water resources and lead to pollution[1].
The heavy metals are non biodegradable pollutants which accumulate and cause toxicity in humans, animals, microorganisms and plants[2].

The water resources contaminated by heavy metals due to discharge of industrial and mining effluents, anthropogenic activities etc. Heavy metals can cause health hazards to man and aquatic lives if their concentrations exceed allowable limits[3]. The safety limits for different heavy metals are given below.

**Table 1: Safety limits of toxic metals for Aquatic life**

| Sr. No. | Chemicals | Soluble ions not to exceed the conc. Given below in ppm |
|---|---|---|
| 1) | Zinc | 5.00 |
| 2) | Copper | 0.05 |
| 3) | Cadmium | 0.01 |
| 4) | Lead | 0.05 |
| 5) | Nickel | 0.10 |
| 6) | Iron | 0.30 |
| 7) | Trivalent Chromium | 1.00 |
| 8) | Hexavalent Chromium | 0.05 |
| 9) | Mercury | 0.005 |
| 10 | Arsenic | 0.05 |

The heavy metal contamination of water is a serious threat to life. The heavy metal toxicity results due to exposure from every part of day to day life such as

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Themed Section: Science and Technology

# Natural Polymer Used for Adsorption of Metal Ions from Aqueous Solution

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## ABSTRACT

In order to evaluate the problem of hazards on groundwater and to ascertain its suitability for drinking agriculture purposes in Bhandara district of Maharashtra. The quality of groundwater of any area is great importance for human being and irregation.All the groundwater irrespective of their source of origin certain mineral salt and their chemical properties. The kind of concentration of these constituents depends on various geological and physical factors. Since most of these factors are varying from place to place, the groundwater of any region each charactrize by mark difference in their chemical properties since the quality of water is directly or indirectly dependent upon its intended use. There is always a need to classify the water of an area on regional basis. [1]

Adsorption has been proved to be an excellent way to treat industrial waste effluents, offering significant advantages like the low-cost availability, profitability, ease of operation and efficiency comparative to activated carbon. The Tictona Grandis tree bark substrate was found to have good sorption capacity for Nickel. Studies indicate that the sorption of Pb (II) increases with the increase in pH value and contact time, 30minute was found to be optimum. The effect of concentration shows that the Tictona Grandis can remove Pb (II) ions from aqueous solutions, the concentration of metal ions increases adsorption decreases.

**Keywords :** Tictona Grandis tree bark substrate, Lead metal ion solution, pH meter, Spectrophotometer, Batch method, Lead nitrate, dimethylglyoxime solution, chloroform, separating funnel, shaking machine.

## I. INTRODUCTION

Salt of various metals and other potentially dangerous are being discharged in to the aquatic environment, water containing vital concentration of some of the heavy metal ions are harmful to human being, animal as well as aquatic organism. The toxicity of some heavy metal ions even at the trace level has been recognized with respect to public health for many years. Metals such as Mercury, Lead, Cadmium, Copper, Nickel and Chromium are under this category. Many metals have been evaluated as harmful to aquatic life above certain toxicity level. Many industries may have specific waste problem where the particular metal is an integral part of the many manufacturing process. Notable examples are the high zinc waste of viscosity Rayon manufacturing ground wood pulp production and News print production.

Thus, the material which cause pollution of environment are called pollutants. In other words, pollution is harmful solid, liquid or gaseous substance present in such a concentration in the environment, which tends to be injurious for the whole living Biota {2,3}. Contaminants can have different chemical characteristics and in a preliminary classification , they can roughly be divided into organic( E.g. pesticide, Herbicide, phenol, polycyclic, aromatic hydrocarbon) inorganic ( E.g. oxide of carbon, oxide of nitrogen) and different cations and metallic ( E.g. Cu, Cd , Pb, Ni, Co, Zn, Mn, Cr , Radioactive element and some rare earth) pollutants {4,5}

Pollution of the environment is one of the most

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# Scavenging of Toxic Metal Ions from Aqueous Solution by Using Column of Modified Magnifera Indica Tree Bark Substrate

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## ABSTRACT

The uncontrol growth of industrialisation in the world is responsible for change in chemical and biological properties of both surface and ground water which constitute a health hazard. The heavy metal render the water unsuitable for drinking and are highly toxic. Removal of these material is therefore essential.Meagre quantity of water which is available for human use is also getting contaminated because of industrialisation, urbanisation, population exodus.The major contaminants responsible for water pollution is as follows- Inorganic pollutants and toxic metals , sediments , oxygen demanding wastage , radioactive substances, thermal pollutants ,pesticides , farm waste and fertilizers, autoexhaust as water pollutants , organics ,synthetic detergents , disease causing agent , plant nutrient , biological pollutants(Nuisance , organism like algae etc and suspended matter ). The salt of various heavy metal and potentially hazardous material are being discharged in increasing amounts into the aquatic environment. Water containing significant concentration of some if the heavy metal ions are toxic to human being , animal as well as aquatic organism. The toxicity of some heavy metal ions even at the trace level has been recognized with respect to public health for many years . Metals such as Hg, Pb,Cd,Cu,and Cr fall under this category . Many metals have been evaluated as toxic to aquatic life above certain threshold toxicity level . Rapid industrialisation and technological development enhance the concentration of heavy metal poisoning posing a significant threat to the environment and public health because of their toxicity , accumulation in the food chain and persistance in nature . Industrial waste constitute the major source of various kind of metal pollution in natural water. The heavy metals are stable and persistant environmental contaminants . Since they can't be degraded and destroyed . The metal ions are harmful to aquatic life and water contaminated by toxic metal ions remains a serious health problems. The present study aimed at effective management and purification of industrial waste water using cheaper and locally available tree bark for removal of heavy metal and a substitute to conventional . The effect of tree bark on Potassium dichromate , Cobalt chloride ,on the metal contents on industrial waste water was investigated in the pH of 4-6 . It is observed that the process of uptake followed first order adsorption, rate , expression and obey langmuir and frendlich model of adsorotion.

**Keywords :** Powder of *Magnifera indica* tree bark substrate , Co(II) and Cr(VI) metal ion solution, ultraviolet spectrophotometer, pH meter , Shaking machine , column of 20 mm diameter.

## I. INTRODUCTION

Heavy metals generally occur in water in low concentration as a result of metal industries and partly through geological processes but these cause direct toxicity both to human and other living being due to their presence , obey the specified limits1.

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# Use of Column of Ferronia Elephuntum Fruit Shell Substrate for the Adsorption of Fe[Ii] and Mn[Ii] Metal Ion From Aqueous Solution

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## ABSTRACT

Meagre quantity of water, which is available for human use is also getting contaminated because of industrialisation, urbanisation and population exhaust. The major contaminants responsible for water pollution are as follows inorganic pollutant and toxic metals, sediments, oxygen demanding wastage , radioactive substances , thermal pollutants , pesticides form wastage and fertilizers auto exhaust as water pollutants , organics , synthetic detergents , diesease causing agents,plant nutrient, biological pollutant and suspended matter . Salt of various heavy metals and other potentially hazardous material are being discharged in increasing amounts into the aquatic environment. Water containing significant concentration of some of the heavy metal ion are toxic to human being , animals as well as aquatic organisms. The toxicity of some heavy metal ions even at the trace level as being recognised with respect to the public health for many years . Metal such as Hg, Pb, Cd, Cu, Cr fall under this categories. Many metals have been evaluated as toxic to aquatic life over certain threshold toxicity level. Exposure to heavy metal toxicity can result from every facet of natural activity such as agriculture , mining, transport energy and industry. Continue release of metal wastage into the environment has been justified on the basis of dilution to undetectable level or to the level below the threshold toxicity level in the receiving water body. The uncontrol growth of industrialisation in the world is responsible for change in chemical and biological properties of both surface and ground water which constitute a health hazard . The heavy metal renders the water unsuitable for a drinking and are also highly toxic . Removal of these naterials is therefore essential . The studies pertaining to the use of inexpensive agro based adsorbent such as tree bark , saw dust , corncob, straw , flyash and fruit shell etc fir heavy metal removal or gaining a lot of importance . In the present study the removal of Fe[II] and Mn[II] has been investigated using *Ferronia elephuntum* fruit shell substrate through pack column and results are obtained and are quite encouraging. The use of pack column has been investigated at the optimised condition , to study the feasibility of the process for application in small scale industries.

**Keywords :** *Ferronia elephuntum* fruit shell substrate, column of 2mm diameter ferrous ammonium sulphate solution, Maganese sulphate , Uv spectrophotometer.

## I. INTRODUCTION

The toxic heavy metals are released into the environment from a number of industries , such as mining , plating , dyeing, automobile maufacturing and metal processing. The presence of heavy metals processing. The presence of heavy metals in the environment has led to the number of environmental problem in order to meet the water quality standard for most of the countries , the concentration of heavy metals in waste water must be controlled.1. The heavy metal ions are stable and persistant environmental contaminants since they can't be degraded and destroyed. These metal ions are harmful

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# Study of Scavenging of Fe(II) on *Mangifera Indica* Bark Substrate

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**Abstract**

The adsorption properties of *Mangifera indica* bark substrate was investigated for removal of Fe(II) from wastewater in a batch equilibrium system. The effect of various parameters like pH, contact time, initial metal ion concentration, doses of bark substrate, temperature and presence of extra elements was investigated. The adsorption isotherm data fitted with Freundlich model. It is found to have good adsorption capacity for Fe(II) which is found maximum at pH 4 for optimum contact time of 70 minutes. The adsorption decreases with increased temperature so all experiments were carried out at room temperature. The adsorption increases with doses of bark substrate and decreases by the presence of light metal ions in the medium. The bark substrate was found to eco-friendly and coast effect adsorbent material for scavenging of Fe(II).

**Keywords:** Mango bark, Iron removal, bark substrate, water treatment, adsorption.

## 1. Introduction

Water is an essential component for life. The water pollution is increasing mainly due to discharge of wastewater from various industrial processes. The water pollution has been reduced by treatment of wastewater using many methods [1]. Water pollution adversely affects living beings. The pollutants mainly heavy metals, acids, sediments, animal and human wastes, synthetic organic compounds etc. discharged into water resources and show toxic effects [2].

The heavy metals are non biodegradable pollutants and their high concentration can cause health hazards to human being and aquatic lives if exceed allowable limits [3]. Iron is the second most abundant element in the earth crust and it is present in natural waters in the form of oxides. It is an essential element for human being as it present in hemoglobin and used for storage of oxygen in the body[4]. Although Iron is an essential element to life in small concentration, but at high concentration it may have detrimental effect [5]. The excessive amount of Fe(II) in water supplies causes turbidity, unpleasant taste and odour. Therefore, removal of Fe(II) become an important issue for aquatic environment[6].

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Original Articles

# Structural properties of $Cu_xNi_{1-x}Fe_2O_4$ nano ferrites prepared by urea-gel microwave auto combustion method

H. S. Ahamad ✉, N. S. Meshram, S. B. Bankar, S. J. Dhoble & K. G. Rewatkar

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## ABSTRACT

Copper-substituted nickel ferrite nanoparticles were prepared via a sol-gel route using urea as a chelating agent. The influence of copper concentration on the microstructure, crystal structure of copper-substituted nickel ferrite nanoparticles has been studied. The results indicate that the substitution of copper influences strongly the microstructure, crystal structure and particle diameter. Powder XRD confirmed single phase cubic structure. Morphology of the particles were studied and particle size was confirmed using SEM. Magnetic properties were studied using VSM method. The dielectric constant and the dielectric loss were increased as the temperature increased at a constant frequency. Dielectric constant (έ) is determined by measuring capacitance (C). Variations of dielectric constant (έ) with frequency as well as temperature have been studied.

**KEYWORDS:** Auto combustion SEM XRD spinel ferrites nickel ferrites substitution dielectric magnetic properties

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# ROLE OF LIBRARIANS IN PROMOTING EMERGING ICT ENVIRONMENT

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## ABSTRACT

*The paper focuses on the role played by librarians in promoting the emerging ICT environment to users who are unaware of the modern services in library. Librarians should provide or make available all required modern services to the users, reader's, research scholar, faculty members and students. This paper describes about varies consideration for designing suitable technology practices and services, analyzing the needs and requirements of users from time to time through appropriate method.*

## INTRODUCTION

The impact of Information and Communication Technology (ICT) is enormous and global in its magnitude. ICT profoundly affected library operations, information resources, services, staff skills requirements and user expectations. The proper exploitation of new technologies in library is no longer a matter of choice but a matter of survival in an era of rapidly changing technology global knowledge society. The versatility and power of ICT includes accommodation of increase workload, achievement of greater efficiency in improving existing services, ability for generation of new services, facilitating cooperation and in providing for an integrated approach without regard to format, location or medium through which it is served, "one stop information shopping" in the quest for quality and productivity in information services and products.

### Information and Communication Technology (ICT) Trend:-

ICT has been identified as a trending tool that can enhance multifaceted development globally. ICT concerned with storage, retrieval, manipulation, transmission or receipt of digital data. Importantly, it is focused with the ways these different uses can work with each other effectively and efficiently. ICT is a technology that transmits, stores, creates, displays,

02

# The Significance of National Digital Library in Development of Higher Education Academia

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**Abstract** – The traditional practice of library science is on the verge of digitization all over the world in general and in India in particular. The ever challenging call to update the academia of the institutions of higher education of India sought to the concept of Digital Literacy that lead to the conception of Digital Library, through the National Mission on Education through Information and Communication Technology. NMEICT under Ministry of Human Resource Development, Government of India, National Digital Library has been set up. The pilot project of NDL is a great epoch in mass education as it has been providing not only a vast repository of educational materials but metadata of the data being provided to the learners and researchers that likely to change the mode of education in India.

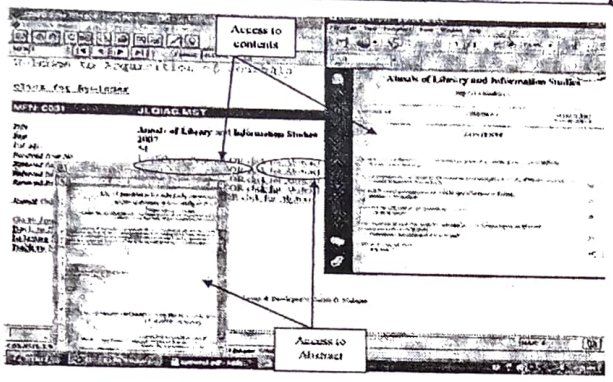
**Keywords** – library science, education, learners, researchers, data, metadata, NDL, NMEICT.

## I. INTRODUCTION

To emerge as a knowledge super power of the world in the shortest possible time it is imperative for India to convert our demographic advantage into knowledge powerhouse by nurturing and honing our working population into knowledge or knowledge enabled working population. Human Resource Development would certainly be the key for it to happen. The overall literacy rate in India, as per the 2001 census, was 64.8 percent. This implies that we do not even have the formal means to know about the talents of the remaining 35.2 percent of the population, let alone try to nurture their talents. This is a very high under-utilization of the nation's human resources. The issue of the education of the masses can be tacked effectively by implementing the modern concept of digital literacy through digital library.

## II. THE CONCEPT OF DIGITAL LIBRARY IN EDUCATION

For bridging the digital divide and empowering teachers /learners to harness the information and communication technology for their empowerment through knowledge, the need of the hour is to provide digital literacy to teaching learning community in Higher Education, to get connected and avail the knowledge network. The aim has to be that this community should be able to operate the computer or other communication devices and connect to the knowledge network. It should be for teacher and leaner as well to identify the content from its suitable pictorial representation and to play the audio-visual content to derive knowledge from the relevant module of knowledge. Obviously, this digital literacy cannot be spread through the computer networks since it aims to empower the teacher and learner as well to use the network. The digital literacy for teacher empowerment will have to be imparted through other means relying heavily on audio-visual material, non-governmental organizations, change agents and institutions established for them, and mass contact programs. The digital library is key to provide knowledge to the masses effectively with efficiency in an order to make them to be able to face the challenges of the demand of the ever updating and skilled work-force. Basic flow chart for steps for development for digital literacy is given as depicted in the diagram.




The above print screen of the CAPS module shows the actual view of the module displayed on the computer. It clearly shows the name of journal, year, volume number, issue number with links of contents page and abstract page. The user of the CAPS module has to click on the links to see the contents or the abstracts of the particular issues.

**References :**

1. UNESCO 2004, CDS/ISIS for Windows reference Manual (Version 1.5) : (This manual refers to Winisis 1.5 build 3), Information Society Division Sector of Communication and Information, UNESCO, New Zealand.

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# Green Library : Leading the Green Revolution

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**Abstract:-**

When confronted with a problem where the solution is not clear or obvious, first step would be to search for more information trying to make sense of the problem. The intention of this contribution is to make sense of the call for, "libraries to go green" while at the same time to show the potential of explicity considering information behaviour and the need to draw on full spectrum of information literary skills (e.g. recognising and expressing an information need, seeking using and disseminating) to stimulate librarian interest and confidence in taking on challenge of going green and making a difference.

**Introduction:-**

In today's era of technology green library is leading to green revolution. Green Library takes us near to the nature or green environment which we generally avoid or forget in our busy scheduled. For the purpose of this resources on "green" libraries, the 1st two E'- Economy & Ecology – will be considered. Libraries by their very nature are "green" in that their resources are shared by the larger community. But libraries can extend the environmental benefit further through both sustainable practices, which reduce the environmental impact of day-to-day operations and green buildings, which seek to minimize consumption of resources either in their building or their operation.

**GREEN LIBRARY:-**